SECTOR:HEALTHCARE

Student Workbook

CLASS X

PSSCIVE,Bhopal

PSS Central Institute of Vocational Education, Bhopal

(a constituent unit of NCERT, under Ministry of Human Resource Development, Government of India)

Sector: Healthcare

Job Role: Vision Technician

Student Workbook

Class X

Sector: Healthcare
Job Role: Vision Technician
Qualification Pack Reference ID: HSS-Q3001
Module Code: HSVT 201 to 206 NQ2017

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Student Details

Student Name:_____

Student Roll Number:_____

Batch Start Date:_____

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Preface

The student workbook is a part of the training package developed for the vocational subject under the National Vocational Education Qualification Framework (NVEQF)/National Skill Qualification Framework (NSQF), an initiative of Ministry of Human Resource Development (MHRD), Government of India. The NSQF sets common principles and guidelines for a nationally recognized qualification system covering Schools, Vocational Education and Training Institutions, Technical Education Institutions, Colleges and Universities. It is envisaged that the NSQF will promote transparency of qualifications, cross-sectoral learning, student-centred learning and facilitate learner's mobility between different qualifications, thus encouraging lifelong learning. The National Curriculum Framework, 2005 recommends that children's life at school must be linked to their life outside the school. This principle makes a departure from the legacy of bookish learning which continues to shape our system and causes a gap between the school, home, community and the workplace.

The Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE), a constituent of National Council of Educational Research and Training (NCERT) has developed modular curricula and learning materials for the vocational subjects offered from Classes IX to XII (NSQF Levels 1-4). This student workbook, which has been developed keeping in view the National Occupation Standards (NOSs) set by the Healthcare Sector Skill Council (HSSC) for the Job Role of Vision Technician is meant for students who have passed Class IX or equivalent examination. The National Occupation Standards are a set of competency standards used for recognizing and assessing skills and knowledge needed to perform effectively in the workplace.

The success of vocationalisation of education in schools depends on the steps that Principals and Teachers will take to encourage children to reflect their own learning and to pursue imaginative and on-the-job training activities. Participation of learners in skill development exercises and inculcation of values and creativity is possible if we involve children as participants in learning and not as receivers of information. Flexibility in the daily time-table would be a necessity to maintain the rigour in implementing the activities and the required number of teaching days will have to be increased for teaching vocational subjects.

The student workbook has been developed and reviewed by a group of experts and their contributions are admirably acknowledged. The utility of the workbook will be adjudged by the qualitative improvement that it brings about in teaching-learning. The likelihood of text errors, including typographical errors cannot be ruled out. The feedback and suggestions on the content by the teachers and other stakeholders will be of immense value to us in bringing about necessary improvement in the student workbook.

Acknowledgements

We acknowledge the contributions of the following persons in development and review of the content of the student workbooks:

- Dr. Vinay Swarup Mehrotra, Professor and Head, Curriculum Development and Evaluation Centre (CDEC) and National Skills Qualifications Cell (NSQFC), PSSCIVE, Bhopal for coordinating the development of curricula, student workbooks and teacher handbooks.

- Ms. Paramita Pal, Ms. Sukanya Mitra, Ms. Nisha Nair, Mr. Arkapabha Mukherjee, Ms. Shaonli Banerjee and Ms. Konica Paul Chakraborty as experts in healthcare sector for developing the content.

- Mr. Santanu Bhattacharjee and Ms. Juthika Sarkar, M/s Technable Solutions Pvt. Ltd., Kolkata as resource persons.

We are thankful to the Department of School Education and Literacy, Ministry of Human Resource Development, Government of India for financial support.

About Your Workbook

The student workbook contains sessions which will help you to acquire relevant knowledge and skills (generic and domain-specific skills) related to the job role. Each session is small enough to be easily tackled and digested by you before you move on to the next session. Animated pictures and photographs have been included to bring about visual appeal and to make the text lively and interactive for you. You can also try to create your own illustrations using your imagination or taking the help of your teacher.

Let us now see what the sections in the sessions have for you.

Section1: Introduction

This section introduces you to the topic of the Unit. It also tells you what you will learn through the various sessions covered in the Unit.

Section 2: Relevant Knowledge

This section provides you with the relevant information on the topic(s) covered in the session. The knowledge developed through this section will enable you to perform certain activities. You should read through the information to develop an understanding on the various aspects of the topic before you complete the exercise(s).

Section 3: Exercise

Each session has exercises, which you should complete on time. You will perform the activities in the classroom, at home or at the workplace. The activities included in this section will help you to develop necessary knowledge, skills and attitude that you need for becoming competent in performing the tasks at workplace. The activities should be done under the supervision of your teacher or trainer who will guide you in completing the tasks and also provide feedback to you for improving your performance.

Section 4: Assessment

The review questions included in this section will help you to check your progress. You must be able to answer all the questions before you proceed to the next session.

SECTOR: HEALTHCARE

HSVT 201-NQ2017 - Advance Computer Training

Student Workbook
(Class XI)

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Introduction

In this unit, you will learn about Windows and Linux Operating Systems, Microsoft Word (Basic), Microsoft Excel (Basic), and the procedures for installing and uninstalling software on computer.

An Operating System (OS) is a system software that manages computer hardware and software resources and provides common services for computer programmes. Application programmes usually require an operating system to function. Most software programmes are designed to work with just one company's operating system, like Windows (Microsoft) or Mac OS (Apple).Software developers also often release additional versions of their software that work with other operating systems.

The history of Windows dates back to September 1981, when Chase Bishop, a Computer Scientist, designed the first model of an electronic device and project Interface Manager was started. It was announced in November 1983 under the name "Windows", but Windows 1.0 was not released until November 1985.

Microsoft introduced an operating environment named Windows on November 20, 1985 as a graphical operating system shell for MS-DOS in response to the growing interest in Graphical User Interfaces (GUIs).

Microsoft Windows is a series of graphical interface operating systems developed, marketed and sold by Microsoft. The most popular operating systems today include versions of Microsoft Windows (like Windows 10, Windows 8, Windows 7, Windows Vista, and Windows XP).

In 1995, Windows 95 was released which only used MS-DOS as a bootstrap. Windows 95 facilitated hardware installation with plug and play. It also brought more colours, enhanced multimedia capabilities and TCP/IP network support. Direct X began to make Windows gaming possible for more demanding games.

Windows 98 improved speed and plug-and-play hardware support. USB support and quick launch made their first appearance. DOS gaming began to disappear as Windows gaming improved.

Windows XP was released as the first NT-based system with a version aimed squarely at the home user. The system improved Window's appearance with themes, and offered a stable platform. Windows XP can be said to have put an end to gaming in DOS. Direct X enabled features in 3D gaming that OpenGL had trouble keeping up with at times. XP offered the first Windows support for 64-bit computing. However, 64-bit computing was not very well supported in XP, and also lacked drivers or much software to run.

Windows Vista had interesting visual effects but was slow to start and run. The 32-bit version in particular did not enable enough RAM for the memory-hungry OS to operate quickly. Gamers found the added exclusive features in Direct X 10 only mildly tempting compared to XP's speed.

Windows 7 is built on the Vista kernel. Windows 7 had the visuals of Vista with better start up and programme speed. It was easier on memory and more reliable. To many end users, the biggest changes between Vista and Windows 7 are faster boot times, new user interfaces and the addition of Internet Explorer 8. The system plays games almost as well as XP. With true 64-bit support and an increasing separation in Direct X features that were not implemented in XP, that small performance difference benefit was further eroded. Windows 7 became the most used operating system on the Internet and also the most used for PC gaming.

Windows 8 takes better advantage of multi-core processing, Solid State Drives (SSD), touch screens and other alternate input methods. However, users found it awkward, like switching between an interface made for a touch screen and one made for a mouse.
Windows 10 was announced as the successor to Windows 8.1. It was released on July 29, 2015, and addresses shortcomings in the user interface first introduced with Windows 8. Changes include the Start Menu, a virtual desktop system, and the ability to run Windows Store apps within windows on the desktop rather than in full-screen mode.

Linux is an operating system. It is the software on a computer that enables applications and the computer operator to access the devices on the computer to perform desired functions. Linux was originally developed as a free operating system for personal computers based on the Intel x86 architecture, but has since been ported to more computer hardware platforms than any other operating system. Linux also runs on embedded systems, which are devices whose operating system is typically built into the firmware and is highly tailored to the system; this includes smart phones and tablet computers running Android and other Linux derivatives. Development of Linux is one of the most prominent examples of free and open-source software collaboration. The user interface, also known as the shell, is either a command-line interface (CLI), a graphical user interface (GUI), or through controls attached to the associated hardware, which is common for embedded systems. The primary difference between Linux and many other popular contemporary operating systems is that the Linux kernel and other components are free and open-source software.

Session 1: Applications of Windows 8 and Linux Operating System

In this session, you will learn about the various applications of Windows 8 and Linux operating system.

Relevant Knowledge

Windows 8 is the most significant operating system. Windows 8 was introduced with a number of new features across various aspects of the operating system. Among these included a greater focus on optimizing the operating system for touchscreen-based devices (such as tablets) and cloud computing.

A number of apps are included in the standard installation of Windows 8, including the following:

- Mail (an email client)
- People (a contact manager)
- Messaging (an IM client)
- Calendar (a calendaring app)
- Photos (an image viewer)
- Music (an audio player)
- Video (a video player)
- Camera (a webcam or digital camera client)
- SkyDrive
- Reader (an e-book reader), and six other apps that expose Bing services (Search, News, Finance, Weather, Travel and Sports).

Windows 8 also includes a Metro-style system component called PC Settings which exposes a small portion of Control Panel settings. Windows 8.1 improves this component to include more options that were previously exclusive to Control Panel.

Windows 8.1 has some added features, including Calculator, Alarm Clock, Sound Recorder, Reading List, Food & Drink, Health & Fitness and a File Manager integrated in the SkyDrive app.

Desktop: You can personalize the Desktop with different backgrounds, colours, and themes, and pin your favourite apps to the taskbar.

Mail: A web application that provides message management, composition, and reception functions.

Contact Manager: It is a software programme that enables users to easily store and finds contact information, such as names, addresses and telephone numbers.

Instant Messaging (IM): It is a type of online chat which offers real-time text transmission over the Internet.

Calendar: It is a time-management web application.

Image viewer: An image viewer or image browser is a computer programme that can display stored graphical images.

Xbox Music is a digital music service developed by Microsoft that offers music through ad-supported streaming, subscription streaming, and purchase through the Xbox Music Store.

Xbox Video: It is a digital video service developed by Microsoft that offers full HD films and TV shows available for rental or purchase in the Xbox Video Store.

Webcam: A webcam is a video camera that feeds or streams its image in real time to or through a computer to computer network.

OneDrive or SkyDrive: It is a file hosting service that allows users to upload and sync files to cloud storage and then access them from a Web browser or their local device.

Start screen: Itis where you can see and quickly get to your favourite apps, people, websites, folders, and other things that are important to you.

Search: The Search charm opens a full screen display that can be used to search through various sources, including Apps, Settings, Files, and content surfaced by apps.

User Login: Windows 8 features a new lock screen, which includes a date and time display, along with the ability to display notifications from apps.

Display Screen: Windows 8 includes improved support for multi-monitor configurations; the taskbar can now be shown on multiple displays, and each display can also show its own dedicated taskbar. Wallpapers can also be spanned across multiple displays, or each display can have its own separate wallpaper.

Linux

The popularity of Linux on standard desktop computers and laptops has been increasing over the years. Currently most distributions include a graphical user environment, with the two most popular environments being GNOME (which can utilize additional shells such as the default GNOME Shell and Ubuntu Unity), and the KDE Plasma Desktop.

No single official Linux desktop exist, rather the desktop environments and Linux distributions select components from a pool of free and open-source software with which they construct a GUI implementing some more or less strict design guide. GNOME, for example, has its human interface guidelines as a design guide, which gives the human–machine interface an important role, not just when doing the graphical design, but also when considering people with disabilities, and even when focusing on security.

GNOME is one of the oldest Linux desktop environments, and certainly one of the most popular. GNOME—specifically GNOME Shell, the most recent iteration of the platform—has been designed to be easy to use, modern looking and attractive, and easy to customize and personalize. The break between GNOME 2 and GNOME Shell) upset many users, with several preferring the flatter, classic look of the DE and others preferring the more modern and less dated look of the most recent iteration. In any case, GNOME Shell has all the features you would expect from a DE, including a customizable application launcher, a top menu and status bar, system-wide search in the form of Dash, a window, application, and file manager, a notifications tray, and more. It even has window "snapping," similar to Windows 7's Aero Snap, support for touch pads and multi-touch gestures, and many extensions and system add-ons, widgets, and shell themes.

Exercise

1. Make a chart showing various types of applications available in Windows 8
2. Make a presentation on the difference between Windows 8 and Linux
3. Make a presentation on Linux operating system.

Assessment

I. Short Answer Questions

1) Describe Mail app in Windows 8.

_____
_____
_____
_____

2) What is the difference between Xbox Music and Xbox Video?

_____
_____
_____
_____

3) What is the function of Webcam?

_____
_____
_____
_____

II. Fill in the blanks

1. Application programmes usually require an _____ system to function.
2. Windows XP was released as the first _____based system with a version aimed squarely at the home user.
3. Windows 7 is built on the _____ kernel.
4. Linux is an _____ system.
5. CLI stands for _____-Line Interface.
6. GUI stands for _____ User Interface.
7. Mail is a web application that provides _____ management, composition and reception functions.

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity:

Part – A

Differentiated between the following:

Windows and Linux Operating System

Part – B

Discussed in class the following:

1. What are the various security features of Windows 8?
2. What are the various security features of Linux?
3. How Windows OS differs from Linux?

Part – C

Performance Standards

The performance standards may include but not limited to:

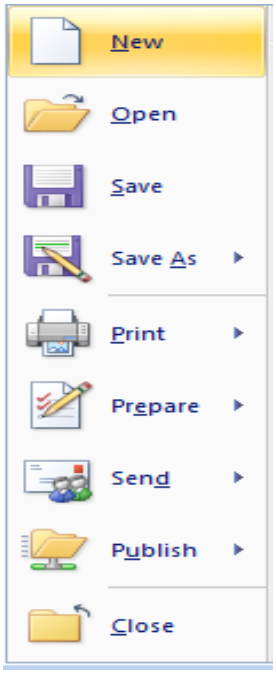
Performance Standards	**Yes**	**No**
Demonstrated the knowledge of using Windows 8		
Integrated a range of Windows 8 features into their learning activities		
Demonstrated the knowledge of key features of Linux OS		

Session 2: MS Word

In this session, you will learn about the application of various features and functions of MS Word.

Relevant Knowledge

MS WORD



Microsoft Word is the word processor component of Microsoft Office that allows users the ability to create and save documents. A word document can be a letter, report, or even a web page.

To Start Microsoft Word

Click on the Start button on the left side of the taskbar; then click Programmes; then click Microsoft Word.

Creating a Blank Document

Select New from under the File Menu.

A Blank document should appear on screen. If not, choose Blank from under the Task Pane on the right side of the page.

Formatting Text

To format font size:

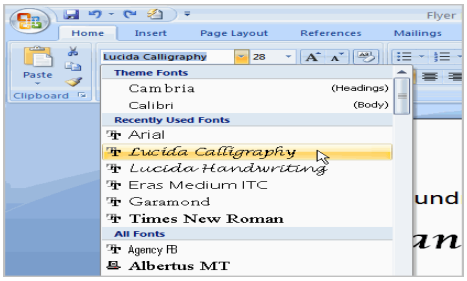
Select the text you want to modify.

Left-click the **drop-down arrow** next to the **font size box** on the Home tab. The font size drop-down menu appears.

Move your cursor over the various font sizes. A **live preview** of the font size will appear in the document.

Left-click the font size you want to use. The font size will change in the document.

To format font style:



Select the text you want to modify.

Left-click the **drop-down arrow** next to the **font style box** on the Home tab. The font style drop-down menu appears.

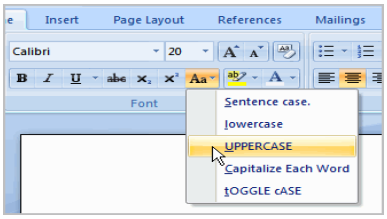
Move your cursor over the various font styles. A **live preview** of he font will appear in the document.

Left-click the font style you want to use. The font style will change in the document.

To use the bold, italic, and underline commands:

Select the text you want to modify.

Click the bold, italic, or underline command in the **Font group** on the Home tab.

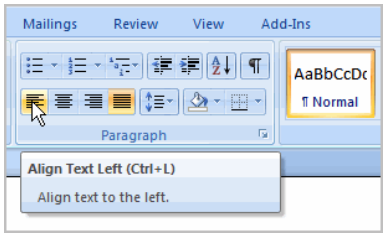


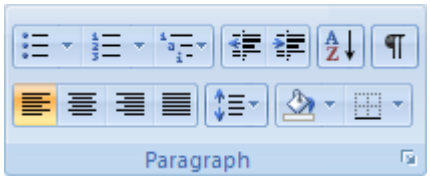
To change the text case:

Select the text you want to modify.

Click the **Change Case** command in the **Font** group on the Home tab.

Select one of the case options from the list.





To change text alignment:

Select the text you want to modify.

Select one of the four **alignment options** from the Paragraph group on the Home tab.

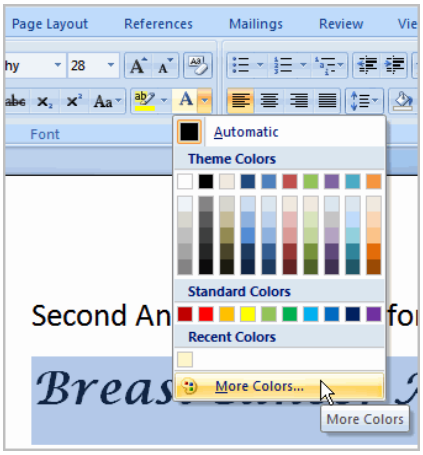
Align Text Left: Aligns all of the selected text to the left margin

Center: Aligns text an equal distance from the left and right margins

Align Text Right: Aligns all of the selected text to the right margin

Justify: Aligns text equally to the right and left margins; used in many books, newsletters, and newspapers

To format font color:



Select the text you want to modify.

Left-click the drop-down arrow next to the **font color box** on the Home tab. The font color menu appears.

Move your cursor over the various font colors. A live preview of the color will appear in the document.

Left-click the font color you want to use. The font color will change in the document.

Your color choices aren't limited to the drop-down menu that appears. Select **More Colors** at the bottom of the list to access the Colors dialog box. Choose the color you want, then click OK.

Creating WordArt

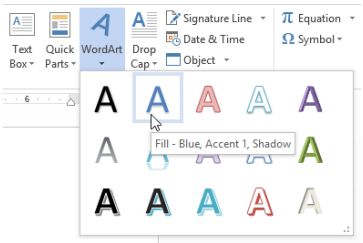
In addition to adding effects to a text box, you can add effects to the **text inside the text box**, which is known as **WordArt**.

To convert regular text into WordArt:

For text to be formatted as WordArt, it must be inside a **text box**. However, there is a shortcut that allows you to convert text into WordArt even if it's not in a text box.

Select the text you want to convert, then click the **Insert** tab.

Click the **WordArt** drop-down arrow in the **Text** group. A drop-down menu of WordArt styles will appear. Select the style you want to use.



Word will automatically create a text box for the text, and the text will appear in the selected style. If you want, you can change the **font** or **font colour** from the **Home** tab.

Insert a picture or clip art

Pictures and clip art can be inserted or copied into a document from many different sources, including downloaded from a clip art Web site provider, copied from a Web page, or inserted from a file where you save pictures.

You can also change how a picture or clip art is positioned with text within a document.

Insert clip art

On the **Insert** tab, in the **Illustrations** group, click **Clip Art**.

In the **Clip Art** task pane, in the **Search for** text box, type a word or phrase that describes the clip art that you want, or type in all or some of the file name of the clip art.

To narrow your search, do one or both of the following:

To limit the search results to a specific collection of clip art, in the **Search in** box, click the arrow and select the collection you want to search.

To limit the search results to clip art, click the arrow in the **Results should be** box and select the check box next to **Clip Art**.

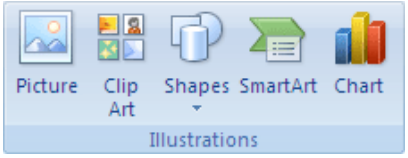
In the **Clip Art** task pane, you can also search for photographs, movies, and sounds. To include any of those media types, select the check boxes next to them.

Click **Go**.

In the list of results, click the clip art to insert it.

Adding SmartArt Graphic

A SmartArt graphic is a visual representation of your information that you can quickly and easily create, choosing from among many different layouts, to effectively communicate your message or ideas.

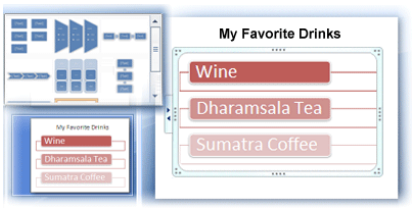


Create a SmartArt graphic and add text to it

On the **Insert** tab, in the **Illustrations** group, click **Smart Art**.

In the **Choose a SmartArt Graphic** dialog box, click the type and layout that you want.

Enter your text by doing one of the following:



Click **[Text]** in the Text pane, and then type your text.

Copy text from another location or program, click **[Text]** in the Text pane, and then paste your text.If the Text pane is not visible, click the control.

To add text in an arbitrary position close to or on top of your SmartArt graphic, on the **Insert** tab, in the **Text** group, click **Text Box** to insert a text box. If you want only the text in your text box to appear, right-click your text box, click **Format Shape** or **Format Text Box**, and then set the text box to have no background color and no border.

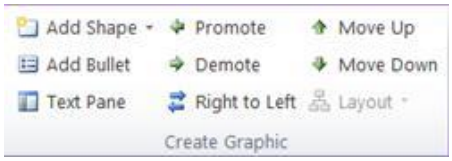
Click in a box in the SmartArt graphic, and then type your text. For best results, use this option after you add all of the boxes that you want.

Add or delete shapes in your SmartArt graphic

Click the SmartArt graphic that you want to add another shape to.

Click the existing shape that is located closest to where you want to add the new shape.

Under **SmartArt Tools**, on the **Design** tab, in the **Create Graphic** group, click the arrow under **Add Shape**.

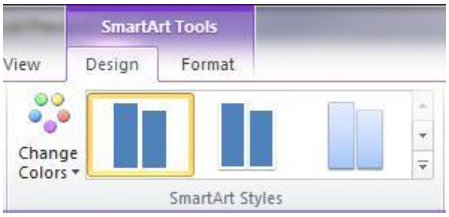


If you don't see the **SmartArt Tools** or **Design** tabs, make sure that you've selected the SmartArt graphic. You may have to double-click the SmartArt graphic to open the **Design** tab.

Do one of the following:

To insert a shape after the selected shape, click **Add Shape After**.

To insert a shape before the selected shape, click **Add Shape Before**.



Change the colors of an entire SmartArt graphic

You can apply color variations that are derived from the theme colors to the shapes in your SmartArt graphic.

Click your SmartArt graphic.
Under **SmartArt Tools**, on the **Design** tab, in the **SmartArt**

Styles group, click **Change Colors**

Align the text left or right

Select the text that you want to align.

On the **Home** tab, in the **Paragraph** group, click **Align Left** or **Align Right**

Center the text

Select the text that you want to center.

On the **Home** tab, in the **Paragraph** group, click **Center**

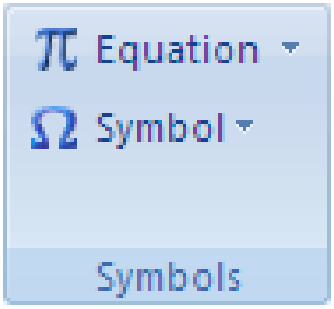
Justify the text

You can justify the text, which might make the last line of text in a paragraph considerably shorter than the other lines.

Select the text you want to justify.

On the **Home** tab, in the **Paragraph** group, click **Justify**

Inserting Symbols



In Microsoft Office Word 2007, you can insert mathematical symbols into equations.

On the **Insert** tab, in the **Symbols** group, click the arrow next to **Equations**, and then click **Insert New Equation**.

Under **Equation Tools**, on the **Design** tab, in the **Symbols** group, click the **More** arrow .

Click the arrow next to the name of the symbol set, and then click the name of the symbol set that you want to display.

Click the symbol that you want to insert.

Inset Page Borders

You can apply a simple line border or a more complex line style to your document. These line borders can give your document a professional appearance.

Click ***Box*** in the **Settings** section if it is not already selected. This will apply the border to the entire page. If you only want the border in a certain location, such as the top and the bottom of the pages, click ***Custom***.

Select a ***Line Style*** from the **Style** section in the middle of the screen
Scroll down through the list to view different line styles.
Select a ***Line Color*** from the **Color** drop-down menu.
Select a ***Line Width*** from the **Width** menu.
To customize where the border appears, click the appropriate button on the **Preview** section or click on the border itself on the **Preview** image. This toggles the border off and on.
Select which pages to apply the border to in the ***Apply To*** drop-down menu. While this list varies depending on what is in your document, common choices include Whole Document, This Page, Selected Section, and This Point Forward.
Click ***OK***. The line border is applied to your document.

Adding a New Table And/or Rows to a Word Document: Creating Tables (Method 1)

Select TABLE from the Menu bar.
Using the drop-down menu select Insert Table.
Fill in the Number of Columns field with the correct number for the table you want to create,
Fill in the Number of Rows field with the correct number for the table you want to create.
If you want each column to be a certain width, enter that width in the column width field. If you want the computer to determine how wide each column is, select AUTO in this field.
Click OK. A table should appear in your document and should be ready for you to complete with your information.

Creating Tables (Method 2)

Select the Insert Table icon on the toolbar (If your cursor is currently located within a table you will not be able to locate the Insert Table icon. If this happens move your cursor outside the table in your document).
Use your mouse to highlight the number of rows and columns you need in your table. The maximum table size is 5 columns by 4 rows. If you need a larger table use Method 1 above.
Press Enter.

Once you have created a table you can move among cells(blocks in a table) using either the Tab key (moves you left to right), the Shift+Tab key (moves you right to left) or the arrow keys. You may also use your mouse to click directly on a cell. You enter data in the table by typing just as you would in any document.

To add a row to the bottom of a table you have already created

Select the cell located at the lower right corner of your table (the last column of the last row) and then press the Tab key. If you want to add a row in the middle of a table you have already created:
Select any cell on the row just below where you want to add a new row.
Select Table from the menu bar.
Select Insert Rows from the drop-down menu and press enter.

To add a column to a table you have already created

Place your cursor anywhere in the column immediately to the right of where you want to insert a column.
Choose Table from the menu bar.
Choose Select Column from the drop-down menu.
Press enter.
Select Table from the menu bar.
Choose Insert Columns from the drop-down menu.
Press enter.

A new column should appear in your table.

To change the width of columns in a table you have already created

Select any cell in your table.
Select Table from the menu bar.
Choose Select Table from the drop-down menu.
Press enter.
Select Table from the menu bar again.
Choose Cell Height and Width from the drop-down menu.
Press enter.
Select the tab labelled Column.
Enter a number in the Width of Columns field.
Click on OK.
All of your columns will now be the same specified width
(For example, if you enter 1, each column will be 1 inch wide).

If you want columns to be different widths

Place your cursor anywhere in the column you want to change.
Select Table from the menu bar.
Choose Select Column from the drop-down menu.
Press enter.
Select Table from the menu bar.
Choose Cell Height and Width from the drop-down menu.
Press enter.
Select the tab labelled Column and enters the desired width in the Width of Column field.
Click OK.

There is an alternate method of changing width of columns. You can also change the width of columns by placing your cursor on the line between two columns. While doing this the width indicator will appear. You can then left-click and drag your mouse to change the width of columns.

Click anywhere on your table.
Select Table from the menu bar.
Choose Sort from the drop-down menu.
Press enter.
Select the heading of the column you wish to use in sorting your table.
Choose whether you are sorting text or numbers.
Choose whether you wish to sort in ascending or descending order.
If you wish to sort by a second column choose that column heading in the Then By field. You then choose text or number and ascending or descending for this secondary sort.
If your table has heading in the first row you should select Header Row so that row will not be sorted.
Click OK

You can delete rows or columns

Select any cell in the row or column you wish to delete.
Select Table from the menu bar.
Choose Select Row or Select Column from the drop-down menu.
Press enter.
Select Table from the menu bar again.
Choose Delete Row or Delete Column from the drop-down menu.
Press enter.

Set Page Orientation

Change the orientation of your entire document

On the **Page Layout** tab, in the **Page Setup** group, click **Orientation**.

Click **Portrait** or **Landscape**.

Use portrait and landscape orientation in the same document

Select the pages or paragraphs that you want to change to portrait or landscape orientation.

On the **Page Layout** tab, in the **Page Setup** group, click **Margins**.

Click **Custom Margins**.

On the **Margins** tab, click **Portrait** or **Landscape**.

In the **Apply to** list, click **Selected text**.

Insert Header and Footer

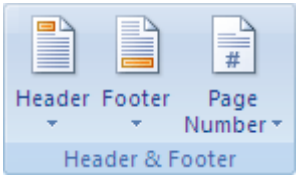
Insert a predefined header or footer

On the **Insert** tab, in the **Header & Footer** group, click **Header** or **Footer**.

Click the header or footer design that you want.

The header or footer is inserted on every page of the document.

Insert a Page Number



If your document already has content in the header or footer, you can add the page number to the header or footer.

If you want to use one of the preformatted page number designs, but you want more information in the header or footer than just the page number, it is easiest to start with a page number and then add other text or graphics to the header or footer.

Add a page number to an existing header or footer

Double-click the header or footer area.

Position the cursor where you want to insert the page number.

On the **Insert** tab, in the **Header & Footer** group, click **Page Number**.

Click **Current Position**.

Choose a page number design from the gallery of designs.

Insert Charts

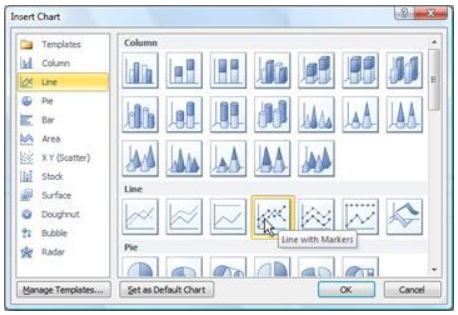
On the **Insert** tab, in the **Illustrations** group, click **Chart**.

In the **Insert Chart** dialog box, click the arrows to scroll through the chart types.

Select the type of chart that you want and then click **OK**.

When you rest the mouse pointer over any chart type, a ScreenTip displays its name.

When you are finished editing your data, you can close Excel.



Modify Line Spacing

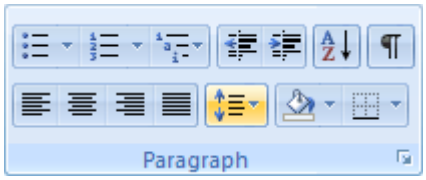
Change the line spacing in an existing document

The easiest way to change the line spacing for an entire document is to apply a Quick Style set that uses the spacing that you want. If you want to change the line spacing for a portion of the document, you can select the paragraphs and change their line spacing settings.

Use a style set to change line spacing for an entire document

On the **Home** tab, in the **Styles** group, click **Change Styles**.

Point to **Style Set**, and point to the various style sets. Using the live preview, notice how the line spacing changes from one style set to the next.



For example, the Traditional and Word 2003 style sets use single-spacing. The Manuscript style set uses double spacing.

When you see spacing that you like, click the name of the style set.

Change the line spacing in a portion of the document

Select the paragraphs for which you want to change the line spacing.

On the **Home** tab, in the **Paragraph** group, click **Line Spacing**.

Do one of the following:

Click the number of line spaces that you want.

For example, click **2.0**, to double-space the selected paragraph. Click **1.0** to single-space with the spacing that is used in earlier versions of Word. Click **1.15** to single-space with the spacing that is used in Word 2007.

Click **Line Spacing Options**, and then select the options that you want under **Spacing**. See the following list of available options for more information.

Line spacing options

Single: This option accommodates the largest font in that line, plus a small amount of extra space. The amount of extra space varies depending on the font that is used.

1.5 lines: This option is one-and-one-half times that of single line spacing.

Double: This option is twice that of single line spacing.

At least: This option sets the minimum line spacing that is needed to fit the largest font or graphic on the line.

Exactly: This option sets fixed line spacing, expressed in points. For example, if the text is in a 10-point font, you can specify 12 points as the line spacing.

Multiple: This option sets line spacing that can be expressed in numbers greater than 1. For example, setting line spacing to 1.15 will increase the space by 15 percent, and setting line spacing to 3 increases the space by 300 percent (triple spacing).

Change the spacing before or after paragraphs

The easiest way to change the spacing between paragraphs for an entire document is to apply a Quick Style set that uses the spacing that you want. If you want to change the spacing between paragraphs for a portion of the document, you can select the paragraphs and change their spacing-before and spacing-after settings.

Use a style set to change paragraph spacing for an entire document

On the **Home** tab, in the **Styles** group, click **Change Styles**..

Point to **Style Set**, and point to the various style sets. Using the live preview, notice how the line spacing changes from one style set to the next.

For example, the Word 2003 style set inserts no extra space between paragraphs and a small amount of space above headings. The Word 2007 style set uses a double space between paragraphs and adds more space above headings.

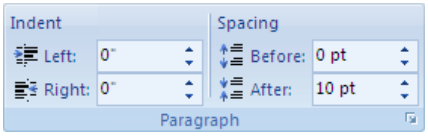
When you see spacing that you like, click the name of the style set.

Change the spacing before and after selected paragraphs

By default, paragraphs are followed by a blank line, and headings have extra space above them.

Select the paragraph before or after which you want to change the spacing.

On the **Page Layout** tab, in the **Paragraph** group, click an arrow next to **Spacing Before** or **Spacing After** and enter the amount of space that you want.



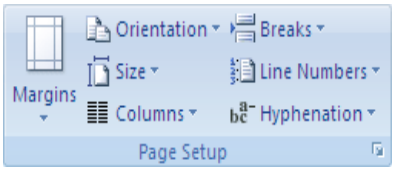
Set the default to single-spacing for all new documents

On the **Home** tab, in the **Styles** group, click **Change Styles**..

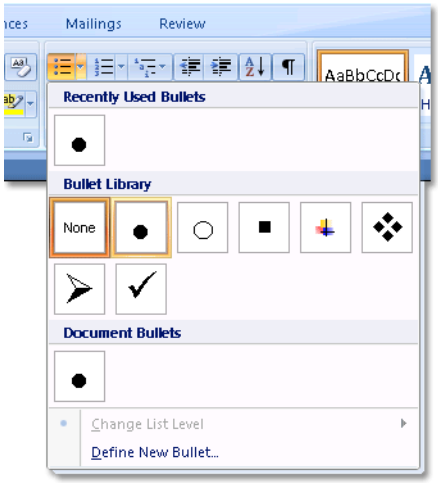
Point to **Style Set**, and click **Word 2003**.

Create a bulleted or numbered list

You can quickly add bullets or numbers to existing lines of text, or Word can automatically create lists as you type.



By default, if you start a paragraph with an asterisk or a number **1.**, Word recognizes that you are trying to start a bulleted or numbered list. If you don't want your text turned into a list, you can click the **AutoCorrect Options** button  that appears.



Lists: One level or many levels

Make a list with just one level, or make a multilevel list to show lists within a list.

When you create a bulleted or numbered list, you can do any of the following:

Use the convenient Bullet and Numbering libraries

Use the default bullet and numbering formats for lists, customize the lists, or select other formats from the Bullet and Numbering libraries.

Format bullets or numbers: Format bullets or numbers differently from the text in a list. For example, click a number and change the number color for the entire list, without making changes to the text in the list.

Use pictures or symbols: Create a picture bulleted list to add visual interest to a document or a Web page.

Create a one-level bulleted or numbered list

Word can automatically create bulleted and numbered lists as you type, or you can quickly add bullets or numbers to existing lines of text.

Add bullets or numbering to a list

Select the items that you want to add bullets or numbering to.

On the **Home** tab, in the **Paragraph** group, click **Bullets** or **Numbering**.

Checking for spelling and grammatical mistakes

Spell checking is a unique facility in MS Word.
When you have typed your document, select Tools from the menu bar.

Choose Spelling and Grammar from the drop-down menu.
The computer will alert you to spelling or grammatical mistakes within your document. You may either Skip the reported problems or elect to replace the reported problem with the computer's suggestion or with some other change by entering it in the suggestion field.

Saving a Word Document

To save a new document, select File from the menu bar.
Choose Save from the drop-down menu.
Select the location to which you wish to save the document from the drop-down menu at the top of the save box.
Enter the name of the document you are saving. This will be the way you identify the document on your computer or disk.
Select the type of file you are saving from the drop-down menu at the bottom of the save box. This will usually be Word Document.
Click Save.

Printing a document

Select File from the menu bar.
Choose Print from the drop-down menu.
Select the printer that you are printing to from the drop-down menu.
Select whether you want to print the entire document, only the current page, selected pages (ex. 3-8 or 3, 4, 10 will print pages 3 through 9 or pages 3, 5 and 9), or a portion of the text you have highlighted.
Select how many copies you want to print.
Click OK.

Inkjet Printer and Laser Printer

Getting Help in Microsoft Word

Microsoft Word users can find the help button (?) at the top right hand corner of the application. and keyboard shortcut for accessing help is **F1**

The option to choose Online or Offline help can be done by clicking down the arrow available below **Word Help**.

Go to computer laboratory of your school and open MS Word. Create a table and name it. Enter data depicting your activities from Monday through Saturday. Write the days in the first column and activities along the header row. Do not forget to save the file.

On next day open the same file and insert one more row for Sunday. Start inserting data in all the cells. If you feel, change the row length or column heights. You may like to 'wrap' any text. Carry out spell checking.

Assessment

Short Answer Questions

Write the steps for the following:

(a) Inserting a row in the table

_____
_____
_____

(b) Inserting a column in the table

_____
_____
_____
_____

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity.

Part – A

Differentiated between the following:

1. Inserting a row and inserting a column in a table
2. Copy-paste and cut-paste
3. Page break and section break

Part B

Discussed in class the following:

1. How to insert a page?
2. How to insert page and section break?
3. Why should we use print preview before printing a document?

Part - C

Performance Standards

The performance standards may include, but not limited to:

Performance Standards	Yes	No
Demonstrated the skill of using different commands for editing a document on MS Word		
Demonstrated the skill of using select, copy, paste, delete and save commands in MS Word		

Session 3: MS Excel

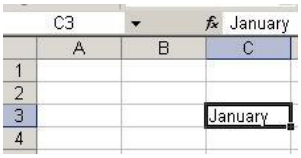
In this session, you will learn about MS Excel.

Relevant Knowledge

Microsoft Excel (MS Excel) allows versatile facilities for work related to mathematics, statistics, basic calculations, etc. If the software has been installed on your desktop, you will see an icon of MS Excel.

If you do not find that then follow the steps:

Click Start>Programmes>Microsoft Office>Microsoft Excel 2010

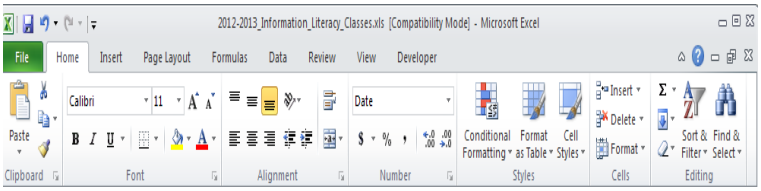


The Ribbon- seen across the top of Microsoft Excel. The ribbon contains Tabs, Groups, and Commands

Tabs - sit across the top of the ribbon. Each tab contains core tasks you do in the programme (Home, Insert, Page Layout etc.)

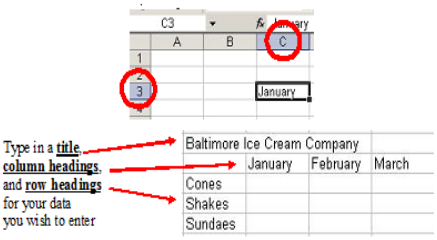
Groups - sets of related commands displayed in the tabs. (Clipboard, Font, Alignment, Number, Styles etc.)

Commands - a button, menu, or a box where you enter information. View the figure below.



Each square on the worksheet is called a cell. Enter (type) your data into each cell. Its location is determined by the column letter and row number. In the example below, January is typed in cell "C3". After you enter the date, press the Enter key on your keyboard. So, Excel accepts what you typed.View the figure on the left side.

Type in a title, column headings, and row headings for your data you wish to enter.See the figure below for clarity as an example.



Formulas are used to calculate cells. All formulas must begin with an equals (=) sign. Also, when creating formulas, use the cell location, not what is in the cell to create your formula.

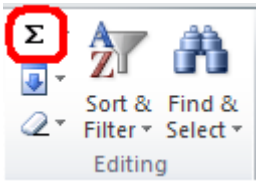
a. Example: **=C4+D4+E4**

	A	B	C	D	E	F
1						
2		Baltimore Ice Cream Company				
3			January	February	March	Total
4		Cones	450	550	800	1800
5		Shakes	125	240	355	
6		Sundaes	295	450	490	

b. After you type in the formula, press the [Enter] key on your keyboard. The formula will be replaced by the result in that cell.

	A	B	C	D	E	F
1						
2		Baltimore Ice Cream Company				
3			January	February	March	Total
4		Cones	450	550	800	1800
5		Shakes	125	240	355	
6		Sundaes	295	450	490	

Functions are prewritten formulas. The most common functions are **Sum**, **Average**, **Minimum**, and **Maximum**. To Sum (add up cells), click on the cell you wish to place the function. On the toolbar, click on the AutoSum button.



You will notice a marquee around some cells that Excel thinks you want to add. If Excel guesses correctly, just press the [Enter] key. If Excel does not guess the correct cells you want to add, click and drag over the cells you want and then press the [Enter] key.

Baltimore Ice Cream Company					
	January	February	March	Total	Average
Cones	450	550	800	=SUM(C4:E4)	
Shakes	125	240	355	SUM(number1, [numb	
Sundaes	295	450	490		

To find the **Average**, **Minimum**, or **Maximum**, click on the cell you wish to place the function. On the toolbar, click the little drop down arrow next to the AutoSum button. Select the function by clicking on it.

You will notice a marquee around some cells that Excel thinks you want to use. If Excel guesses correctly, just press the [Enter] key. If Excel does not guess the correct cells you want, drag over the cells you want and then press the [Enter] key.

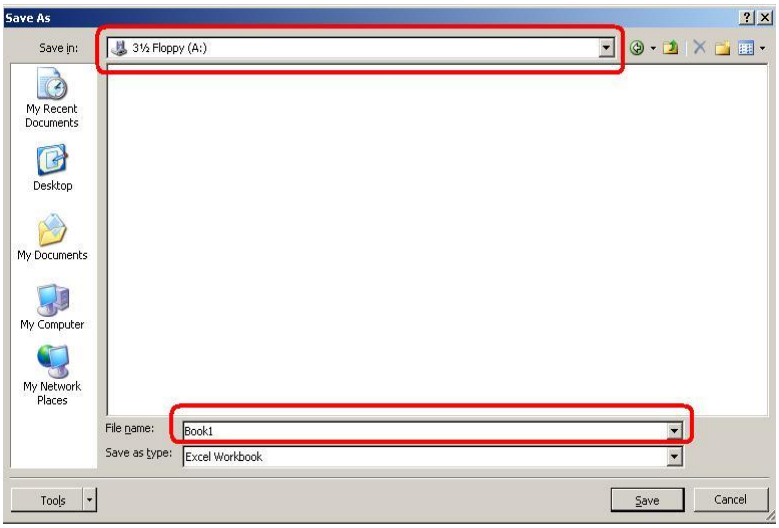
Save your workbook. Save early, save often! Once you type in some data, it is a good time to save your work. When you save your work, you need to tell Excel where to save the file and what to name it.

Click the **File Tab** located on the upper left corner.

i. Select **Save As**
ii. The **Save As Dialog Box** appears

Change the **Save in** box to the location where you wish to save your document (3 ½ inch Floppy drive, a Flash drive...)
In the **File Name** Box, type in the name of your document
Click the **Save** button

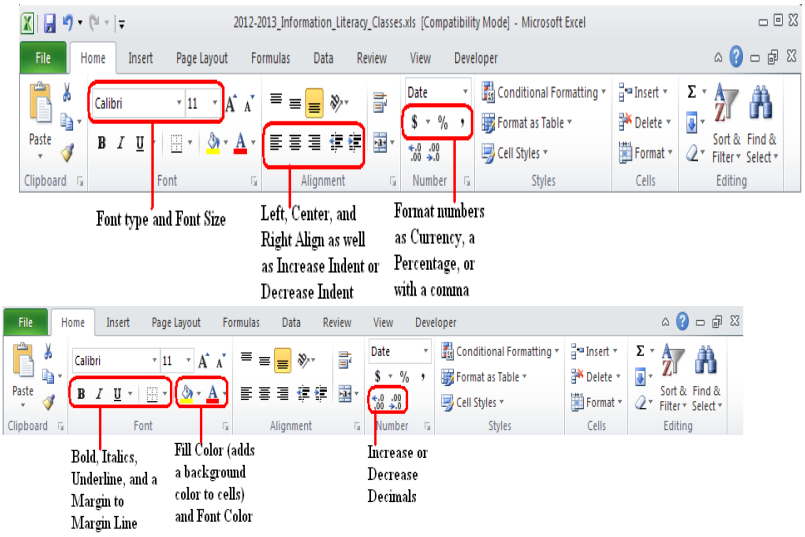
Then give the workbook a name. Microsoft may offer you a suggested name. You can delete it and type in any name you wish.

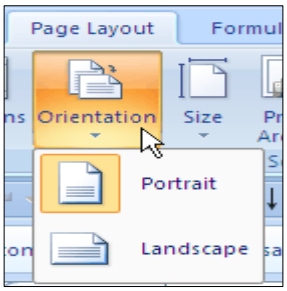


Then click the **Save** button.

Formatting Cells

Formatting cells allows you to change the size, colour, alignment, and font type you want. Select the cells and click the appropriate button.





Set Page Orientation:

To change page orientation in Excel 2007 follow the steps given below:

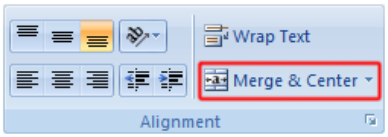
Switch to the Page Layout tab.
In the Page Setup group click Orientation.

Select the required orientation (Portrait or Landscape) from the options shown.

Merging of the Cells:

Merging cells is often used when a title is to be centred over a particular section of a spreadsheet. When a group of cells is merged, only the text in the upper-leftmost box is preserved.

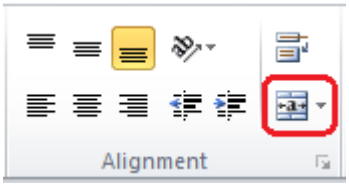
Excel XP and Excel 2003



To merge a group of cells:

Highlight or select a range of cells.
Right-click on the highlighted cells and select Format Cells.
Click the Alignment tab and place a checkmark in the checkbox labelled Merge cells.

Excel 2007

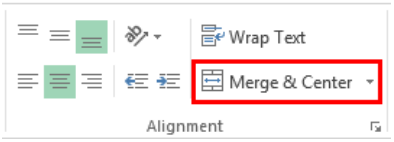


To merge a group of cells and centre the text, you can also use the **Merge and Centre** button on the Excel tool bar. Again, this will only preserve the text in the upper-leftmost cell.

Highlight or select a range of cells.

Click the Merge and Centre button on the toolbar.

Excel 2010



Excel XP and Excel 2003, Excel 2007,Excel 2010,Excel 2013

Insert blank cells on a Worksheet

Select the cell or the range of cells where you want to insert the new blank cells. Select the same number of cells as you want to insert. For example, to insert five blank cells, select five cells.

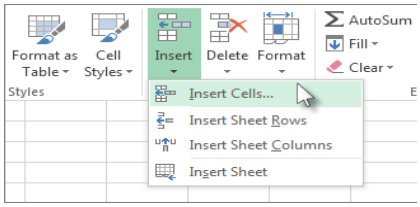
To cancel a selection of cells, click any cell on the worksheet.

For more information about making selections, see Select cells, ranges, rows, or columns later in this topic.

Do one of the following:

Right-click the selected cells and then click **Insert**.

On the **Home** tab, in the **Cells** group, click the arrow below to **Insert**, and then click **Insert Cells**.



In the **Insert** dialog box, click the direction in which you want to shift the surrounding cells.

When you insert cells on a worksheet, the references adjust accordingly, whether they are relative or absolute cell references. The same behaviour applies to deleting cells, except when a deleted cell is directly referenced by a formula. If you want references to adjust automatically, it's a good idea to use range references when you can in your formulas, instead of specifying individual cells.

You can insert cells that contain data and formulas by copying or cutting the cells, right-clicking the location where you want to paste them, and then clicking **Insert Copied Cells** or **Insert Cut Cells**.

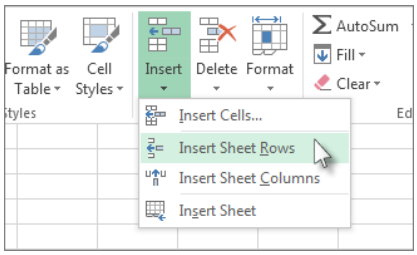
Insert rows on worksheet

Do one of the following:

To insert a single row, select either the whole row or a cell in the row above which you want to insert the new row. For example, to insert a new row above row 5, click a cell in row 5.

To insert multiple rows, select the rows above which you want to insert rows. Select the same number of rows as you want to insert. For example, to insert three new rows, you select three rows.

To insert nonadjacent rows, hold down Ctrl while you select nonadjacent rows.



To cancel a selection of cells, click any cell on the worksheet.

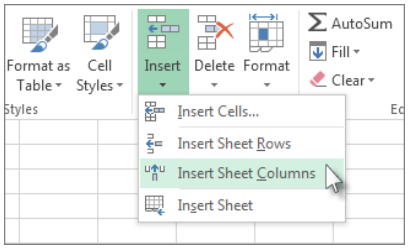
For more information about making selections, see Select cells, ranges, rows, or columns later in this topic.

Do one of the following:

Right-click the selected cells and then click **Insert**.

On the **Home** tab, in the **Cells** group, click the arrow under **Insert**, and then click **Insert Sheet Rows**.

Insert column on worksheet



Do one of the following:

To insert a single column, select the column or a cell in the column immediately to the right of where you want to insert the new column. For example, to insert a new column to the left of column B, click a cell in column B.

To insert multiple columns, select the columns immediately to the right of where you want to insert columns. Select the same

number of columns as you want to insert. For example, to insert three new columns, you select three columns.

To insert nonadjacent columns, hold down Ctrl while you select nonadjacent columns.

To cancel a selection of cells, click any cell on the worksheet.

For more information about making selections, see Select cells, ranges, rows, or columns later in this topic.

Do one of the following:

Right-click the selected cells and then click **Insert**

On the **Home** tab, in the **Cells** group, click the arrow under **Insert**, and then click **Insert Sheet Columns**.

Delete cells, rows, and columns

To cancel a selection of cells, click any cell on the worksheet.

For more information about making selections, see Select cells, ranges, rows, or columns later in this topic.

On the **Home** tab, in the **Cells** group, click the arrow next to **Delete**, and then do one of the following:

To delete selected cells, click **Delete Cells**.

To delete selected rows, click **Delete Sheet Rows**.

To delete selected columns, click **Delete Sheet Columns**.

You can right-click a selection of cells, click **Delete**, and then click the option that you want. You can also right-click a selection of rows or columns and then click **Delete**.

If you are deleting a cell or a range of cells, in the **Delete** dialog box, click **Shift cells left**, **Shift cells up**, **Entire row**, or **Entire column**.

If you are deleting rows or columns, other rows or columns automatically shift up or to the left.

Tips

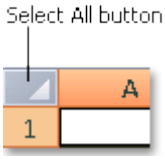
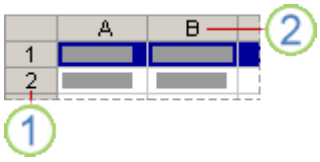
To repeat deleting cells, rows, or columns, select the next cells, rows, or columns, and then press Ctrl+Y.

If needed, you can restore deleted data immediately after you delete it. On the **Quick Access Toolbar**, click **Undo Delete**, or press Ctrl+Z.

Pressing the Delete key deletes the contents of the selected cells only, not the cells themselves.

Excel keeps formulas up to date by adjusting references to the shifted cells to reflect their new locations. However, a formula that refers to a deleted cell displays the #REF! Error value.

Select cells, range, rows or columns

To select	Do this
A single cell	Click the cell, or press the arrow keys to move to the cell.
A range of cells	Click the first cell in the range, and then drag to the last cell, or hold down Shift while you press the arrow keys to extend the selection. You can also select the first cell in the range, and then press F8 to extend the selection by using the arrow keys. To stop extending the selection, press F8 again.
A large range of cells	Click the first cell in the range, and then hold down Shift while you click the last cell in the range. You can scroll to make the last cell visible.
All cells on a worksheet	Click the **Select All** button.  To select the whole worksheet, you can also press Ctrl+A. If the worksheet contains data, Ctrl +A selects the current selects the whole worksheet.
Nonadjacent cells or cell ranges	Select the first cell or range of cells, and then hold down C cells or ranges. You can also select the first cell or range of cells, and then nonadjacent cell or range to the selection. To stop adding press Shift+F8 again. You can't cancel the selection of a cell or range of cells in canceling the whole selection.
A whole row or column	Click the row or column heading.  Row heading 2. Column heading

	You can also select cells in a row or column by selecting the first Ctrl+Shift+Arrow key (Right Arrow or Left Arrow for rows, Up Arro columns). If the row or column contains data, Ctrl+Shift+Arrow key selects t last used cell. Pressing Ctrl+Shift+Arrow key again selects the wh
Adjacent rows or columns	Drag across the row or column headings. Or select the first row o Shift while you select the last row or column.
Nonadjacent rows or columns	Click the column or row heading of the first row or column in you down Ctrl while you click the column or row headings of other ro want to add to the selection.
The first or last cell in a row or column	Select a cell in the row or column, and then press Ctrl+Arrow key (Arrow for rows, Up Arrow or Down Arrow for columns).
The first or last cell on a worksheet or in a Microsoft Office Excel table	Press Ctrl+Home to select the first cell on the worksheet or in an Press Ctrl+End to select the last cell on the worksheet or in an Ex or formatting.
Cells to the last used cell on the worksheet (lower-right corner)	Select the first cell, and then press Ctrl+Shift+End to extend the used cell on the worksheet (lower-right corner).
Cells to the beginning of the worksheet	Select the first cell, and then press Ctrl+Shift+Home to extend th beginning of the worksheet.
More or fewer cells than the active selection	Hold down Shift while you click the last cell that you want to incl The rectangular range between the active cell and the cell that y selection.

ii. Design Text

TEXT function

The **TEXT** function lets you change the way a number appears by applying formatting to it with **format codes**. It's useful in situations where you want to display numbers in a more readable format, or you want to combine numbers with text or symbols.

Syntax

TEXT(value, format text)
The **TEXT** function syntax has the following arguments:

Argument Name	Description
value	A numeric value that you want to be converted into text.
Format text	A text string that defines the formatting that you want to be ap

Overview

In its simplest form, the TEXT function says:

=TEXT(Value you want to format, "Format code you want to apply")

Here are some popular examples, which you can copy directly into Excel to experiment with on your own. Notice the format codes within quotation marks.

Formula	Description
=TEXT(1234.567,"**$#,##0.00**")	Currency with a thousands separator and 2 decimals, like $1,234.57. Note that Excel rounds the value to 2 decimal places.
=TEXT(TODAY(),"**MM/DD/YY**")	Today's date in MM/DD/YY format, like 03/14/12
=TEXT(TODAY(),"**DDDD**")	Today's day of the week, like Monday
=TEXT(NOW(),"**H:MM AM/PM**")	Current time, like 1:29 PM
=TEXT(0.285,"**0.0%**")	Percentage, like 28.5%
=TEXT(4.34 ,"**# ?/?**")	Fraction, like 4 1/3
=TRIM(TEXT(0.34,"**# ?/?**"))	Fraction, like 1/3. Note this uses the TRIM function to remove the leadi with a decimal value.
=TEXT(12200000,"**0.00E+00**")	Scientific notation, like 1.22E+07
=TEXT(1234567898,"**[<=9999999]###-####;(###) ###-####**")	Special (Phone number), like (123) 456-7898
=TEXT(1234,"**0000000**")	Add leading zeros (0), like 0001234
=TEXT(123456,"**##0° 00' 00""**")	Custom - Latitude/Longitude

Insert symbol

Click where you want to insert the symbol.

On the **Insert** tab, in the **Symbols** group, click **Symbol**.

Do one of the following:

Click the symbol that you want in the drop-down list.

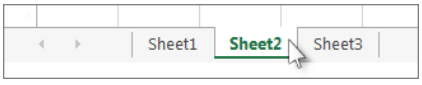
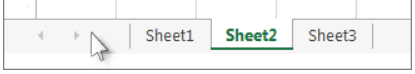
If the symbol that you want to insert is not in the list, click **More Symbols**. In the **Font** box, click the font that you want, click the symbol that you want to insert, and then click **Insert**.

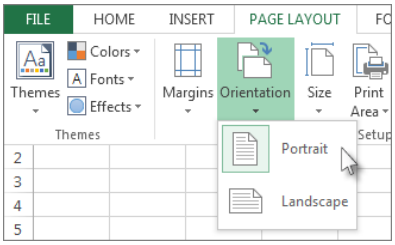
Click **Close**.

Change the page orientation

Select the worksheet or worksheets for which you want to change the orientation.

How to select worksheets

To select	Do this
A single sheet	Click the sheet tab.  If w to display the tab, and then click the 



Two or more adjacent sheets	Click the tab for the first sheet. Then hc tab for the last sheet that you want to s
Two or more nonadjacent sheets	Click the tab for the first sheet. Then hc tabs of the other sheets that you want t
All sheets in a workbook	Right-click a sheet tab, and then click S

On the **Page Layout** tab, in the **Page Setup** group, click **Orientation**, and then click **Portrait** or **Landscape**.

Change the page orientation when you are ready to print
Select the worksheet, worksheets, or worksheet data that you want to print.

Click the **File** tab.

Click **Print**.

Keyboard shortcut You can also press Ctrl+P.

In the **Page Orientation** drop-down box, under **Settings**, click **Portrait Orientation** or **Landscape Orientation**.

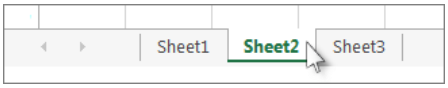
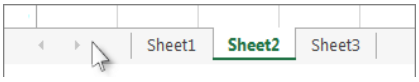
When you are ready to print, click **Print**.

Create a template that uses landscape orientation by default
To save time, you can save a workbook configured to print in landscape orientation as a template. You can then use this template to create other workbooks.
Create the template

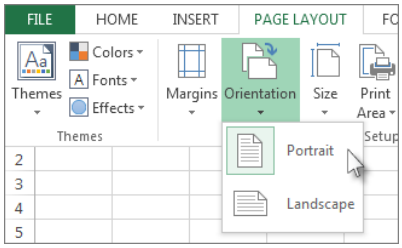
Create a workbook.

Select the worksheet or worksheets for which you want to change the orientation.

How to select worksheets

To select	Do this
A single sheet	Click the sheet tab.  If you don't see the tab that you want, click the tab scrolling buttons to display the tab, and then click the tab. 
Two or more adjacent sheets	Click the tab for the first sheet. Then hold down Shift while you click the tab for the last sheet that you want to select.
Two or more nonadjacent sheets	Click the tab for the first sheet. Then hold down Ctrl while you click the tabs of the other sheets that

	you want to select.
All sheets in a workbook	Right-click a sheet tab, and then click **Select All Sheets**.



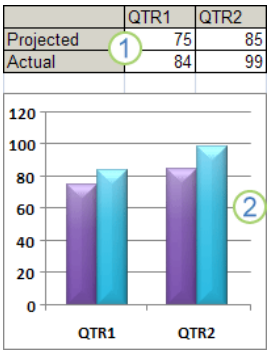
On the **Page Layout** tab, in the **Page Setup** group, click **Orientation**, and then click **Landscape**.

Make charts

Create a chart from start to finish

Microsoft Excel no longer provides the chart wizard. Instead, you can create a basic chart by selecting any part of the range you want to be charted, then clicking the chart type that you want on the **Insert** tab in the **Charts** group. You can then continue with the next steps of the following step-by-step process.

Learn about charts



Charts are used to display series of numeric data in a graphical format to make it easier to understand large quantities of data and the relationship between different series of data.

To create a chart in Excel, you start by entering the numeric data for the chart on a worksheet. Then you can plot that data into a chart by selecting the chart type that you want to use on the **Insert** tab, in the **Charts** group.

1. Worksheet data
2. Chart created from worksheet data

Excel supports many types of charts to help you display data in ways that are meaningful to your audience. When you create a chart or change an existing chart, you can select from a variety of chart types (such as a column chart or a pie chart) and their subtypes (such as a stacked column chart or a pie in 3-D chart). You can also create a combination chart by using more than one chart type in your chart.

Add a chart title

Click anywhere in the chart to which you want to add a title.

This displays the **Chart Tools**, adding the **Design**, **Layout**, and **Format** tabs.

On the **Layout** tab, in the **Labels** group, click **Chart Title**.

Use Multiple sheets

Select one or multiple worksheets

By clicking the tabs of worksheets (or sheets) at the bottom of the window, you can quickly select a different sheet. If you want to enter or edit data on several worksheets at the same time, you can

group worksheets by selecting multiple sheets. You can also format or print a selection of sheets at the same time.

To select	Do this
A single sheet	Click the sheet tab.  If you don't see the tab that you want, click tl the tab, and then click the tab. 
Two or more adjacent sheets	Click the tab for the first sheet. Then hold do the last sheet that you want to select.
Two or more nonadjacent sheets	Click the tab for the first sheet. Then hold do the other sheets that you want to select.
All sheets in a workbook	Right-click a sheet tab, and then click **Select**

Filter in Excel

AutoFilter is a quick and simple way to filter through that information and find what you need. Starting with inputting data, you will need to select and sort it and customize the auto filter. This 5-step process can increase your efficacy and speed.

Input all your data or open the spreadsheet that contains your data. It is best if your data has column heading, such as categories to specify the data below it. If you donot have these, input them before you filter.

Select all the data you wish to filter. Because the AutoFilter option is an automatic process that does not receive any specific inputs on how to filter, it is recommended that you choose 'all' of the data you have. This will avoid the possibility that you lose data associations across rows and/or columns.

Click “Data”, then select “Filter”.
You will immediately notice that the categories have drop-down buttons. Using these buttons, you can set your filter options.

Sorting

Microsoft Excel is a great tool for sorting and keeping your information in an organized fashion. Here is a guide for sorting your rows of information alphabetically.

Open Microsoft Excel.

Locate the column that you want to sort, and make sure the title of each column is in bold otherwise excel will sort it too.

Click the header on the top of the Column of data you wish to sort. (Headers are A - B - C - D - E - etc. for columns and are Numbers for rows)

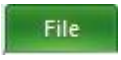
In the toolbar you will find two buttons that contain the letters A + Z.

Click the icon with A on top and Z on the bottom to sort your data in an Ascending format (A first, Z last).

Click the icon with Z on top and A on the bottom to sort your data in a Descending format (Z first, A last).

Printing

Click **Print**
The **Print Dialog Box** appears
The **Print Range** should be set to **All** pages
The **Copies** should be set to **1**
You can use the spin box to change the number of copies
Click the **OK** button.



Exit Excel - You can still lose your work if you do not exit properly. To close the Excel application:

Click the tab, and then select **Exit.**

i. If you have not saved your work, you will be asked if you want to save it – Click **YES** and save your work.

Exercise

Develop a database for 30 students studying in the Class. The database must include the following data: Name, Father's Name, Mother's Name, Address, Date of Birth, Marks obtained in all Subjects in Class IX final examination and she told you to keep provision for 4 more data. Write the steps to create the database in the classroom and then create the database on the computer.

_____
_____
_____
_____
_____
_____
_____
_____

Assessment

Fill in the blanks

1. Each square on the worksheet is called a _____.
2. _____ are prewritten formulas.
3. The most common _____ in MS Excel are Sum, Average, Minimum, and Maximum.
4. _____ cells allow you to change the size, colour, alignment, and font type you want.

5. To merge a group of cells and centre the text, you can also use the _____and Centre button on the Excel tool bar.

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity:

Part - A

Differentiated between the following:

1. Formula and function
2. Filter and sorting

Part - B

Discussed in class the following:

1. What are the advantages of pre-written formulae or functions in MS Excel?
2. What are the uses of MS Excel?
3. How often a file should be saved?

Part C

Performance Standards

The performance standards may include, but not limited to:

Performance Standards	Yes	No
Demonstrated the skill of using basic functions of MS Excel		
Performed basic calculations using MS Excel		

Session 4: Installation and Uninstallation of Software

In this session, you will learn about the installation and uninstallation process of software on computer.

Relevant Knowledge

The installation process for software depends on your operating system and the programme that you are installing.

Microsoft Windows Users

General Tips

Make sure your computer meets the system requirements of the programme, game or utility that you are going to install.

The manual or the readme file contain exact instructions on how to install a programme and are in the same directory as the installation files.

When installing a programme, utility, or game, it is always a good idea to close or disable any other programmes that is running.

After installing a new programme if it prompts you to reboot the computer, do it.

Autorun from a CD or DVD

Many software programmes, games, and utilities have an AutoPlay feature. This feature automatically starts a setup screen for the software programme when inserting a CD or DVD. If your programme contains this feature, follow the steps that appear after inserting the disc.

No Autorun Feature

Open My Computer.

Within the My Computer window, open the drive that contains the installation files. For example, if the files are on the CD-ROM drive open the D: drive or letter of your CD-ROM drive.

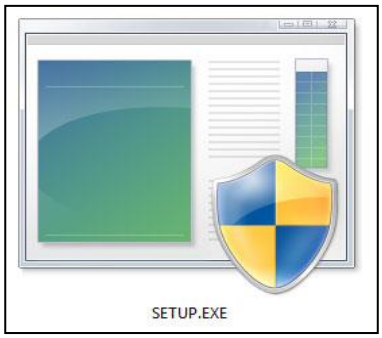
Within the drive that contains your files, locate either the executable **setup** or **install** file. Double-clicking on this file starts the installation process. If you see multiple setup or install files, try to locate the **Application** file or double-click each of the setup or install files until you find the file that starts the installation. Many a times, the icons associated with the installation files have the same name.

Alternate method for starting installation in Microsoft Windows

Click **Start** and **Run**.

In the Run Window, type **x:\setup** or **x:\install** where x is the letter of the install drive.

Installing from a Download



If the file you downloaded is an executable, click the icon twice in rapid succession to start the setup process. If the downloaded file is compressed (e.g..zip) you must extract the file's contents before setup can begin. Fortunately, this function is build into later versions of Windows.

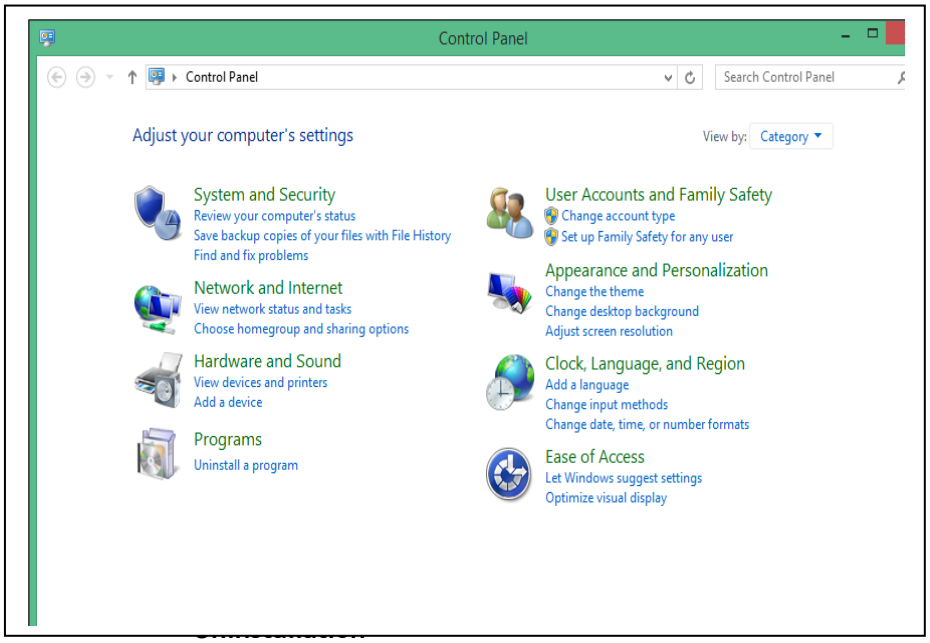
Once the files are extracted, double click the setup to install.

MS-DOS Users

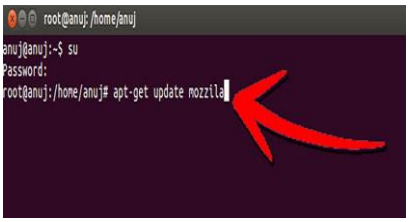
Users installing a programme from Microsoft DOS should have a basic understanding of the MS-DOS commands.

Before installing a programme in MS-DOS, you must switch to the drive or directory that contains the installation files. If you are installing a programme from a CD or diskette, switch to that drive. If the installation files are located in a different directory, use the dir command to list the directories and the cd command to switch into the appropriate directory.

Once you are in the directory or drive that contains the installation files, run the executable for setup. Many times this can be done by typing **setup** or **install** at the prompt to start the installation. If both of these commands give a *bad command or file name* error message, type **dir *.exe** or **dir *.com** or **dir *.bat**. These commands list any executable files; if any files are listed, execute these files to run the installation or setup of the programme. If no files are listed when typing all three of the above commands, you are in the incorrect directory or drive letter for that programme.



Steps of uninstallation of software in Windows 8

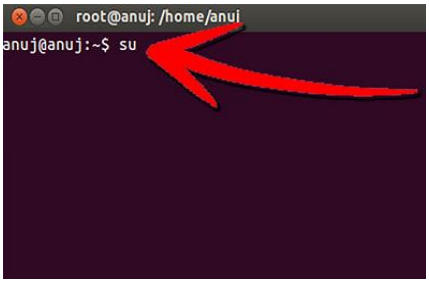


Go to control panel from the desktop short cart and open it.

Click on Programmes 'Uninstall a programme'.

'Programmes and Features' named window will open.

Select a programme that you want to remove from your computer system.

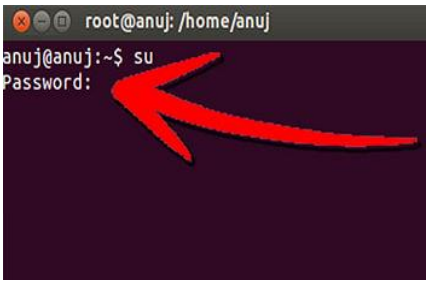


Above bar one tab will reflect as 'Uninstall/Change', beside 'Organize'.

One window will open, if you sure then click OK.

The software will remove from the system, and the computer should be restart.

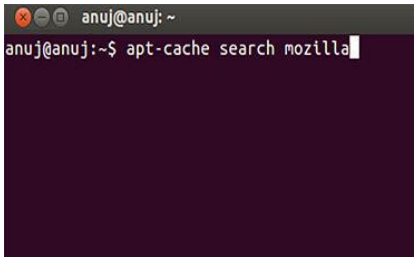
Steps of installing software in Linux Operating System:



We can install software graphically or using the command line in the Linux OS.

Software is bundled in packages which can be downloaded from repositories (repos).

Installation tools are called package managers which automatically resolve dependencies on other software libraries in Linux.



Following are the steps for installing software in Linux OS:

Open a root shell/terminal.

Type the root password (in Ubuntu prefix the following commands with sudo, in MEPIS or Aptosid, first become root by typing su).

To update the package lists type apt-get update

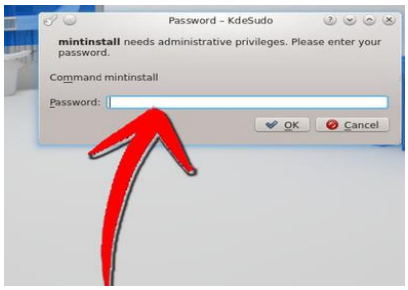
To search for a package type apt-cache search followed by a keyword such as spreadsheet.

Type apt-get install "programme name".

Confirm by pressing Y. You are done.

Following are the steps for uninstalling a software from Programme Menu from the Linux Mint OS.

Click Menu. Go to the applications you want to remove. Right click on the unwanted software and select Uninstall.



Type your password and press Authenticate when asked.

Look for the message that says, "the following packages will be removed." Click Remove.

Wait for the programmes to be removed. This can take some time.

Exercise

Install an antivirus in your computer (open source antivirus). Write down the steps you followed for its installation and also the problems that faced by you during the installation of the software.

Assessment

Fill in the blanks

1. The installation process for software depends on your operating system and the programme that you are installing.
2. Many software programmes has an _____ feature for auto installation.
3. A zipped file has _____ extension.
4. An executable file has _____ extension.
5. Installation tools are called _____managers which automatically resolve dependencies on other software libraries in Linux.

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity.

Part - A

Differentiated between the following:

1. Installation and uninstallation of a software
2. Antivirus and antimalware

Part - B

Discussed in class the following:

Installation of anti-virus in Linux and Windows Operating System

Part - C

Performance Standards

The performance standards may include, but not limited to:

Performance Standards	**Yes**	**No**
Demonstrated the procedure for installing a software		
Demonstrated the procedure for uninstalling a software		

SECTOR: HEALTHCARE

HSVT202-NQ2017-Communication at Workplace

Student Workbook
(Class XI)

Table of Contents

Introduction

Meaning of Communication

Communication is the ability to express and interpret thoughts, feelings and facts in oral and written form. It is also a means of interacting linguistically in an appropriate way in a range of societal, cultural and work context. It is the use of messages to produce meaning within and across a variety of contexts, cultures, methods and media. It is an important way through which facts, ideas, experiences and feelings are shared and exchanged.

Primates and other animals have been communicating without the use of language since long before humans invented verbal communication. Humans communicate both verbally and non-verbally. Verbal communication includes written and oral communication, whereas non-verbal communication includes body language, facial expression and pictures. Written communication is an effective tool for recording, reporting and management. The recording and reporting of information should be done in a systematic way. Our own beliefs, values and behavior interact with each other and it reflects in our style of communication.

Communication has three important parts – transmitting, listening and feedback. The sender transmits the message through one medium or another. The receiver listens to the message and then conveys his understanding of the message to the sender in the form of feedback to complete the communication cycle. The process of conveying a message is complete only when the person receiving it has understood the message in its entirety.

Communicating in an effective manner, irrespective of the mode of communication used is a skill. Effective communication occurs only if the receiver understands the exact information or idea that the sender intended to transmit. It involves the use of proper equipment, providing information to the appropriate people and carrying out communication effectively.

Breakdown in communication is either due to lack of skills in communicating or lack of coherent thought process. It can also happen due to the breakdown of the communication network.

In this Unit, you will learn about (i) greeting people and introducing yourself to people; (ii) frame sentences for describing people, things and places, (iii) describing weather, (iv) make sentences to express likes and dislikes, and (v) pronounce words properly.

Session 1: Greeting People and Giving Self Introduction

In this session, you will learn how to greet people and introduce yourself to people.

Relevant Knowledge

Every interaction starts with some form of greeting. The way we greet, the tone and the language changes according to our familiarity with the person being greeted. When you greet someone on phone then your tone matters a lot, but when you greet someone in person then your body language, smile, eye contact and the firm handshake matters a lot of difference. Let us now learn how we greet a friend, acquaintances and strangers. Some of the statements we generally make whenever we greet someone.

Greeting a friend:

1. Hello! How are you doing?
2. It has been a long time since we last met!
3. Hello! How are you doing now?
4. How‘s life?

Greeting an acquaintance:

1. Hello! How are you?
2. Hello! How have you been?
3. Good morning/afternoon/evening! All‘s well?

Greeting a stranger:

1. Hello!
2. Good morning/afternoon/evening!
3. How do you do?
4. My name is Aarti. May I know your name?

Talking about Family

A family is made up of relations and some of our relations are Father, Mother, Sister, Brother, Grandfather, Grandmother, Uncle, Aunt, and Cousin.

Introducing One Self

Introducing yourself to a stranger is an opportunity to make an impressive and long lasting impression. You can make a good use of such opportunity. Convey your name, what do you do, what are your hobbies, etc. Check the following commonly used

1. “I would like to introduce myself. I am…”
2. “Hi/Hello, I am...”
3. “Hi/Hello! My name is…”
4. “Hi/Hello! My name is…but you can call me…”
5. “I live at…”
6. “I am from...”
7. “I am working as a …”
8. “I am a …”

9. "I studied at…"
10. "I am/came here to…"
11. "My hobbies are…"
12. "I like…"

Exercise

Activity: Role Play

Objective: This activity will be facilitated by your teacher or trainer. At the end of this activity, you will be able to greet friends, neighbours and strangers confidently. The following 3 situations may be used for a role play:

Situation 1: You have met a friend after a long time. The last time you saw him was in school. **How would you greet each other**?

Situation 2: You meet your local grocer while you are taking your morning walk. **You ask him if his shop will be open today**.

Situation 3: You see a person come down the stairs of your building. You have not seen him before, but you guess that the person may be your new neighbour.
You greet him and introduce yourself.

Practice making simple sentences using the Third Person Singular rule. For example:

☐ I/You **take** English classes.
☐ S/he **takes** English classes.

Introducing Oneself

Read aloud the following sentences:

1. My name **is** _____ (include your name). And you **are**?
2. It **is** a pleasure to meet you.
3. Her name **is** Nisha. And the two men she **is** talking to **is** Manoj and Rahul.
4. He **is** an Auto mechanic. He **works** at XYZ workshop.

Read this:

1. I **have** a dog.
2. Do you **have** a dog?
3. We **have** a dog.
4. He **has** a dog.

Making Sentences: Talking About Family

Make simple sentences using the third person singular rule. For example:

1. I have a brother and a sister.
2. My parents work at the same office.
3. My grandmother and grandfather live with us.
4. My Aunt teaches at a school.

Assessment

A. Fill in the blanks with the correct option.

1. Hi! I ___ Priya.

(a) is (b) am (c) are

2. _____ am 21 years old.

(a) He (b) I (c) She

3. I _____ in Delhi.

(a) live (b) lives

4. There _____ six members in my family.

(a) is (b) are (c) was

5. My parents _____ me very much.

(a) loves (b) love

6. My brothers _____ working.

(a) is (b) am (c) are

7. My father _____ a farmer.

(a) is (b) am (c) are

8. My mother _____ a housewife.

(a) are (b) is (c) am

9. I _____ one sister.

(a) has (b) have (c) having

10. She _____ a student.

(a) is (b) am (c) are

B. Fill in the blanks with the correct option.

1. Hello, Sir! How _____ you?

(a) is (b) are (c) am

2. One of the best ways to greet a stranger _____ a simple "Hello!"

(a) is (b) are (c) has

3. Both Meena and Reena _____ people nicely.

(a) greets (b) greet (c) greeting

4. One of those girls who _____ at the office said "Hi" to me.

(a) works (b) work (c) working

5. If it is morning, you can _____ "Good morning" as a form of greeting.

(a) says (b) say (c) saying

6. One of my favourite ways of greeting people _____ "What's up?"

(a) is (b) are (c) being

7. The Japanese way of saying goodbye _____ "Sayonara".

(a) is (b) are (c) being

8. Bon jour ____ what the French _____ to greet someone.

(a) is, says (b) are, say (c) is, say

9. No form of greeting ____ as popular as ―Hello!

(a) is (b) are (c) has

10. Neither Preety nor Kirti _____ Ritu when they meet her.

(a) wishes (b) wish (c) wishing

B. Tick the correct sentence

1. I **wish** my neighbour every morning.
2. He **wish** me back.
3. I **ask** him how he is doing.
4. He **say** that he is doing well.
5. Then we **goes** to the Mother Dairy booth to buy milk.
6. We **talk** about the day's news.
7. We **walk** back and **says**―byeǁ to each other.

C. Making Sentences:

(i) Talking About Family

Fill in the blanks with the correct option:

1. Saumya _____ a Punjabi.
   a. is
   b. are
2. She _____ in Ambala.
   a. lives
   b. live
3. Her father and her mother _____teachers.
   a. is
   b. are
4. Her grandmother _____ with them.
   a. live
   b. lives
5. Her sister _____ to college
   a. go
   b. goes
6. Her brother _____ a carpenter.
   a. am
   b. is
7. He _____ in Delhi.
   a. work
   b. works
8. Saumya _____ to join the Army.
   a. wants

b. want

9. Her father _____ in the army for 3 years.
   a. are
   b. was
10. Saumya ____ to her brother every week.
   a) speak
   b) speaks

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity.

Part – A

Differentiated between the following:

Greeting a friend and greeting a stranger

Part – B

Discussed in class the following:

1. How to introduce yourself in different situations?
2. How to greet people?
3. Different ways to describe one's family?

Part - C

Performance Standards

The performance standards may include, but not limited to:

Performance Standards	**Yes**	**No**
Demonstrated the skill of introducing self		
Demonstrated the skill of greeting strangers and friends		
Framed sentences to describe family members		

Session 2: Framing Sentences

In this session, you will learn how to frame sentences to describe different situations. At the end of this session you will also learn how to describe things.

Relevant Knowledge

Look at the following sentences:

I **greet** you every day. You **greet** me every day. He **greets** me every day.

We **greet** you good morning. You all greet us good morning. They greet us good morning.

Do you see any change in the two sets of sentences?

There is a rule which is the reason behind the change:

Making Sentences

For any subject (name of a person, place or thing) that is in the **third person** and **singular** (Ram, Rita, he, she, it, Delhi, bus, chair, etc.), the verb will take an "s" or "es" after it.

When making sentences follow some simple rules. For example, write short sentences and paragraphs, capitalize the first letter of each sentence, be clean in your message, write to the point, be concise in communicating your message and provide a complete response.

Examples of Sentences

1. Ram meets new people every day.
2. He works as a sales person.
3. Delhi gets rain in the month of July and August.
4. The bus goes to Munirka.
5. The chair makes a noise when you sit on it.

For every other subject – first and second person, singular or plural, and **third person plural** (Ram and Rita, they, Delhi and Bombay, buses, chairs, etc.) – the rule will not apply.
I **meet** new people every day.

1. We **meet** new people every day.
2. You **meet** new people every day.
3. You all **meet** new people every day.
4. Ram and Rita **meet** new people every day.

While framingquestions, the sentences may begin with questions;

Examples:

Which student was absent yesterday?
Is he present today?
Did he bring his leave report today?
Read aloud the following sentences:

1. I am Mina.
2. My name is Mina.
3. I am from Delhi.
4. I am here to meet a friend.
5. I came by bus.
6. Yes, I am an Indian.
7. No, I will not shop with my friend.
8. Yes, I have called her up.

Study the list of 'Question Words' given below:

Word	Example
What	1. What are you doing tonight? 2. What are we having for dinner?
When	1. When is the match starting? 2. When are we leaving?
Where	1. Where is my diary? 2. Where will the World Cup be held this year?
Which	1. Which one is your book? 2. Which colour should we buy?
Who	1. Who is that girl? 2. Who stole the cell-phone?
Whom	1. With whom did you go to see the movie? 2. Whom did you meet at the party?
Whose	1. Whose towel is this? 2. Whose dog is barking this late at night?
Why	1. Why didn't you do your homework? 2. Why are we visiting her?
How	1. How are we going to tell him about the situation? 2. How is the book that you are reading?
Are	1. Are you Akanksha's sister? 2. Are you going to see him again?
Is	1. Is she doing her homework? 2. Is Manisha ill?
Am	1. Am I really going to take that chance? 2. Am I happy?
Have	1. Have you seen the new movie? 2. Have I done the right thing?
Has	1. Has she completed her shift? 2. Has it started boiling?
Do	1. Do we need to confirm the time and place? 2. Do you have to go to the bank today?
Does	1. Does he ever knock before entering a room? 2. Does the cat often steal from your kitchen?
Can/Could	1. Can I go to the mall? 2. Could you give me that magazine? 3. Can you play chess?
Will/Would	1. Will you be there on my wedding? 2. Will my book be published? 3. Would you sing if they ask you to?
Shall/Should	1. Shall we go now? 2. Shall I do the job for you? 3. Should you leave early to reach on time?

May	1. May I come in? 2. May I go out for a moment?

Read the following sentences:

1. Oh I am late already…**what** is the time?
2. Excuse me…**can** you please tell me the time?
3. Hey! **What** time does the movie start?
4. **When** do we have to meet Mr D'Souza?
5. **What** time is the appointment?
6. **When** is he going to come?

Describing People, Places and Things

Questions usually start with words like **what**, **when**, **how**, **where**, **why**, **is**, **can**, **do**, **did**, **will**, **would**, c**ould**, etc. and that they are always placed *at the beginning* of the sentence. So we cannot say:

1. The time is like **what**?
2. You **can** please tell me the time?
3. The movie starts **what** time?
4. The appointment is **what** time?
5. He is going to come **when**?

If the question pertains to **asking for time**, they will typically begin with:
When… or What time… or Can you tell me…

Read this:

If the question pertains to **asking for time**, they will typically begin with: When or What time… or Can you tell me…Example:
1. What time is it? √
2. Where is the time? X

Read aloud the following sentences:

1. Dev Kumar is my **favourite film** star.
2. He is **tall**, **dark**, and **handsome**.
3. The clothes he wears are so **fashionable**.
4. His style of dressing **very soon** sets a trend that all follow.
5. I loved his **latest** movie *KabTak*.
6. In the movie, he plays the role of a thief **superbly**.
7. He wears **dark** clothes when he goes to burgle people's homes at night.
8. He is **almost never** caught. He manages to escape everytime.
9. **Once**, hearing some noise, the owner of the house switches on the lights.
10. Dev Kumar **quickly** puts on his ghost mask and the owner gets **so** scared that he jumps off the balcony!
11. Then Dev Kumar **silently** leaves the place but not without his booty.

An adjective describes a noun – a person, thing or place.

Example: Delhi is very **hot** in summer. (describing noun *summer*)
An adverb describes an adjective, a verb, or another adverb.

Example: Delhi is **very** hot in summer. (describing adjective *hot*)
The temperature **quickly** rises to over 40°C. (describing verb *rises*).

It **almost** never comes below 40°C in the month of June. (describing the adverb *never*)

Adjectives describe a noun/pronoun:

Framing Complete Sentences

1. This tea is **sweet**.
2. I am **angry** right now.

In the above sentences, the words "sweet" and "angry" describe the noun "tea" and the pronoun "I" respectively. Therefore, the words "sweet" and "angry" are adjectives. More examples are given below:

1. It looks like we have a **clear** sky today.
2. She looks **happy**, doesn't she?

Adverbs describe adjectives, verbs, or other adverbs.
1. This tea is **very** sweet.
2. She gets angry **quickly**.
3. He was smiling **rather** sadly.

In the first example, the adverb "very" describes the adjective "sweet".

In the second example, the adverb "quickly" describes the verb "gets".
In the third example, the adverb "rather" describes the adverb "sadly".

More examples are given below:
1. She is **so** excited about the party.
2. We arranged the place **nicely**.
3. Spring gets over **too** soon.\

A complete sentence should have a **subject** and a **verb**; otherwise, it is just a fragment of a sentence.

Read the following sentences:

- ☐ Is a cold day. ("Is a cold day" does not have the **subject** "*It*"). The complete sentence would be "It is a cold day".
- ☐ The sky clear. ("The sky clear" does not have the **verb** "*is*"). The complete sentence would be "The sky is clear".

You can also mention that typically, a sentence in English has the order SVO (Subject – Verb – Object). For example: The rain (subject) brought (verb) welcome relief from the heat (object).

A complete sentence is one that has a subject and a verb. For example, the sentence ―I a good dancer‖ is not a complete sentence as it does not have a verb. Now, if we added the verb ―am‖ to this sentence, it would be complete: I **am** a good dancer.

Similarly, the sentence "Am a good dancer" is not complete as a subject is missing. Therefore, we should add a subject to complete the fragment. For
Example: **I** am a good dancer.

Examples:
We have an English class today.
I go to office every weekday.
She likes oranges.

Every sentence must have a subject, a **verb** and although it is not necessary, an **object**. And the sentence must make **complete sense**.

For example,

1. I *eat*: Subject+*Verb*
2. I eat *vegetables*: Subject+Verb+*Object*

In order for a sentence to be meaningful, a sentence must have its parts in the above orders. For example:

1. I eat vegetables – is a sentence
2. I vegetables eat – is *not* a sentence
3. I like dancing.
4. I am here.
5. You go to school.
6. She has a nice smile.

Understand the meaning of words like "favourite", "pastime", "hobby", "passion", "passionate" and "fond" with the help of the following table.

Word	Meaning
Favourite	most liked
Pastime	a pleasurable means of passing the time
Hobby	an activity for enjoyment
Passion	a strong liking for something. An object of strong liking and enthusiasm
Passionate	having a strong liking for
Fond	having a strong liking for

Exercise

A. Frame a question for the following situations:

1. You want to ask a person his/her name.
2. You want to ask a person where he/she lives.
3. You want to ask what he/she is doing presently.
4. You want to ask why he/she is here.
5. You want to ask how he/she goes to office.
6. You want to ask when he/she is going back.

B. Identify the errors and correct the questions given below:

1. Can you do the work for me?
2. When do you want this book?
3. I can find the class where?
4. You will meet me at the station?
5. You can get the file?
6. Why are you so sad?
7. You are why so happy?
8. Do you work at the mall?
9. Where do you live?
10. What is the price of the book?
11. You do want some help?
12. Did you see the movie?
13. When did the movie start?
14. You will do me a favour?

Make simple questions using what you have learned and practiced. For example:

1. When do I have to come?
2. What time does the class start?
3. Can you tell me the reporting time for the flight?

Assessment

A. Tick the correct option:

1. It is the name of a person.
   a) Is it the name of a person?
   b) The name of a person is it?

2. The person is male.
   a) Is the person male?
   b) The person is male?

3. He is Indian.
   a) Is he Indian?
   b) He is Indian?

4. He is an actor.
   a) An actor he is?
   b) Is he an actor?

5. He is married.
   a) Is he married?
   b) Married he is?

6. He has two children.
   a) How many children does he have?
   b) How many he has children?

7. He has a son and a daughter.
   a) How many sons and daughters does he have?
   b) Sons and daughters how many he has?

8. He lives in Mumbai.
   a) Where does he live?
   b) In Mumbai he lives?

9. He was brought up in Delhi.
   a) He was brought up in Delhi?
   b) Where was he brought up?

B. Tick the correct option.

1.
   a. Is we on time?
   b. Are we on time?
2.
   a. When is the time by your watch?
   b. What is the time by your watch?
3.
   a. When does the train leave?
   b. What does the train leave?
4.
   a. At what time is the meeting?
   b. At when time is the meeting?
5.
   a. On time are we?
   b. Are we on time?
6.
   a. Could you tell me the time please?
   b. You could please tell me the time?
7.
   b. When wake up do you?
   c. When do you wake up?
8.
   a. Are you come on time?
   b. Will you come on time?
9.
   a. Is your flight on time?
   b. Your flight is on time?

10.
   a. When are you planning to leave for Bangalore?
   b. Are you when planning to leave for Bangalore?

C. Read the passage and identify whether the words in bold is adjective or adverb

There is this girl called Helen in our class. If you want to know how she looks, then here are the details: she is **quite tall**, she has **dark** skin, and her hair is **long** and **shiny**. Oh! She also has dimples (which we don't get to see often as she doesn't smile **much**!).

She doesn't talk much or take an **active** part in any group programs. No wonder why she stays **alone** most of the time. But she looks **very nice** when she smiles.

As I have already said, she has dimples which we don't see often (as she doesn't smile much). I think it was the smile that made me **strong enough** to talk to her **one** day.

"Hey Helen!" I said to her (I was **really afraid** she might not want to talk to me).
"Hi!" said Helen.
"Would you like to have lunch with me?"
"That's nice of you. But I do not eat meat. I hope you haven't brought meat?"
"Uh…yes...sorry!"

So, now I have one more thing to tell you about Helen. She is a vegetarian.

D. Write whether the words give below (as used in the passage) are adjectives or adverbs:

1. Quite_____
2. Tall_____
3. Dark _____
4. Long _____
5. Shiny _____
6. Much_____
7. Active_____
8. Alone _____
9. Very_____
10. Nice _____
11. Strong _____
12. Enough _____
13. Really _____
14. Afraid_____

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity:

Part – A

Differentiated between the following:

Adjective and adverb

Part – B

Discussed in class the following:

1. How to describe a person, place or a thing?
2. How to make interrogative sentences?

Part - C

Performance Standards

The performance standards may include, but not limited to:

Performance standards	**Yes**	**No**
Framed sentences to express time		
Framed sentences to describe a place, thing and people		
Framed sentences to give good wishes		
Framed sentences to invite people on different occasions		

Session 3: Describing Weather and Expressing Likes and Dislikes

In this session, you will learn how to describe the weather and express likes and dislikes using simple sentences.

Relevant Knowledge

Read and understand the following sentences:

1. It is very hot today.
2. It is very cold today.
3. It is raining today.
4. Today the weather is pleasant – it is neither too hot nor too cold.

Describing Weather

Read aloud the weather and climate descriptions given below:

Day's Weather	City's Climate
It is quite cold today.	It is very hot in summers.
It is very chilly today	It is very cold in winters.
It is so hot today	It gets very less rainfall.
It is quite warm today.	It gets a lot of rain in the monsoon season.
It seems it is going to rain.	It is neither too hot nor too cold.
What a downpour!	It is very cold in winters but pleasant in summers.
Haven't seen such rains for quite some time.	It is very hot in summers but cool in winters.
We are going to have a shower.	It rains almost throughout the year.
It is very pleasant today.	It is very hot during the day but cooler at nights.
It is neither too cold nor too hot.	It is hot and dry in summer.
Lovely day, isn't it?	
Looks like it isn't going to stop raining today!	
I think the skies are going to clear up later.	

Expressing Likes and Dislikes

Read the conversation given below:

A: Hi! How are you doing?
B: I am fine…what's up?
A: Nothing new. I was just going across to the shop to get a magazine. I am going to stay indoors and read all day today.
B: Yeah…I know. It is too hot to go out to play.
A: But you know, I think it is going to rain later in the day…do you see the dark clouds?
B: That would indeed be a welcome relief.
A: Yes, a cool shower would be great!
B: As it is so hot, why don't we go for a swim today?
A: Mom…it may rain in the evening…how about a dance in the rain instead?

Read aloud the following sentences:

1. Premchand is my **favourite** writer.
2. His novel, *Gaban*, is my **favourite** book.
3. I like the ghazals of Ustaad Amir Ali. The ghazal he sang in the movie *Leela* is my **favourite**.
4. The bookstore near my house is my **favourite** haunt. I always go there when I have the time to spare. Browsing through books is my **favourite** pastime.
5. Pizza is an **all-time favourite** snack. I can have it anytime, anywhere.
6. Tea is my **favourite** beverage. There is nothing like a hot cup of tea in winters and iced tea with lime in summers.
7. White is my **favourite** colour. Whenever I shop for clothes, I invariably select ones that are white.

Exercise

A. Correct these simple sentences using what you have learnt.

1. It was freezing cold yesterday.
2. Going to rain very soon.
3. It is so hot and humid.
4. The rain has only increased the humidity.
5. A nice breeze blowing.
6. Lovely weather this.

B. Tick the sentences that are meaningful and correct:

1. I very happy.
2. She is very happy.
3. He goes to school.
4. He does not go to school.
5. I oranges like.
6. Oranges I like
7. She and Meeta to theatre.
8. Meeta is going to the theatre.
9. You do your homework well.
10. Do your homework well.
11. I dancing like.
12. I here am.
13. You go school to.
14. She has a smile nice.

C. Find out the meanings of the words and write in the space given below:

1. Unique _____
2. Pet _____
3. Preferred_____

4. Choice _____
5. Favoured_____

Assessment

A. Tick the option which is a complete sentence.

1.
   (a) Today a fine day.
   (b) Today is a fine day.
   (c) A fine day.
2.
   (a) It is bright and sunny.
   (b) It bright and sunny.
   (c) It bright sunny
3.
   (a) It rained yesterday.
   (b) It raining yesterday.
   (c) Yesterday it raining.
4.
   (a) It was very cold.
   (b) It very cold.
   (c) It cold
5.
   (a) It is not cold today.
   (b) It not cold today.
   (c) It cold not today
6.
   (a) We on a picnic today.
   (b) We could go on a picnic today.
   (c) Could go on a picnic today.
7.
   (a) The sky seems clear and bright.
   (b) The sky clear and bright.
   (c) The seems clear and bright
8.
   (a) Thank God it is not raining.
   (b) Thank God it not raining.
   (c) Thank it raining not
9.
   (a) Should we umbrellas just in case it rains?
   (b) Should take umbrellas just in case it rains?
   (c) Should we take umbrellas just in case it rains?
10.
   (a) It will not rain today.
   (b) It not will rain today.
   (c) It not rain today
11.
   (a) I am person hardworking.
   (b) I am a hardworking person.
   (c) I hardworking.
12.
   (a) I am not lazy.
   (b) I lazy am not.
   (c) I not am lazy.
13.
   (a) I work team in well.
   (b) I work well in a team.
   (c) I team work well.

14.
   (a) I have good skills communication.
   (b) I good communication skills.
   (c) I have good communication skills.
15.
   (a) I don‘t give up easily.
   (b) I don‘t give easily up.
   (c) I give up easily don‘t.
16.
   (a) I get angry quickly.
   (b) I quickly angry get.
   (c) I angry get quickly

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity.

Part – A

Differentiated between the following:

1. Weather and climate
2. Like and dislike

Part – B

Discussed in class the following:

Making sentences to express about weather, people, places and things.

Part – C

Performance Standards

The performance standards may include, but not limited to:

Performance Standards	**Yes**	**No**
Framed sentences to express weather, people, places and things		
Framed sentences for expressing likes and dislikes		

SESSION 4: PRONOUNCING WORDS

In this session, you will study about the areas, relations, subfield, transcription and application of phonetics or phonology.

Relevant Knowledge

Every speaker has individual features in the acoustic signal of his/her voice (consonantal sounds, vocalic sounds, pitch, intonation, accent/dialect, social background, age, mood, etc.). Phonetics is a branch of linguistics that comprises the study of the sounds of human speech, or in the case of sign languages, the equivalent aspects of sign. It is concerned with the physical properties of speech sounds or signs (phones), their physiological production, acoustic properties, auditory perception, and neuro-physiological status.

Phonology, on the other hand, is concerned with the abstract, grammatical characterization of systems of sounds or signs. While it is widely agreed that phonology is grounded in phonetics, phonology is a distinct branch of linguistics, concerned with sounds and gestures as abstract units (e.g., distinctive features, phonemes, Mora, syllables, etc.) and their conditioned variation (via, e.g., allophonic rules, constraints, or derivational rules). Phonology relates to phonetics via the set of distinctive features, which map the abstract representations of speech units to articulator gestures, acoustic signals, and/or perceptual representations.

Sub-fields of Phonetics

The field of phonetics is a multi-layered subject of linguistics that focuses on speech. In the case of oral languages there are three basic areas of study:

(i) Articulator phonetics: The study of the production of speech sounds by the articulator and vocal tract by the speaker. It is concerned with the articulation of speech: the position, shape, and movement of articulators or speech organs, such as the lips, tongue, and vocal folds.

(ii) Acoustic phonetics: The study of the physical transmission of speech sounds from the speaker to the listener. The spectro-temporal properties of the sound waves produced by speech, such as their frequency, amplitude, and harmonic structure.

(iii) Auditory phonetics: The study of the reception and perception of speech sounds by the listener. These areas are inter-connected through the common mechanism of sound, such as wavelength (pitch), amplitude, and harmonics. It deals with the perception, categorization, and recognition of speech sounds and the role of the auditory system and the brain in the same.

Transcription

Phonetic transcription is a system for transcribing sounds that occur in a language, whether oral or sign. The most widely known system of phonetic transcription, the International Phonetic Alphabet (IPA), provides a standardized set of symbols for oral phones. The standardized nature of the IPA enables its users to transcribe accurately and consistently the phones of different languages, dialects, and idiolects. The IPA is a useful tool not only for the study of phonetics, but also for language teaching, professional acting, and speech pathology.

Applications of Phonetics

Applications of phonetics include the following:

Forensic phonetics: the use of phonetics (the science of speech) for forensic (legal) purposes, such as in hoax calls, sexual harassment calls, telephone calls from kidnappers, etc.

Speech Recognition: It is the translation of spoken words into text by a computer system. It analyses the person's specific voice and use it to fine tune the recognition of person's speech, resulting into more accurate transcription. Applications of speech recognition include (i) voice user interfaces, such as voice dialing, (ii) call routing, (iii) internet search, (iv) simple data entry and (v) speech to text processing.

Homonyms and Homophones

Homonyms are words that are both spelled and pronounced the same, but have different meanings. However, some authors use the term more broadly, to refer to homographs (spelled the same) or homophones (pronounced the same).

Examples of Homonyms

1. Air-Heir
2. Aisle-Isle
3. bare-Bear
4. Be-Bee
5. Beat-Beet
6. Buy-By
7. Cent-Scent
8. Die-Dye
9. Meat-Meet
10. Right-Write

Examples of Homophones

1. Their-There
2. Dam-Damn
3. Dear-Deer
4. Desert-Dessert

Like any other language, English has its own unique set of sounds. If you want to speak English well, you should pronounce English words correctly. Practice English pronunciation using dictionary and recordings.

Exercise

Practice the pronunciation of the following words:

Short A	Long A	Open A	An/m
At	Name	All	And
Have	Say	Want	Can
Had	Same	Also	Am
Has	Play	Small	Land
Add	Way	Water	Animal
Act	Make	Call	Stand
Ask	Day	Saw	Answer
Than	Change	Walk	Man
After	Page	Always	Plant
Back	May	Fall	Plan
Last	Take	Watch	Family
Example	Place	Talk	Am

Assessment

I. Short Answer Questions

1. State two applications of phonetics?

_____

_____

_____

2. What do you mean by acoustic phonetics?

_____

_____

_____

_____

_____

II. Fill in the blanks

1. Every speaker has individual features in the _____ signal of his/her voice
2. _____ is a branch of linguistics that comprises the study of the sounds of human speech
3. _____ is concerned with the abstract, grammatical characterization of systems of sounds or signs
4. _____ phonetics is the study of the production of speech sounds by the articulator and vocal tract by the speaker
5. _____ phonetics is the study of the physical transmission of speech sounds from the speaker to the listener
6. _____phonetics is the study of the reception and perception of speech sounds by the listener.

7. _____ transcription is a system for transcribing sounds that occur in a language, whether oral or sign.
8. Bare-Bear is an example of _____.

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity:

Part – A

Differentiated between the following:

1. Phonetics and phonology
2. Homonyms and homophones

Part – B

Discussed in class the following:

1. What is the relation between phonetics and phonology?
2. How to learn pronunciation of words?

Part - C

Performance Standards

The performance standards may include but not limited to:

Performance standards	Yes	No
Demonstrated the skill of using pronunciation symbols found in the dictionary		
Differentiated between the weak and strong form of pronunciation of common words		

SECTOR: HEALTHCARE

HSVT 203-NQ2017 - Customer Centricity

Student Workbook
(Class XI)

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Introduction

Customer service is the activity of identifying and satisfying customer needs. When a customer visits a retailer to buy something s/he expects that s/he should be welcomed properly and get all the information related to product, services and after sale services, such as; technical details or properties of the product, repayment terms, delivery, etc.

Customers expect that they should get some extra benefit in some cases from the additional service. At the same time hope that they will get a better treatment in availing after sales 'service' from the retailer.

Customer service is the "sum of acts and elements that allow consumers to receive what they need or desire from the retail establishment."

People look for positive attitude from the salesperson, which include respect, knowledgeable advice on products and a fair price.

When a customer enters the store, it is important that the retailer or the person handling the customer does everything to make the customer feel important and make sure that he/she leaves the store with utmost satisfaction. It requires that the customer should be properly greeted, made comfortable and handled properly through proper communication, gestures and body language.

Active listening, questioning and clarification are some of the important skills to learn in order to identify the needs of the customer and to ensure that she/he has understood the product or the services that she/he is looking for.

Making people feel special is one of the essential elements in establishing good relationships with customer. According to David Jenkin, author of the book on “What Great Retailers Do”, retailing is both a science and art.

Great retailers realize that it is essential to operate with strict discipline and have in place strong financial procedures while at the same time always being ready to quickly adapt business practices to customers’ needs to a great new idea or to competitive influences. In this Unit, you will learn about the essentials of dealing with customers and handling their queries and complaints.

Session 1: Handling Customers Effectively

In this session, you will learn how to deal with customers pleasantly and effectively.

Relevant Knowledge

A customer is the recipient of a goods or service, or a product, or an idea, obtained from a seller, vendor, or supplier via a financial transaction or exchange for money or some other valuable consideration.

Talking to a customer requires good communication skills. When you meet a customer, you always need to start by saying "hello" and "nice to meet you". Say "thank you" for expressing your gratitude and "goodbye" when the customer leaves the store, even if has not bought anything.

It is really important because the customer who is leaving your store today without buying your product or service may come back someday or reach out to tell others about it because of your good behaviour. Always speak in a language that your customer can easily understand and appreciate.

Answering customer's telephone calls

The way you answer your telephone creates an immediate impression, especially if it is your first contact with the caller. When answering the phone in the workplace, identify yourself to let callers know who they reached, establish a friendly tone for the conversation, and be responsive in general. Table 1 summarizes the do's and don'ts that the salesperson should follow while speaking to a customer.

Do's and don'ts while Speaking to a Customer

Element	Do's	Don'ts
Answering	Answer promptly, such as within three rings, if you are answering a telephone call	Don't risk missing an important call
Greeting	Start with a standard greeting such as "Hello," "Good morning," or "Good afternoon"	Don't use expressions such as "Yes?", "Uh-huh," or your last name
Talking and Listening	Focus on the caller. If you receive a call at inconvenient time, offer to call back later	Don't check your mail or do something else that will distract you from call Don't answer the phone with anything in your mouth

1. Introduce yourself

Introduce yourself with your first and last name and the name of your organisation or department. If most of your calls come from people outside of your company, start with the name of the organization. For example, "Thank you for calling ABC. This is Manisha. How can I help you?" If most of your calls come from within the organization, use the name of your department: "This is Rita from Enquiry Department."

2. Focus on your caller

It is discouraging and unproductive to have a conversation with someone who is checking e-mail, reading the newspaper, or is otherwise distracted. When you speak on the phone, focus your attention on the caller. Turn away from your work and computer when listening and talking. Doing this helps you sound respectful and responsive to your caller.

3. Be prepared to talk

Do not chew gum, eat, or drink when talking on the telephone. Because the microphones in handsets and cell phones are sensitive, your caller will clearly hear the sounds that you are making. Remove any chewing gum or swallow food that you are eating before answering a telephone call.

4. Don't let the telephone interrupt you

If someone calls at an inconvenient time, let them know and offer to call back later. If you are especially busy or having an important meeting with someone, mute your ringer and let the call transfer to voice mail. Be sure to check these messages when your schedule permits.

Telephone Etiquette

The following etiquette should be followed while talking on telephone:

- ☐ Pick up or answer the telephone before the third ring.
- ☐ Some words that you should use in your conversations on telephone are "**Hello! Good Morning/Good Afternoon/Good Evening**". Speak clearly and identify yourself.
- ☐ If the caller does not introduce himself/herself, say, "**May I know who is speaking?"**
- ☐ In case the caller does not tell to whom he/she wants to talk to, then you may ask questions like **"May I know to whom you want to talk to?"**
- ☐ In case you have to take a message then you may say **"I'm sorry, he's busy at the moment. May I take a message?"** or May I take your name and number and have him/her call you

back? (Be sure to write down the name, phone number, time the caller had called and the message).

- ☐ Ask the caller to wait while you acquire the information required.
- ☐ Don't make the caller wait for more than 02 minutes. It is better to return a call than to keep someone on hold too long. Do not forget to return the call.
- ☐ At the end of the waiting period, please express your gratitude for caller's patience.
- ☐ Keep your conversation to the point.
- ☐ End the conversation with gratitude.
- ☐ Always use a pleasant and friendly tone.
- ☐ Before placing a caller on hold, ask his/her permission first. For example, **"could you please hold the line, while I call the person"**.
- ☐ Avoid leaving long messages.
- ☐ Do not interrupt the person while he/she is talking to you.
- ☐ Do not answer the phone if you are eating. You should mention that you are having your meal and you will call back after you have finished.

Exercise

Visit a mobile store and study the ways and means adopted by the sales person in convincing the customers about the utility, price and quality of the mobiles. Prepare a 2-page note based on your observations and include the same in your portfolio.

Assessment

Short Answer Questions

List at least 06 points that you will consider while talking to a customer about the product features of a healthcare equipment to a customer.

1.

2.

3.

4.

5.

6.

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity:

Part – A

Differentiated between the following:

1. Goods and products
2. Goods and services
3. Tangible and intangible
4. Customer and consumer

Part – B

Discussed in class the following:

1. How to talk to a customer on phone?
2. Do's and don'ts while speaking to customers on phone.

Part - B

Performance Standards

The performance standards may include, but not limited to:

Performance standards	**Yes**	**No**
Followed do's and don'ts while demonstrating the skill of talking to a customer on phone		

Session 2: Taking Orders on Call

In this session, you will be able to learn the ideal way of interacting with callers when taking orders over the telephone.

Relevant Knowledge

Telemarketing is an act of selling goods and services to potential customers over telephone. A telemarketer is a person who is responsible for selling a product or service over the phone. Telemarketers may work in a private office, from a call centre or from home. It is often the case that telemarketers never met their customers' face to face, so good telemarketing skills are of utmost importance to achieving success as a telemarketer. Follow these suggestions for how to be a good telemarketer.

- ☐ Learn as much as you can about what you are selling. You should have a thorough understanding of what it is, how it works and how it may be useful to potential customers. Additionally, you should have genuine confidence in what you are selling, and in its value to the people you will be calling.
- ☐ Learn about the company you work for. A good telemarketer not only sells a product or service, but also sells the company's brand. You should be able to tell potential customers why they should choose you over your competitors. Study the company's history, philosophy, customer reviews/testimonials and industry ratings in order to be able to provide customers with a complete and favourable picture of who they are dealing with.
- ☐ Make sure you understand the sales process. Once you convince a customer to invest in what you are selling, good telemarketing skills require that you are able to explain the sales process from start to finish. This includes closing paperwork, billing, shipping, refund/return policies, customer support and any necessary follow-up.
- ☐ Compile contact information for your customers. You should have the business name, mailing address, phone number(s), email address, website, your manager's relevant information (especially if you work in a call centre) and any other pertinent contact information that your customers may ask for over the telephone.
- ☐ Practice your script. Read it aloud until you are comfortable that you can deliver it without any prompts.

Express confidence

A good telemarketer speaks with a tone of authority that puts customers' minds at ease. If you are amply prepared, then you should be able to talk about the reason for your call and your company with confidence.

Practice effective communications skills

- ☐ Speak slowly, loudly and clearly enough so that customers can easily understand your conversation. Do not mumble.
- ☐ Be considerate of the people you are calling. Introduce yourself and explain the purpose of your call as soon as possible in the conversation. Pause and take time to listen to responses as you go.
- ☐ Find the right balance between saying too much and not saying enough. Dead air during a telephone conversation can be uncomfortable. On the other hand, you can overwhelm and confuse a potential customer by saying too much, too fast.
- ☐ Avoid distracting conversation spacers such as, "um" and "ah."

Try not to sound rehearsed

Scripts are common in telemarketing, especially in a call centre atmosphere, but it is possible to deliver a script without sounding like you are reading from a piece of paper. Take some slow breaths and relax before making your calls, then focus on the message behind what you are saying rather than the words themselves.

Maintain a positive mental attitude

Remember that some (or many) of the people you call may not be expecting your call and, additionally, may not be receptive to your call.

It is not unusual for even a good telemarketer to be rejected by several potential customers in a row before reaching an interested customer. Do not take rejections personally but, rather, take them as opportunities to develop your telemarketing skills.

Stay resilient

Telemarketing is a numbers game, and it takes time and persistence to develop good telemarketing skills. Commit to making a certain number of calls each day and see those calls through.

Recognize when it is time to move on to the next call

If a contact is expressly not interested in what you have to say, then politely end the call and move on to the next call.

Exercise

Suppose you have to sell a product (e.g. medical equipment) to the customer. Write the conversation that will take place between you and the customer.

_____
_____
_____
_____
_____
_____
_____

Assessment

Fill in the blanks

1. Telemarketing is an act of selling goods and services to potential customers over _____.
2. A telemarketer is responsible for _____ and services to potential customers over telephone.
3. A good telemarketer speaks with a tone of _____ that puts customer's minds at ease.
4. A good telemarketer not only sells a product or service, but also sells the company's _____.
5. While talking to a customer on telephone, you should speak _____, loudly and _____ so that customers can easily understand your conversation.

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity:

Part A

Differentiated between the following:

Direct marketing and telemarketing

Part B

Discussed in class the following:

1. Preparation before receiving the call
2. How to build positive mental attitude while talking on telephone to a customer?

Part - C

Performance Standards

The performance standards may include, but not limited to:

Performance Standards	Yes	No
Demonstrated the skill of talking to a potential customer on telephone for convincing him/her about a good or service provided by a healthcare equipment company		

Session 3: Handling Customer Complaints

In the session, you will learn how to handle complaints from various types of customers.

Relevant Knowledge

Managing and maintaining good relations with customers is the duty of every individual in an organization, particularly the salesperson. Customer relationship, management includes identification of customer needs, effective communication competencies, resolution of a conflict situations and addressing the concerns of the customer by overcoming challenges that may emerge during provision of services.

Handling Customers

- ☐ **Identifying the needs of the customer**: This is needed to specifically address the need of the client.

- ☐ **Effective Customer Communication:** The staff should overcome barriers in communication, if any, and ensure that reasonable customer suggestions or corrections are taken immediately. Note of suitable follow up action should be taken quickly and a feedback should be provided in all cases.It would be useful to develop a mechanism where customers could raise their issues on which action is taken.

- ☐ **Addressing Grievances:** If despite best efforts, the customers have any grievance, it should be promptly addressed. Proper review of all grievances and action taken should be maintained. If a particular issue cannot be resolved, it should be escalated to higher levels.

At some point, everyone in business has to deal with an upset customer. The challenge is to handle the situation in a way that leaves the customer thinking you operate a great company. If you are lucky, you can even encourage him or her to serve as a passionate advocate for your brand.

WHAT GOOD CUSTOMER SERVICE MEANS?

When it comes down to it, many customers do not even bother to complain. They simply leave and buy from your competitors. Research suggests that up to 80 percent of customers who leave were, in fact, "satisfied" with the original company. Obviously, customer satisfaction is not enough. Businesses nowadays need to positively delight customers if they want to earn their loyalty.

It may seem counter-intuitive, but a business owner’s ability to effectively deal with customer complaints provides a great opportunity to turn dissatisfied customers into active promoters of the business.

Listen carefully to what the customer has to say, and let them finish

Don't get defensive. The customer is not attacking you personally; he or she has a problem and is upset. Repeat back what you are hearing to show that you have listened.

Ask questions in a caring and concerned manner

The more information you can get from the customer, the better you will understand his or her perspective.

Put yourself in customer's shoes
As a salesperson, your goal is to solve the problem, not argue. The customer needs to feel like you are on his/her side and that you empathize with the situation.

Apologize without blaming

When a customer senses that you are sincerely sorry, it usually diffuses the situation. Don't blame another person or department. Just say, "I'm sorry about that."

Become a partner with the customer in solving the problem

Ask the customer, "What would be an acceptable solution to you?"
Whether or not the customer knows what a good solution would be.

Solve the problem, or find someone who can solve it quickly!
When complaints are moved up the chain of command, they become more expensive to handle and only add to the customer's frustration.

Negative word of mouth is spread and believed at twice the rate of positive word of mouth. Things customers say they value highly include:

- ☐ having a problem fixed first time, and on time
- ☐ having confidence that you know what you are doing
- ☐ not being blamed for the problem
- ☐ showing concern for their situation
- ☐ being kept informed of progress
- ☐ being advised what they can do to help avoid the problem recurring.

Handling complaints

Examples of poor complaint handling which we have seen include:

- ☐ Not having any way for customers to make their complaints to you
- ☐ Not having a system to record complaints

- ☐ Failing to acknowledge there is a problem
- ☐ Not taking responsibility for the problem, and repeatedly giving the customer the run-around by making them deal with other staff
- ☐ Blaming the customer for the problem, or saying no-one else has complained
- ☐ Lack of knowledge of the problem
- ☐ Lack of knowledge of consumer law
- ☐ Taking too long to respond
- ☐ Having staff with no authority to make decisions to help the customer
- ☐ Offering no solution or offering a solution which is unlikely to resolve the problem
- ☐ Promising to contact the customer and not doing so.

The following checklists include ideas to help achieve the above principles and to help you develop good complaints handling systems.

Reporting the problem

Ensure that your contact details are readily available to customers.

When the problem is reported

- ☐ Thank the customer for bringing the problem to your attention.
- ☐ Treat the customer with empathy, courtesy, patience, honesty and fairness.
- ☐ Speak to the customer in person, and do not rely solely on written complaints, or records of conversations.
- ☐ Show the customer that you clearly understand the problem by listening and taking notes.
- ☐ Ask questions to clarify the situation.
- ☐ Do not jump to conclusions or become defensive.
- ☐ Summarise back to the customer your understanding of the problem.
- ☐ Respond to the problem quickly, tell the customer how it will be handled and tell him/her when they can expect a response.

Solving the problem

- ☐ Tell the customer you are taking responsibility for dealing with the problem.
- ☐ Familiarise yourself with any background information. This could include checking internal records, speaking to staff and checking how this compares with the customer's version of events.
- ☐ Be solution-focused by involving the customer in this process.
- ☐ Make sure the customer is happy with the proposed solution before going ahead.

- ☐ Ensure that the solution meets any legal obligations. If the customer is asking for more than their legal right and you feel they are making an unrealistic demand, explain what the law says.
- ☐ Where there are no legal obligations, offer a solution that in the circumstances best meets the needs of your business.
- ☐ Make sure you do what you promised to do, and do not delay – quick action will keep customers happy, but stalling and delays will lose customers. If there is going to be a delay, tell the customer.
- ☐ Tell the customer what your business will do to prevent the problem from happening again.

Following up after the problem

- ☐ Keep a record of the complaint, and what you have agreed with the customer.
- ☐ Invite the customer to inform you promptly if they are not satisfied.
- ☐ Keep a record of all problems and complaints raised.
- ☐ Use these records to help you evaluate your complaint handling systems. They can help you identify recurring problems with particular goods you sell or services you offer.
- ☐ Check how well and how quickly complaints could be handled.

Exercise

Visit a nearby customer care service centre and prepare a report on the procedure followed by the person at the customer care service desk in handling complaints of customers. Record the discussion and express your opinion and ideas on the ways the person could have handled the customer more effectively.

Role Play

Salesperson: "Good Afternoon Sir. Welcome to Wonderful Mobile Phone Store. My name is Mahesh. May I help you?
Customer: I bought this phone from your shop last week and it has not worked right at all! The battery does not work long and the phone drops calls everywhere I go. I need my money back.

Write in the space given below about "How would you respond?" to the customer's complaint.

_____
_____
_____
_____
_____
_____
_____
_____

_____
_____
_____
_____
_____
_____
_____

Assessment

Short Answer Questions

1. What is the meaning of good customer service?

_____
_____
_____
_____
_____

2. After solving any issue, how will you follow up with the customer?

_____
_____
_____
_____
_____

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity:

Part – A

Differentiated between the following:

Customer complaint and customer query

Part – B

Discussed in class the following:

1. Handling complaints
2. Procedure for reporting a problem to the supervisor

Part - C

Performance Standards

The performance standards may include, but not limited to:

Performance Standards	Yes	No
Demonstrated the skill of handling demanding customer's		
Demonstrated the skill of handling customers in difficult situations		

Session 4: Answering Enquiries

In this session, you will learn how to answer enquiries of customers.

Relevant Knowledge

Answering customer's questions or queries is a major part of many people who are into sales jobs. Some people can answer customer's question if they are knowledgeable of the company's products or services. While this may not be true in some cases. In reality, there is so much more to consider when answering questions than just having product knowledge. For instance, if a customer asks you for the balance due on his account, you can quickly give it to him or provide the balance along with additional information that the customer could benefit from—maybe a special offer coming up next month.

Types of Queries

Customer may have general enquiries related to the products or may have queries related to handsets, order completion or bills.

Answering with Style

As simple as it may sound, there is an art to answering customer's questions with style. Below are a few tips for you to keep in mind when you are faced with customer's questions:

- ☐ **Use a positive tone of voice** -You can say the exact same thing with two different tones of voice, and the messages will be perceived differently. Whether in person, on the phone, or in writing, the tone of voice you exude can affect how you are perceived in your customers' eyes. No matter what, when answering your customers' questions, always project a confident and pleasant tone of voice, even if the customers are not very pleasant with you.

- ☐ **Be professional** - Choose your words carefully, use correct grammar, and avoid using jargon that your customers may not be familiar with. In addition to avoiding jargon, you also want to stay away from using slang terms.

- ☐ **Be aware of your rate of speech** -Do not talk so fast that customers do not understand what you want to convey. Speak at a natural pace that is not too slow and not too fast.

- ☐ **Empathize with the customer**- If customers are upset, many a times they want you to know what they are experiencing. What they are looking for is some sort of empathy and a solution. In this day and age, empathy seems to be overlooked, and many agents just focus on a solution. Nothing can upset your customers more than not listening to them and not acknowledging their feelings before giving them an answer.

Exercise

Confirm your understanding

In order to help your customer, you have to fully understand what he or she wants, and make sure that you are both on the same page.

If applicable, offer your customer options – Give your customers all the options available to them, and point out the value that each option offers to the customer.

Keep a catalogue or specification sheet about products, warranties and contracts close at hand when you answer customer service calls. This will give you a quick reference for answering questions.

Allow the customer to explain the question or issue

A customer with questions will likely have an explanation of the situation that caused the question to arise. Let the customer explain the question fully without interrupting so you understand what the customer is asking.

Take notes

Note down key words or notes while the customer is asking a question. Include key details that are being asked and any pertinent information the customer offers that will be pertinent in answering the customer's question. This allows you to retain information without interrupting.

If required, seek information or help from a colleague if they cannot answer their customer’s query or request

Repeat the question to the customer

Summarize and restate the customer's question back to him or her to be sure you understand what is being asked or what needs to be resolved. This technique lets the customer know you are listening and helps you verify the information.

Keep language positive

Avoid telling the customer with a question that something cannot be done or would never happen. This negative language is dismissive and could make the customer feel that you donot care about answering the question and helping him or her.

Promise only what you can deliver

Give a customer an exact date of delivery only if you can guarantee it. Making false statements about the delivery will result in a dissatisfied customer.

Visit a retail store selling healthcare equipment and discuss with the salesperson or owner of the store about the most frequently asked questions by the customers on the goods and services provided by the store.

Assessment

Fill in the blanks

1. Do you have _____ ?
2. Can I _____this brand of mobile?
3. Why haven't you got _____?
4. Why has the _____ gone up?
5. How _____discount you will give on this product?
6. Where can I _____ the cover of this mobile?
7. Can you tell me _____ this mobile?
8. How do I make a _____ about this product?
9. Where is this shop _____?
10. Do you have an _____ for this item?
11. How long is the _____ on for?
12. What is it _____ from?
13. How does it _____?
14. What colours/_____/weights are available?

Checklist for Assessment

Use the following checklist to see if you have met all the requirements for assessment activity:

Part - A

Differentiated between query and enquiry.

Part - B

Discussed in class the following:

1. How to answer enquiries related to healthcare equipment?
2. How to answer enquiries related to brands of a product?

Part - C

Performance Standards

The performance standards may include, but not limited to:

Performance Standards	Yes	No
Demonstrated the knowledge of recognising and dealing with customer queries, requests and complaints		

SECTOR: HEALTHCARE

HSVT204-NQ2017: Structure of Human Eye

Student Workbook
(Class XI)

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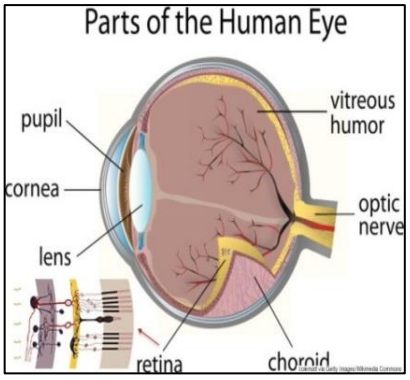
Session 1: Components of Human Eye

In this session, you will learn about the different parts of human eye and how it is functionally connected to the human body.

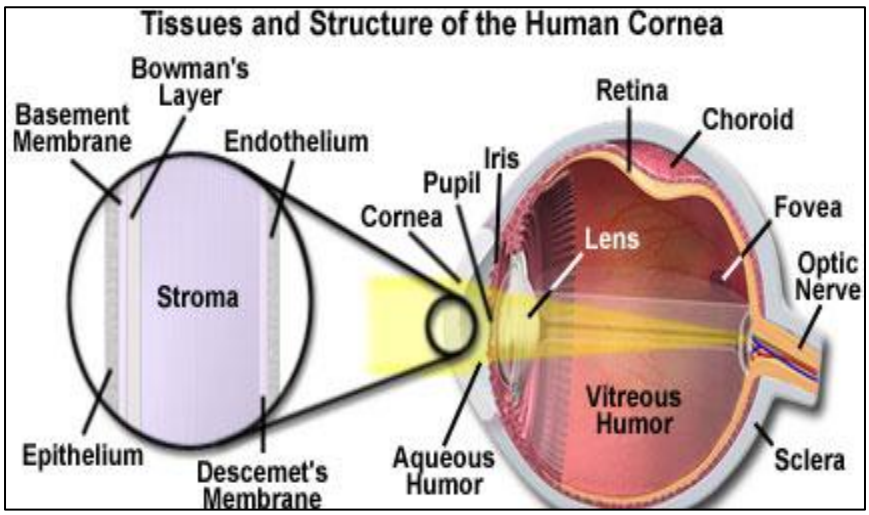
Relevant Knowledge

The human eye is one of the most important organs in the human body. It is very sensitive and exposed to a variety of diseases, therefore care is to be taken to protect it and keep safe.



i.huffpost.com

The **cornea** is the transparent front part of the eye that covers the iris, pupil, and anterior chamber. The cornea, with the anterior chamber and lens, refracts light, with the cornea accounting for approximately two-thirds of the eye's total optical power. The cornea has unmyelinated nerve endings sensitive to touch, temperature and chemicals; a touch of the cornea causes an involuntary reflex to close the eyelid. Because transparency is of prime importance, the cornea does not have blood vessels; it receives nutrients via diffusion from the tear fluid through the outside surface and the aqueous humour through the inside surface, and also from neurotrophins supplied by nerve fibres that innervate it.



micro.magnet.fsu.edu

The **sclera**, also known as the white of the eye is the opaque, fibrous, protective, outer layer of the eye containing collagen and elastic fibre. In humans, the whole sclera is white contrasting with the coloured iris, but in other mammals the visible part of the sclera matches the colour of the iris, so the white part does not normally show. In the development of the embryo, the sclera is derived from the neural crest. In children, it is thinner and shows some of the underlying pigment, appearing slightly blue. In the elderly, fatty deposits on the sclera can make it appear slightly yellow. The sclera forms the posterior five-sixths of the connective tissue coat of the globe. It is continuous with the dura mater and the cornea, and maintains the shape of the globe, offering resistance to internal and external forces, and provides an attachment for the extra ocular muscle insertions.

Three Layers of Human Eye

The eyeball (globe or bulb) has three concentric coverings.

- an external, fibrous tunic comprising the cornea and sclera;
- a middle, vascular tunic comprising the iris, ciliary body, and choroid; and
- an internal, nervous tunic, or retina.

External fibrous tunic

The cornea is the anterior, transparent part of the eye, and it forms about one-sixth of the circumference of the fibrous coat. Most of the refraction by the eye takes place not in the lens but at the surface of the cornea. The cornea is continuous with the conjunctiva and the junctional region is known as the limbus. The cornea is supplied by the ophthalmic nerve (from the fifth cranial nerve) by means of its ciliary branches. The eyelids close on stimulation of the cornea. The cornea is vascular and consists of five layers histologically: a largely collagenous substantiapropria enclosed by anterior and posterior epithelia and limiting laminae.

Middle vascular tunic

The middle tunic, frequently termed the uvea, comprises the choroid, the ciliary body, and the iris, from posterior to anterior.

- The choroid is a vascular, highly pigmented coat that lines most of the sclera.
- The ciliary body connects the choroid with the iris. The part near the choroid is a smooth ciliary ring (pars plana), whereas that near the iris is a ridged crown (pars plicata). The ciliary body contains the ciliary muscle and the ciliary processes, and is lined by the ciliary part of the retina.

Internal nervous tunic (retina)

The retina contains special receptors on which the inverted image of object is seen. Because of the partial crossing of nerve fibres at the optic chiasma, the retina of each eye is connected with both right and left visual areas of the forebrain. The retina is shaped like a sphere that has had its anterior segment removed, leaving an irregular margin, termed the oraserrata. The sensory elements of the retina end at the ora, but a pigmented continuation lines the ciliary body and the posterior part of the iris as the ciliary and iridial parts of the retina.

The **anterior segment** is the front one third of the eye that includes the structures in front of the vitreous humour i.e. the cornea, iris, ciliary body, and lens. Within the anterior segment are two fluid-filled spaces i.e. the anterior chamber between the posterior surface of the cornea (i.e. the corneal endothelium) and the iris.

The **posterior segment** is the back two-thirds of the eye that includes the anterior hyaloid membrane and all of the optical structures behind it i.e. the vitreous humor, retina, choroid, and optic nerve. The posterior segment is the back two-thirds of the eye that includes the anterior hyaloid membrane and all structures behind it: the vitreous humor, retina, choroid, and optic nerve.

Exercise

Draw a diagram of the eye and label the following parts:

a) Fibrous tunic
b) Iris
c) Retina
d) Lens

Assessment

I. Multiple Choice Questions

1. The transparent front part of the eye is

(a) Sclera
(b) Cornea
(c) Retina
(d) Iris

2. The junctional region of cornea is known as

(a) Uvea
(b) Choroid
(c) limbus
(d) Sclera

3. _____forms the posterior five-sixths of the connective tissue coat of the globe

(a) Cornea
(b) Sclera
(c) Iris
(d) Ciliary Body.

4. _____is the front one third of the eye that includes the structures in front of the vitreous humour

(a) Cornea
(b) Iris
(c) Anterior segment
(d) Posterior segment

5. _____is the chamber between the posterior surface of the cornea and the iris.

(a) Limbus
(b) Posterior Chamber
(c) Oraserrata
(d) Anterior chamber

II. Fill in the Blanks

1. The _____is the transparent front part of the eye that covers the iris, pupil, and anterior chamber.
2. The _____also known as the white of the eye, is the opaque, fibrous, protective, outer layer of the eye containing collagen and elastic fibre.
3. In the development of the _____the sclera is derived from the neural crest.
4. The cornea is continuous with the conjunctiva and the junctional region is known as the _____ .
5. The _____segment is the front one third of the eye that includes the structures in front of the vitreous humour i.e. the cornea, iris, ciliary body, and lens.
6. The _____ segment is the back two-thirds of the eye that includes the anterior hyaloid membrane and all of the optical structures behind it i.e. the vitreous humor, retina, choroid, and optic nerve.

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity:

Part A

Differentiated between the following:

1. Cornea and Sclera
2. Anterior segment and posterior segment

Part B

Discussed in class the following:

1. Different parts of human eye
2. Different layers of human eye
3. Functions of different parts of human eye.

Part C

Performance standards

The performance standards may include, but not limited to:

Performance Standards	Yes	No
Identified the internal and external anatomy of the eye, naming and locating the following parts: cornea, iris, pupil, lens, retina, sclera, vitreous and aqueous humours, choroid, optic nerve and blind spot		

Session 2: Field of View and Dynamic Range of Human Eye

In this session, you will learn about field of view and dynamic range of human eye.

Relevant Knowledge

Eyeball acts as a Camera. It perceives the image and relays the sensation to the occipital cortex of the brain via visual pathway which comprise optic nerve, optic chiasma, optic tract, lateral geniculate body and optic radiations.

Field of view

The **field of view** is the extent of the observable world that is seen at any given moment. In the context of human vision, the term "field of view" is typically used in the sense of a restriction to what is visible by external apparatus, like spectacles. The approximate field of view of an individual human eye is 95° away from the nose, 75° downward, 60° toward the nose, and 60° upward, allowing humans to have an almost 180-degree forward-facing horizontal field of view. With eyeball rotation of about 90° (head rotation excluded, peripheral vision included), horizontal field of view is as high as 270°. About 12–15° temporal and 1.5° below the horizontal is the optic nerve or blind spot which is roughly 7.5° high and 5.5° wide.

Dynamic range

The retina has a static contrast ratio of around 100:1 (about 6.5 f-stops). As soon as the eye moves (saccades) it re-adjusts its exposure both chemically and geometrically by adjusting the iris which regulates the size of the pupil. Initial dark adaptation takes place in approximately four seconds of profound, uninterrupted darkness; full adaptation through adjustments in retinal chemistry (the Purkinje effect) is mostly complete in thirty minutes. The process is nonlinear and multifaceted, so an interruption by light merely starts the adaptation process over again. Full adaptation is dependent on good blood flow; thus dark adaptation may be hampered by poor circulation, and vasoconstrictors like tobacco.

The human eye can detect a luminance range of 10^{14}, or one hundred trillion (100,000,000,000,000) (about 46.5 f-stops), from 10^{-6} cd/m^2, or one millionth (0.000001) of a candela per square meter to 10^{8} cd/m^2 or one hundred million (100,000,000) candelas per square meter. This range does not include looking at the midday sun (10^{9} cd/m^2) or lightning discharge.

At the low end of the range is the absolute threshold of vision for a steady light across a wide field of view, about 10^{-6} cd/m2 (0.000001 candela per square meter).The upper end of the range is given in terms of normal visual performance as 10^{8} cd/m^2 (100,000,000 or one hundred million candelas per square meter).

The eye includes a lens similar to lenses found in optical instruments such as cameras and the same principles can be applied. The pupil of the human eye is its aperture and the iris is the diaphragm that serves as the aperture stop. Refraction in the cornea causes the effective aperture (the entrance pupil) to differ slightly from the physical pupil diameter. The entrance pupil is typically about 4 mm in diameter, although it can range from 2 mm (*f*/8.3) in a brightly lit place to 8 mm (*f*/2.1) in the dark. The latter value decreases slowly with age; older people's eyes sometimes dilate to not more than 5-6mm.

Monocular vision is vision in which both eyes are used separately. By using the eyes in this way, as opposed by binocular vision, the field of view is increased, while depth perception is limited. Monocular vision affects how the brain perceives its surroundings by decreasing the available visual field, impairing peripheral vision on one side of the body, and compromising depth perception, all three of which are major contributors to the role of vision in balance. Most birds have monocular vision. With their eyes on each side of their head, it gives them a greater field of view, which is useful for spotting predators. However, they have poor depth perception.

Binocular vision is vision in which creatures having two eyes use them together. It is the ability to maintain visual focus on an object with both eyes, creating a single visual image. Inocular vision is generally considered to be able to look at the same object at the same time with both eyes, thus giving us perception of depth. Binocular vision can be divided into three levels of functionality: (i) Seeing with both eyes simultaneously- the ability to process images from both eyes at the same time; (ii) Fusion – two images is merged into one. The brain is able to interpret the two different images from right and left eye correctly and is able to give a single image as output. This happens if we are able to direct the two eyes in the same direction and focus on the same object. With the information from two eyes, most of us have a slightly higher visual acuity than with only one eye; (iii) Stereopsis – distance, depth and direction- It is our ability to see three dimensional. This depth of vision comes from the small differences in the images from the two eyes. The brain uses these clues to help us assess distance to objects. Binocular vision is required for driver's license. It is also important for catching a ball and many other coordinated operations.

Assessment

I. Fill in the Blanks

1. The retina has a static contrast ratio of around _____.
2. Optic disk is also known as the _____.
3. The human eye can detect a luminance range of _____.
4. The eye includes a lens similar to lenses found in _____.
5. The optic disk is _____ in shape.

II. Short Answer Questions:

1. Describe the field of view of human eye.

_____
_____
_____
_____

2. Explain the dynamic range of human eye.

_____
_____
_____
_____

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity:

Part A

Differentiated between the following:

Monocular and binocular vision

Part B

Discussed in class the following:

Human eye range

Part C

Performance standards

The performance standards may include, but not limited to:

Performance standards	**Yes**	**No**
Demonstrated an understanding that light is focused on the retina by the action of the lens and cornea		
Explained the difference between monocular vision and binocular vision		

Session 3: Movements of Human Eye

In this session, you will learn about the various types of eye movements.

Relevant Knowledge

Types of eye movements

Although the eyes can be moved voluntarily, most eye movements are through reflexes. The principal types of movement include voluntary motion (both vertical and horizontal), tracking (both voluntary and involuntary) and convergence. Additionally, there are pupillary reactions and control of the lens. The retina is a light-sensitive layer at the back of the eye that covers about 65 percent of its interior surface. Photosensitive cells called rods and cones in the retina convert incident light energy into signals that are carried to the brain by the optic nerve. In the middle of the retina is a small dimple called the fovea or fovea centralis. It is the center of the eye's sharpest vision and the location of most colour perception.

Muscles of the eye

Eye position and motion is controlled by six muscles in each eye. All muscles are tonically active to maintain stability of the eyes. Each eye can be adducted, abducted, elevated, depressed, intorted or extorted. Additionally, this motion must be conjugate in order to prevent diplopia. Horizontal eye movements are controlled by the medial and lateral rectus muscles (adduct and abduct the eyes, respectively). Every movement that elevates the eye above or depresses below the horizontal plane requires the participation of at least two muscles because the axis of the orbit and the muscles of the eye are not directly in line with the visual axis. Accordingly, isolated contraction of the superior or inferior rectus muscles or the superior or inferior oblique muscles results in torsion and deviation of the eye during the process of elevation and depression. For this reason, at least two muscles are primarily active whenever the eyes are elevated or depressed. When looking straight up, the superior rectus and inferior oblique act together. Looking straight down employs the inferior rectus and superior oblique. The six positions of gaze are used to simplify analysis of eye muscle weakness.

Extraocular cranial nerves and nuclei

There are three cranial nerves innervating eye muscles. The oculomotor nerve, CNIII, innervates all of the extraocular muscles with the exception of the lateral rectus and superior oblique. It also innervates the elevator of the upper lid. These motor nerve fibres arise from the oculomotor nucleus, located within the midbrain just ventral to the periaqueductal gray. In addition to motor nerve fibres, the oculomotor nerve contains parasympathetic preganglionic nerve fibres. These nerve fibres synapse in the ciliary ganglion with

postganglionic fibres going to the constrictor of the pupil and to the ciliary muscle. Contraction of the ciliary muscle results in the lens becoming rounder, to allow for close focus. The parasympathetic nerve fibres in the oculomotor nerve arise from the Edinger-Westphal nucleus, which is located in the midline between the left and right oculomotor nuclei.

The oculomotor nerve leaves the midbrain in the interpeduncular fossa, passes between the superior cerebellar artery and the posterior cerebral artery and enters the dura. It passes through the wall of the cavernous sinus to reach the superior orbital fissure of the skull, which is how it enters the orbit. The cavernous sinus is immediately adjacent to the sellaturcica at the skull base, which contains the pituitary gland.

Voluntary eye movements

Voluntary eye movements occur in small jumps called saccades. These rapid movements occur so fast that the eye cannot see during the movement. Frequent small jumps (microsaccades) occur even when the eye is still.

Voluntary horizontal gaze and vertical gaze utilize different neuronal circuitry. Voluntary conjugate horizontal gaze is initiated by neurons in the frontal eye fields of the cerebral cortex. Activation of the right frontal eye field will cause the eyes to look to the left and activation of the left frontal eye field will cause the eyes to look to the right. Projections from the frontal eye field go directly and indirectly (via the superior colliculus) to the contralateral paramedianpontine reticular formation (the PPRF). The PPRF, the region of reticular formation immediately ventral to the abducens nucleus, contains neurons that are critical for generating horizontal saccades. Damage to the left PPRF, for example, will completely prevent the movement of either eye to the left.

Vestibulo-ocular reflex

The vestibulo-ocular reflex (VOR) produces eye movement in response to changes in head position. This is an extraordinarily accurate reflex that allows the eyes to remain focused on a target when the head moves. This is reflected in a 1:1 "gain" of this reflex (i.e., 3 degrees of head motion should cause an opposing 3 degrees of eye movement). Projections from the vestibular nerve terminate in the vestibular nucleus and cerebellar flocculus. Many neurons in the vestibular nucleus project to the extraocular nuclei and paramedianpontine reticular formation. The medial longitudinal fasciculus carries many of these connections. With abnormal vestibular input, the eyes will drift away from the direction of perceived motion (vertigo). However, if the person is awake, there will be saccades to reacquire the visual image as it begins to drift. This is the substrate for jerk nystagmus.

The VOR is a reflex response that must be adjusted over time. For example, if there is damage to the vestibular apparatus of an ear, there will be diminished input on that side. Nonetheless, the reflex must still maintain a "gain" of 1:1 causing the eyes to move contrary to head movement if vision is to be stabilized.

Tracking/smooth pursuit eye movements

Most of our normal voluntary eye movements are not smooth, but rather occur in saccades. However, we are able to move our eyes smoothly when tracking a moving object. Smooth pursuit eye movements utilize some of the vestibuloocular reflex pathways and require a visual input to the occipital cortex in order to permit locking of the eyes onto the target. The occipital eye fields are not as well defined as the frontal eye field. They are located in the region near the junction of the occipital lobes with the posterior parietal and temporal lobes (including visual association areas that are involved in detecting motion).

There are two reflexes that use the same wiring as smooth pursuit movements. These are the **fixation reflexes** and the **optokinetic reflexes**. "Fixation reflex" refers to the ability to fixate on a target that is moving. When the head is moving this reflex complements the VOR to stabilize the eyes. The optokinetic reflex (nystagmus; OKN) is an involuntary fixation on objects that are moving in relationship to the head. This is classically observed when looking out of the side of a moving vehicle and has been termed "railway nystagmus". The eyes will have the tendency to track moving objects, especially if they have very starkly contrasting features. They will track for a distance and then subsequently saccade in the opposite direction to reacquire a target. If one visual cortex is damaged, optokineticnystagmus will be lost when objects move toward the side of the cortex lesion (that is, if they approach an individual from the side of vision impairment).

Assessment

I. Short Answer Questions

1. What is fovea centralis?

_____
_____
_____

2. Name four types of eye movements.

_____
_____
_____
_____
_____

3. What is fixation reflex?

_____
_____
_____
_____

4. Explain the different types of human eye movement.

_____
_____
_____
_____

5. What are the different muscles of human eye?

_____
_____
_____
_____

6. What is VOR? Explain.

_____
_____
_____
_____

II. Fill in the Blanks

1. In the middle of the retina there is a small dimple which is called the _____.
2. The motion of the eye must be conjugate in order to prevent _____.
3. Voluntary eye movements occur in small jumps called _____.
4. The _____reflex produces eye movement in response to changes in head position.
5. There are two reflexes that use the same wiring as smooth pursuit movements which are the _____ reflexes and the _____ reflexes.

Checklist for Assessment

Use the following checklist to see if you have met all the requirements for assessment activity:

Part A

Differentiated between the following:

1. Saccades and microsaccades
2. Fixation reflexes and optokinetic reflexes
3. Vestibulo-ocular reflex and smooth-pursuit eye movements.

Part B

Discussed in class the following:

1. Vestibulo-ocular reflex
2. Types of eye movements
3. Saccades

Part C

Performance standards

The performance standards may include, but not limited to:

Performance Standards	**Yes**	**No**
Differentiated between the different eye movements		

SECTOR: HEALTHCARE

HSVT 205-NQ2017 - Basic Visual Assessment

Student Workbook
(Class XI)

Table of Contents	

Session 1: Eye Care Professionals

In this session, you will study about roles and functions of Ophthalmologist, Optometrist and Orthoptist.

Relevant Knowledge

Ophthalmologists

An Ophthalmologist is a specialist in medical and surgical eye problems. Since ophthalmologists perform operations on eyes, they are both surgical and medical specialists. A medical doctor specially trained in the medical and surgical care and treatment of eyes can be called as an Ophthalmologist. An advanced education and training is required to become an ophthalmologist. In India, after completing MBBS (Bachelor of Medicine & Bachelor of Surgery) degree, postgraduate study in ophthalmology is required.

Optometrists

Optometrists need not have to study medicine like doctors. The optometrists provide only limited forms of eye care. Bachelor of optometry is a course of three years of education where students are trained to examine the eyes to determine the presence of a limited number and type of vision problems related to eye movement. Optometrists prescribe only the eyeglasses and contact lenses at the initial stages.

Orthoptists

Orthoptists are also not required to study medicine like the optometrists. It is a full time three-year degree course to specialize in Orthoptic treatment. Orthoptists deal with assessing, diagnosing and managing the patient with eye muscle disorders. When appropriate, traditional Orthoptic exercise programmes are still employed. Othoptists work closely with ophthalmologists to confirm that the patient with eye muscle disorders are exposed to full range of treatment options. Orthoptists serve patients of all ages (adults and children).

The programme of therapy is based on the results of standardised tests, the needs of patient and the patient's symptoms. The exercises that the programme involves are the use of lenses, prisms filters, occludes, specialised instruments and computer programmes. Some of the exercises related to orthoptic visual therapies are as follows:

- ☐ Near point of convergence exercises.
- ☐ Base out prism reading
- ☐ The wearing of convex lenses
- ☐ Cawthorne Cooksey exercise
- ☐ Antisuppression exercise.

Behavioural Vision Therapy

Developmental optometry is the therapy that is used in behavioural vision therapy which is further practiced by behavioural optometrists. Patients having difficulties in visual attention and concentration are the symptoms observed in behavioural vision therapy which is classified as visual information processing weakness by the behavioural optometrists.

Assessment

I. Short Answer Questions

1. What is Ophthalmology?

_____
_____
_____
_____

2. What is the role of Optometrists?

_____
_____
_____
_____

3. What are the roles and functions of Ophthalmologists?

_____
_____
_____
_____

_____

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity:

Part - A

Differentiated between the following:

1. Ophthalmologists and Orthoptists.
2. Optometrists and Orthoptists

Part – B

Discussed in class the following:

1. Who are Ophthalmologists?
2. What are the functions of Ophthalmologists?

Part - C

Performance Standards

The performance standards may include but not limited to:

Performance Standards	**Yes**	**No**
Differentiated between the role and functions of Ophthalmologists and Optometrists		

Session 2: Basic Examination for Eye Diseases

In this session, you will learn about the basic examinations related to eye disease and visual disorder. Your will also learn different terms and instruments related to eye tests.

Relevant Knowledge

A series of tests are performed by an ophthalmologist, optometrist or orthoptist for assessing vision and the ability to focus or discern objects through an eye examination. People must have a routine eye check-up as it is being recommended by the health professionals as many eye diseases are asymptomatic.

Through an eye examination, various eye diseases can be detected such as blinding eye disease, ocular manifestations of systematic disease, and signs of tumours and other anomalies of the brain.

The eye examination consists of the following eye tests:

Visual Acuity

This test detects fine details and shows the quantitative measure of the eye's ability to see an in-focus image at a certain distance. This visual ability of the eye can be defined as visual acuity. In simple words, Visual Acuity refers to the ability to discern the shapes and details of the things a person can see. The standard definition of normal vision acuity (20/20 or 6/6 vision) is the ability to view a special pattern.

Normal vision is 20/20. This means that the test subject sees the same line of letters at a distance of 20 feet as does a person with normal vision. The term 6/6 is more commonly used in Europe and Australia which is represented in meters.

Visual acuity is measured in Snellen Chart.

Refraction

A process which eye care professionals use to measure the vision problem is refraction. The procedure by which any refractive error is characterized and qualified can be termed as refraction. An optical abnormality is the refractive error in which a corrective lens is required for proper focusing. A refraction error does not allow light to be brought into sharp focus on the retina as it results in blurred and distorted vision.

The examples of refractive error are; myopia, hyperopia and astigmatism. Refraction consists of two parts- Objective Refraction and Subjective Refraction.

(i) Objective Refraction

A refraction which is obtained without any feedback from the patient is known as objective refraction. Objective refraction is obtained by using different instruments. To measure refraction without being asked for subjective responses the doctor uses retinoscopy or auto-refractor. Retinoscopy is an instrument used for objective refraction.

Retinoscope

Based on eye movement and orientation of retinal reflection the doctor gets the clear view of the refractive state of the patient's eye and measures it.

Auto refraction is an instrument used for objective refraction. This instrument is computerized instrument that shines light into the eye. The light travels through front part of the eye to the back part of the eye and then back again.

Auto-refractors are quick and easy to use and do not require any feedback.

(ii) Subjective Refraction

A refraction that requires responses from the patient is known as subjective refraction.

A phoroptor trial frame is used by the professionals to look at an eye chart through which a feedback from the patient is asked in order to select the best lenses where the vision is clear.

Pupil Function

For the assessment of optic nerve anomalies seining flashlight is used by the general physicians. This process is conducted in semi-darkened room.

During this process, in normal reaction to the swinging flashlight test, both pupils constrict when it shines on the right eye as because the left eye does not respond to external stimulus but can receive neural signs from the brain to constrict.

Ocular Motility

When the patient complains about double vision, ocular motility should always be tested for neurological disease.

The patient is asked to move both of their eyes in each of the nine cardinal directions of the gaze. The extra ocular muscles are tested by the nine cardinal directions such as interior, superior, lateral, medial rectus muscles, superior and inferior oblique muscles.

Visual Field Testing

Visual field testing is done to assess the extent of the peripheral field. The problems included in the visual field testing are scotma, hemianopia, homonymous hemianopsia and bitemporal hemianopia.

External Examination

Inspection of the eyelids, palpebral fissure, surrounding tissues, palpitation of the orbital involves external examination of the eyes.

Slit-Lamp

In this process, the patient is seated while examining and the head is stabilized by an adjustable chin rest.

The ocular structures are examined by the examiner through an optical system that magnifies the image of the eye.

Slit Illumination Techniques

The ability to detect and observe various anterior segment condition depends on the observer to correctly adjust and position the illumination system of the slit lamp. The illumination techniques can be categorised into 4 main categories:

(i) Diffuse illumination: A diffuse filter is placed in the focused light bean of the slit lamp. It gives an even broad illumination over the eye.

Setting up diffuse illumination requires:

(i) Angle between slit-lamp and microscope should be from 10-70 degrees
(ii) Wide beam
(iii) Diffusing filter
(iv) Low to medium magnification

The slit lamp biomicroscope consists of 3 parts:

(i) The observation system-includes microscope to obtain magnification
(ii) The illumination system-the parts to be seen
(iii) The mechanical support system-for accurate and convenient positioning of the eye and the instrument

Direct Illumination

Direct illumination means that the observing system is focusing directly at the area under illumination.

It is further classified into following:

1. Optic section
2. Parallelepiped
3. Broad beam
4. Conical beam
5. Specular reflection

Optic Section

This technique utilizes a narrow, focused slit of 0.02 to 0.1 mm to produce a cross-section view especially of the cornea.

To set up

- ☐ 30 to 60 degrees angle between observation and illumination system
- ☐ Medium to high illumination

Used to observe

- ☐ Variation in corneal curvature
- ☐ Corneal thickness
- ☐ Depth of corneal opacities
- ☐ Foreign body embedded in cornea

Parallelepiped

This illumination is same as optic section except that the beam is broader than optic section. The size of beam is 0.1 to 0.7 mm. This is most commonly used beam and is commonly used to observe.

- ☐ Corneal stroma
- ☐ Corneal endothelium
- ☐ Corneal scarring
- ☐ Corneal staining
- ☐ Corneal infiltrates
- ☐ Neovascularization
- ☐ Striae and folds

Broad Beam Illumination

This is further widening of parallelepiped illumination beam to 1 to 5 mm.

This is used to observe:

- ☐ Corneal nerve fibres
- ☐ Debris beneath the contact lens
- ☐ Conjunctival scars

Conical Beam Illumination

This beam is utilized to observe the inflammatory or flair in the anterior chamber.

To set up

- ☐ Same as optic section
- ☐ Reduce the height of the beam to 1 to 2 mm.
- ☐ Focus on the iris first; slide forward the joystick to focus the cornea. Then move in between to observe the cells and flare
- ☐ The room /background should be dark.

Specular Reflection

This illumination is an extension of parallelepiped illumination, where the angle of the incident slit beam to the corneal surface equals angle of observation axis when seen through one of the oculars.

To set up

- ☐ 60 degrees angle between illumination and observation system
- ☐ Parallelepiped
- ☐ Move illumination arm until bright reflex is observed. At this point the angle of incidence is equal to angle of reflection.
- ☐ See through one oculars.
- ☐ Shift magnification to high now.
- ☐ Observe the endothelium mosaic in the dull image next to the bright reflex.

Used to Observe

- ☐ Endothelial mosaic along with guttae, folds, blebs.
- ☐ Tear layer stability and lipid layer.
- ☐ Lens front surface wetting.

Indirect Illumination

This refers to any technique where the focus of the illumination beam does not collide with the observation system. The two major indirect illuminations are:

- ☐ Retro-illumination
- ☐ Sclerotic scatter

Retro-illumination

This is further of two types:

- ☐ Direct
- ☐ Indirect

The light is reflected off the iris or fundus while the microscope is focused on the cornea.

To Set Up

- ☐ Offset the slit-beam.
- ☐ Create a parallelepiped beam.
- ☐ Illuminate the area behind the corneal area to be seen.
- ☐ Observe the cornea in the reflected light.
- ☐ Direct – See the corneal just in front of the illuminated area
- ☐ Indirect – See the corneal area adjacent to the illuminated area

Used to Observe

- ☐ Contact lens front and back surface deposits.
- ☐ Neovascularization, edema
- ☐ Microcsysts.
- ☐ Infiltrates

Sclerotic Scatter

This is a type of indirect illumination.

To Set Up

- ☐ Utilize a parallelepiped technique.
- ☐ Focus the beam on the nasal or temporal limbus.
- ☐ Light from the slit is totally internally reflected and the cornea glows.
- ☐ Observe the cornea against the bright glow.

Used to Observe

- ☐ Central corneal clouding
- ☐ Corneal scars
- ☐ Foreign body/deposits

Filtered Illumination

- ☐ Cobalt blue light and Wratten filter #12 – (yellow filter) is used to observe the corneal staining patterns and rigid gas permeable lens fitting relationship on the eye. This is frequently used illumination where the fluorescein dye and the filter is used to highlight the eye condition and the fitting. The yellow filter is an added attachment which when used with cobalt blue light enhances the contrast further and makes the observation easier.

Abnormalities

Checklist to be seen by slit lamp during contact lens examination:

- ☐ Blepharities
- ☐ Cornel infiltrates
- ☐ Iritis

- ☐ Ulcer
- ☐ Papillae or any other tarsal conjunctival abnormalities
- ☐ Corneal edema/striae/folds
- ☐ Neovascularization
- ☐ Corneal staining
- ☐ Microcysts
- ☐ Endothelial status

Intraocular Pressure

Intraocular pressure (IOP) is the fluid pressure inside the eye. By tonometry devices the intraocular pressure is measured.Tonometry is a device used to measure the pressure using various instruments. The normal range is 10-21 mmHg.

Retinal Examination

An important part of general eye examination is retinal examination. During fundus examination, the optic disc and retinal vasculature is viewed and the observations are recorded. This examination is done from a distance of about 50 cm and between the two eyes it is usually symmetrical. A cataract is indicated by opacity.

Assessment

A. Fill in the blanks

1. During _____ examination the optic disc and _____ _____ is viewed and the observations are recorded.
2. In _____ process the patient's head is _____ by an adjustable chin rest.
3. _____ _____ _____ is done to assess the extent of the peripheral field.
4. A _____ trial frame is used by the professionals.
5. Auto refraction is an instrument used for _____ _____.

B. Short Questions

1. Name the different eye diseases?

_____
_____
_____
_____

2. What is refractive error?

_____
_____
_____
_____

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for Assessment Activity.

Part – A

Differentiated between the following:

Different types of eye diseases.

Part – B

Discussed in class the following:

1. Retinal examination
2. Double vision

Part - C

Performance Standards

The performance standards may include, but not limited to:

Performance Standards	**Yes**	**No**
Identified various types of eye disease through vision examination		
Demonstrated the skill of conducting eye examination		

Session 3: Eye Examination

In this session, you will learn about the basic eye examination processes and the procedure to conduct these eye tests and the various equipment used.

Relevant Knowledge

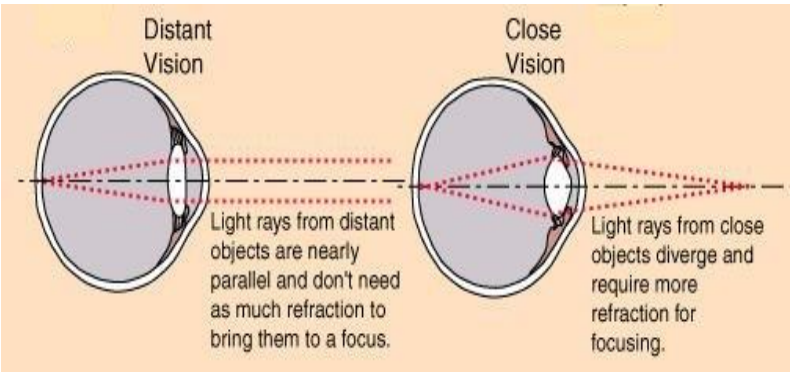
In an emmetropic eye, parallel rays of light coming from infinity are brought to focus on the retina, with accommodation at rest.

To check for eye diseases and the vision, a series of tests are designed. A variety of instruments are used by the doctor like shine bright lights.

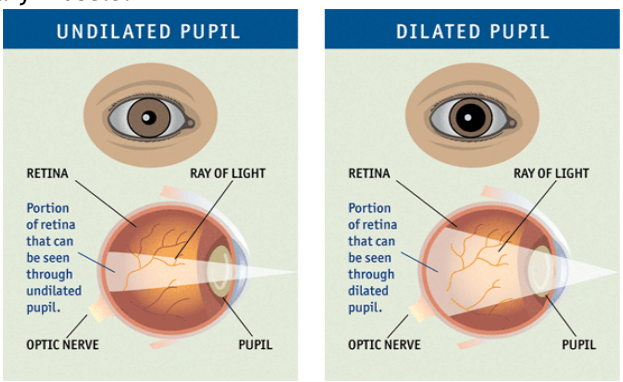
The procedures of eye examination are as follows:

Check for Accommodation

The adjustment of the eye for seeing at different distances can be referred as accommodation. Another word for focusing is accommodation. To see objects both near and far, accommodation is a change in the curvature of the lens of the eye.



The objects that are close to the eye lens curves greatly to focus on that. The lens becomes flatter when a person focuses on the object far away. The object on which it is being looked at accommodates the eye lenses. The eye lens is controlled by the eye muscles which confirm whether the lens is curved or flattened by the ciliary muscle.



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Check Visual Acuity

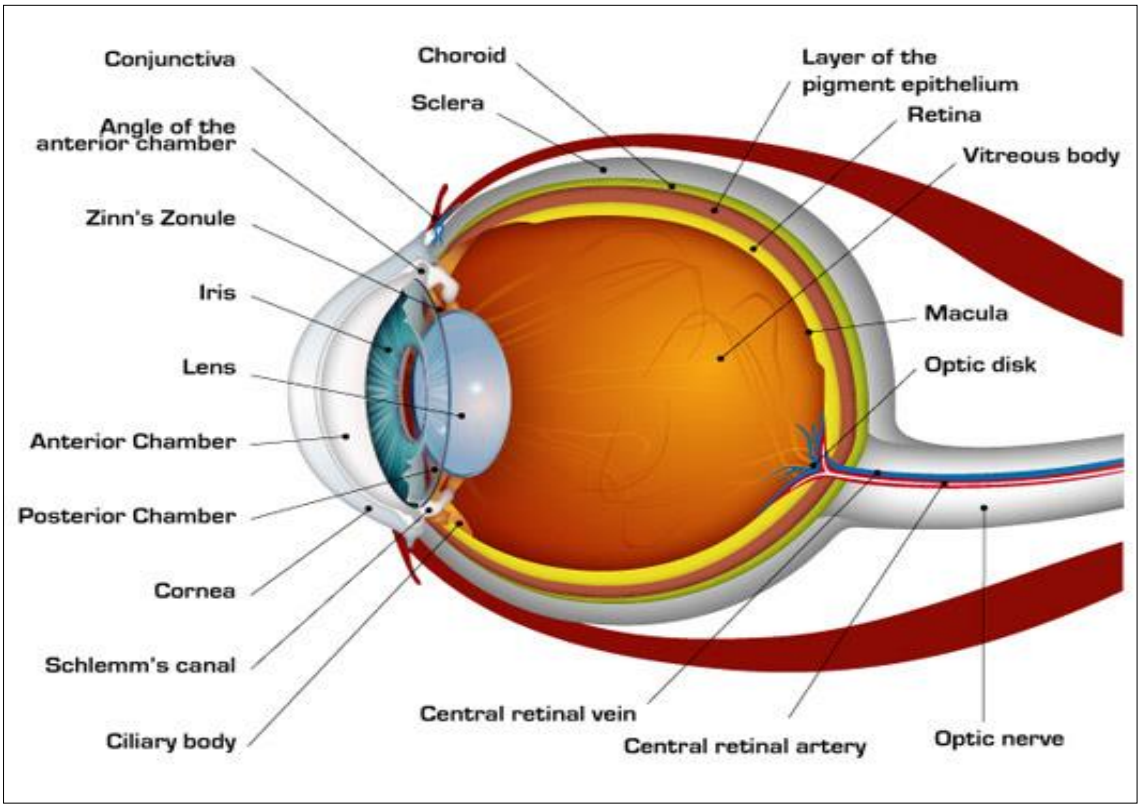
Clearness of sharp vision is visual acuity. A routine examination is mandatory in case of visual acuity for all patients. Several charts of test letters are used among which the commonly used is Snellen chart. From the chart the patient is seated twenty feet away. On the eye globe without putting pressure a clean card is placed in front of one eye.

With progressive small letters, the chart has many small rows. The patient is asked to read down the chart as fast as possible. A patient who can read the letters on the 20/20 line from a distance of 20 feet is said to have a vision of 20/20 vision in that eye. The same process is repeated for the other eye. The test should be repeated with his/her glasses if the patient normally wears glasses for distance and then the result is recorded as uncorrected or corrected.

Check for Colour Vision

Colour Vision Test:

A person's ability to distinguish primary colours and shades. The test method developed by Ishihara is the most common test conducted.



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Stilling and Hardy –Rand –Ritter

A series of plates made up of dots of the primary colours are all the tested looks which the person has tried are printed on the background of similar dots in a variety of colours. A person with normal colour perception can identify the pattern in which the dots are set up. A colour deficient person cannot identify the any patterns.

Examination of Eyes

Equipment

- ☐ Opaque card or occluder
- ☐ Snellen eye chart
- ☐ Jaeger card
- ☐ Penlight

Preparation

A patient is asked to be seated with their head up matching it up with doctor's eye level.

Subjective Data

Vision difficulty causes-Acuity which causes

- ☐ Night blindness
- ☐ Blurring
- ☐ Blind spots
- ☐ Floaters
- ☐ Halos or rainbows around objects
- ☐ Pain
- ☐ Redness, swelling
- ☐ Watering discharge
- ☐ Diplopia, strabismus
- ☐ Past hx ocular problems
- ☐ Allergies, surgery
- ☐ Glaucoma

Testing family history

- ☐ Uses of glasses or contact lenses
- ☐ Contact care
- ☐ Problems
- ☐ Effectiveness
- ☐ Last perception
- ☐ Selfcare behaviours
- ☐ Home and work environment
- ☐ Last eye exam
- ☐ Current medications
- ☐ Systematic or topical
- ☐ Eye medication

Assessment

Short Answer Questions

1. Explain night blindness.

_____

_____

_____

2. Describe the procedure of checking colour vision

_____

_____

_____

3. List the equipment used for eye examination

_____

_____

_____

_____

_____

_____

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for Assessment Activity.

Part – A

Differentiated between the following:

1. Night blindness and glaucoma

Part – B

Discussed in class the following:

1. Describe the various process of equipment
2. Illustrate the use of different machines for checking the eyes

Part – C

Performance Standards

The performance standards may include, but not limited to:

Performance Standards	Yes	No
Identified the equipment and instruments used for conducting eye		
Identified the different examination processes of eyes		

Session 4: Visual Assessment of Eye

In this session, you will learn about the basic visual assessment techniques.

Relevant Knowledge

Ophthalmoscopy is usually part of a routine eye test to screen for eye diseases. It looks at the back of the eye. The back of the eye is called the fundus. It consists of the following:

1. Retina
2. Optic disc
3. Blood vessels

This test may also be ordered if you have conditions that affect the blood vessels, such as high blood pressure or diabetes. Ophthalmoscopy may also be called fundus copy or retinal examination.

Ophthalmoscopy

Ophthalmoscopy is used to screen for eye diseases and conditions affecting the blood vessels. These include:

Diabetes

- ☐ Glaucoma (excessive pressure in the eye)
- ☐ Hypertension (high blood pressure)
- ☐ Macular degeneration (loss of vision in the centre of the visual field)
- ☐ Melanoma, a type of skin cancer, in the eye
- ☐ Cytomegalovirus (CMV) retinitis, an infection of the retina
- ☐ Damage to the optic nerve
- ☐ Retinal tear or detachment

Preparation

Doctor uses eye drops to dilate pupils. This makes them larger and easier to look through. However, these eye drops can make vision blurry and sensitive to light for a few hours. The patient should arrange for someone to drive you after the test.

If the patient is in a job that requires a clear vision, such as operating heavy machinery, then the patient should arrange to take the rest throughout the day. The patient should also bring sunglasses which will protect his/her eyes from bright light after the pupils are dilated.

If the patient is allergic to any medications, it is important that he/she should tell the Ophthalmologist. Eye drops should not be used if you could have an allergic reaction. There is also the possibility that some medications could interact with the eye drops. Therefore, it is important to tell about all medications that the patient is taking. Finally, the patient should tell the

ophthalmologist if he/she has glaucoma or a family history of glaucoma. Most eye doctors will not use eye drops on a patient with suspected glaucoma. The drops can increase the fluid pressure in the eye too much.

Procedure

During the test, the patient may receive eye drops to dilate your pupils that may sting briefly for a few seconds. Drops can also cause an unusual taste in your mouth.

There are three different types of ophthalmoscopy. Your ophthalmologist may choose to use one or more of them. The goal is to get the best view of the back of your eye.

Direct Examination

For direct examination, the patient will be seated in a chair. The lights in the room are turned off. The Ophthalmologist will sit across to the patient and uses an ophthalmoscope to examine the eye.

An ophthalmoscope is an instrument that has a light and several small lenses for your Ophthalmologist to look through. Your ophthalmologist may ask you to look in certain directions as he or she looks at the back of your eyes. The bright light may be slightly uncomfortable and cause after images to appear. However, it should not cause pain.

Indirect Examination

This test allows the doctor to see the structures in the back of the eye in more detail. For this test, the patient will be asked to lie down or sit in a reclined position. The Ophthalmologist will have a bright light positioned around the forehead of the patient so light will shine in the eyes. A lens will be held in front of the eye. Then the doctor will hold the eye open to look into it. Pressure may also be applied to the eye with a small, blunt probe. This may be uncomfortable but should not be painful.

Slit-Lamp Examination

This procedure gives the Ophthalmologist the same view of your eye as an indirect examination, but with higher magnification. The Ophthalmologist sits with an instrument in front of the patient. There will be a place for the patient to place his/her chin and rest the forehead. This helps keep his/her head steady during the exam. A bright light will be turned on in front of the eye. The Ophthalmologist will use a microscope to look at the back of the eye.

The patient may be asked to look in different directions. The Ophthalmologist may use his or her finger to open your eye to get a better view. A small, blunt probe may also be used to apply

pressure to the eye. This examination may be uncomfortable, but it should not be painful. You may see after images after the light turns off. They should go away after blinking several times.

Risks

The only risk of ophthalmoscopy is that of having a reaction to the eye drops. Such reactions are rare. However, they may cause:

- ☐ Dry mouth
- ☐ Flushing
- ☐ Narrow-angle glaucoma
- ☐ Dizziness
- ☐ Nausea and vomiting

An eye exam is a series of tests typically performed by an ophthalmologist or optometrist to check vision as well as structures and functions of the eye. Examination of the eye is of paramount importance in diagnosis of eye disease.

Steps

Check Visual Acuity (VA): VA is the acuteness or clearness of vision, typically checked at a distance of 20 feet (6.1 m). VA is denoted by a fraction, with the numerator referring to the distance at which the tested eye can see, compared to the denominator, which refers to the distance at which a normal healthy eye can see. For example, a visual acuity of 18/20 means that the tested eye can see at 18 feet (5.5 m) that which a normal eye can see at 20 feet (6.1 m). The higher the denominator, the poorer the visual acuity of the tested eye. VA less than 20/20 may be due to refractive errors, or intrinsic eye disease.

A Snellen chart is commonly used to check VA. Check the VA in each eye individually, by covering one eye while testing the other. Check VA by first having the examinee wearing his or her corrective lenses (VAcc, where "cc" stands for cum correction), then re-check without correction (VAsc, where "sc" stands for sine correction). Finally check each eye individually and record results. In order to pass DOT, the examinee must have distant visual acuity of 20/40 in each eye w/ or w/o corrective lenses or distant binocular acuity of at least 20/40 in both eyes w/ or w/o corrective lenses.

Check Near Visual Acuity: Have the examinee read a card held approximately 14 inches (35.6 cm) away, at a normal reading distance. Use bright lighting during this test. Decreased near visual acuity may be caused by central cataracts or presbyopia, the latter affects most people after age 40, as the lens loses its ability to accommodate to focus at near with age.

Test peripheral vision by checking visual field: With index finger horizontal to each eye, move finger to lateral side until examinee

can no longer see it. He/she should have at least 70 degrees of vision in the horizontal meridian in each eye.

Test colour vision: Ask the examinee to look at the colours on the eye chart and identify them.

Test stereopsis: For depth perception by checking binocular vision and monocular vision. Depth perception is the visual ability to perceive the world in three dimension (3D). We do not have a specific test for depth perception but we do ask the patient if he is able to see with both eyes or with just one.

Eye Examination

Conjunctiva: Inspect the bulbar conjunctiva (on the globe) and palebral conjunctiva (on the internal aspects of the lids) for blood vessel, secretions, or redness, and presence of any foreign bodies or granulations. For the bulbar conjunctiva, note the colour of the underlying sclera, as well as any unusual vascularity and prominences.

Cornea: Inspect the cornea for deposits or defects, surface thinning, cloudiness, or presence of blood vessels invading the surface. Examine the tear film for both quantity and quality. Gently pull down the lower lid to check the quantity. A normal amount of tear film should leave 1-mm meniscus between the globe and the edge of the lower lid. Check the tear break-up time to check the quality of the outer oily layer to prevent evaporation.

Anterior Chamber: Check for presence of white blood cells floating in the aqueous humour, representing iritis, by focusing a thin oblique beam of light on the anterior chamber and observing passing cells (like dust particles seen in a projector's light path). Look for flare (scattering of the slit lamp beam), representing leakage of proteins into the anterior chamber. Cells and flare indicate anterior chamber inflammation, e.g., from uveitis. Check for presence of blood (hyphema), pus (hypopyon), and foreign bodies. Also check for presence of pigmented cells, indicative of pigment dispersion syndrome or possible retinal detachment. Check the clarity of the aqueous humour and the depth of the anterior chamber.

Iris: Note the colour of the iris colour, presence of any nevi or adhesion of the iris to the lens capsule (known as posterior synechiae), and any blood vessel growth on the surface (known as rubeosisiridis), which may occur in diabetes or other vascular diseases. The colour of the iris is due to amount and distribution of pigment in it. Persons with darker skin and hair tend to have darker irises as well. In albinism, the iris is translucent due to a lack of pigment.

Lens: Look for any lens opacities or cloudiness, which may indicate presence of a cataract.

Do a fundus exam: To see the fundus better, dilate the pupils by use of an eye drop containing an agent to dilate the eyes, such as atropine.

Carefully examine the following:

Macula: Look for any drusen (tiny yellow or white build-up of extracellular material in Bruch's membrane of the eye; an early sign of macular degeneration), micro-aneurysms, pigmentations, and foveal reflex (movement of light in the opposite direction to the movement of your ophthalmoscope, a result of the concave shape of the fovea). Absent of a foveal reflex may be due to drusens, retinal pigment epithelium (RPE) migration, or swelling, and may indicate age related macular degeneration (ARMD).

Vessels: Examine their appearance, calibre, presence of attenuation, and venule to arteriole diameter (normally 3:2). In hypertension, look for thickening of the arterioles (causing "copper-wire" or "silver-wire" appearance) and arteriovenous nicking (AVN) (constriction of the venule where it crosses a rigid arteriole hardened from long-standing hypertension).

Optic Nerve: Check for a sharp disc margin (blurred disc margin may indicate papilledema from increased pressure inside the brain), as well as any swelling or blood. Determine the cup-to-disc (C/D) ratio, which is used to monitor for progression of glaucoma. The disc is the eye's blind spot, where the optic nerve and blood vessels enter the retina; the cup is an area devoid of nerve fibres. Glaucoma destroys the nerve fibre layer of the retina, leading to increased cup-to-disc ratio as the disease progresses.

Assessment

Short Answer Questions

1. What is ophthalmoscopy?

_____
_____
_____
_____

2. What is the back of the eye called?

_____
_____

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity:

Part - A

Differentiated between the following:

Direct and indirect examination of eye

Part – B

Discussed in class the following:

1. What are the different types of ophthalmoscope?
2. Describe the process of eye examination by the physician?

Part - C

Performance Standards

The performance standards may include but not limited to:

Performance Standards	**Yes**	**No**
Inspected the position of the eyes in the orbits, the eyebrows and eyelids.		
Depressed the lower lids (or spread both lids) to observe the sclera and conjunctiva.		
Inspected the cornea and iris.		
Tested the direct reaction of each pupil to a bright light.		
Examined the optic disc, retina and anterior structures.		
Performed the ophthalmoscopic examination of the eyes.		

SECTOR: HEALTHCARE

HSVTO206-NQ2017: Medical Records

Student Workbook
(Class XI)

Table of Contents

Session 1: Storing and Maintaining Medical Records

In this session, you will learn the importance's of tracking medical records and how to maintain them.

Relevant Knowledge

A medical record helps to determine the course of health care. Medical records are so powerful that it shows the details of patient's medical history and identifies problems. A medical record is a living document that tells the details of the patient and facilitates each encounter they have with health professionals involved in their care.

To improve efficiency, co-ordination in team based, inter professional settings and facilitating research are done in a following ways:

- ☐ **Quality of Care**: By providing a detailed description of patient's health, status and a rationale for treatment decisions, medical records contribute to consistency and quality in patient care.

- ☐ **Continuity of Care**: Several health practitioners use the medical records. A medical record is not for the personal memory aid for the individual physician who has created it. The health care providers have got the provision to access quickly and understand the patient's past and current health status.

- ☐ **Assessment of Care**: The fundamental components of the medical care are:

    - External reviews
    - Investigations
    - Billing reviews
    - Physician self-assessment

Evidence of Care: Medical records are legal documents which provide civil, criminal, significant evidence in regulatory or administrative matters.

The medical records are kept in a secure environment, where access is restricted to authorised personnel.

Doctor usually keeps the electronic health records (EHR) which is similar to the personal health records (PHR). Most of the PHR demands the information to be done by scanning the documents or by typing in information by themselves. PHR are typically web based systems which is free and has a small subscription fee on the other hand the PHR is not at all connected to the employer, insurer and health system. Health outcomes are improved with the goal of increasing patient engagement offered by the organisations. Through a portal system many organisations offer patient a way to download their health information.

From health care providers, including doctor's, nursing homes, hospitals and pharmacies and health plan a copy of medical records are provided as it's a right of the patient called federally guaranteed right to see the medical records.

It is always wise idea to keep the copies of medical records.

Medical records are required during

- The change of doctor
- Get sick when one is away from home
- If away from home and fall sick then the treatment becomes safer and quicker

Records that should be maintained are as follows:

- Medical history
- Current health information
- A copy of advance directive, including a living will, and a power of attorney.
- Recent insurance claims and payments return records should be maintained.
- After the service data, the experts' advice to keep the records for another five years
- Along with the tax returns the records can be kept for 7 years if they are related to tax returns.

Doctors and nurses would write in the patients chart long years before. These notes are further added to the patient's ever expanding medical file, which was physically stored on the premises. There was no other way to store a patient's medical records until the digital age.

Instead of clipboards, when they hop into the exam room table maximum patients expect to see computers.

The majority of hospitals, doctor's, offices and medical centers nationwide will store health information electronically from 2014 onwards.

Electronic health records can also be termed as electronic medical records. It's a computerized collection of patient's health details. A patient's medical history, health insurance, billing information and other health related data are the information's stored within an EHR. If a patient finds a new health provider the information can easily be shared among a patient's various health providers within a facility, which can be quickly sent from one facility to the other.

How is information accessed?

Every hospital has their own way of EHR databases which is set up in such a way that it is accessible in every computer. With a user name, password or thumbprint identification can open a patient's health records, a doctor, a nurse or other health care provider would log into the system. By logging into their work system via; the internet and accessing the EHR providers can access the information remotely. Over the internet the systems are directly accessible.

Some of the points that need to be considered in storing medical records are as follows:

Important paper documents are kept in a fire proof safe

Papers are prevented from the damage caused due to pests, damp and floods.

For staff access is restricted in matter of password and encryption software.

Passing the records to another organisation is the disposal of records

The paper records should be shredded or incinerated. With random data, the CDROM'S, disks, Data should be overwritten. The hard drive can also be overwritten by the software with the random data. As such the destruction of the drive is possible and the fact that should be kept in mind is to keep and follow a written policy on that destruction of the records.

If the health information is in multiple places or in format, it becomes very difficult to keep a track on the medical records which further becomes a difficult task to use it. The harder the challenge becomes when working with several doctors to address with several health concerns.

Assessment

Shorts Answer Questions

What do you mean by Medical records?

_____
_____
_____
_____

What is EHR?

_____
_____

_____
_____

What is PHR?

_____
_____
_____
_____

What are the functions of the random data?

_____
_____
_____
_____

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity:

Part – A

Differentiated between the following:

Medical record and demographic information record

Part – B

Discussed in class the following:

Issues related to medical records

Part - C

Performance Standards

The performance standards may include but not limited to:

Performance	Yes	No
Demonstrated the ability to maintain written medical record using appropriate terminology and vocabulary		

Session 2: Maintaining Clinical Care Records

In this session, you will learn the role of a physician and the importance of keeping medical records.

Relevant Knowledge

A medical record depends upon a number of variables that affect the length of a time which is kept by the physician. Factors include state, federal laws, association and medical board and the type of records. To provide information on a patient's care to other health care professionals is the most important reason for keeping the medical records.

The physicians defence in the event of a medical malpractice action. The physician would not be able to show that the patient was receiving proper care or not without proper medical records. Retention laws of medical records and regulations differ from state to state. To defend the case, it is impossible rather difficult to emphasize once the record is destroyed. All records that reflect the clinical care provided to a patient, including provider notes, nurse's notes, diagnostic testing, and medication lists must be retained.

The same length of time is obtained from the retain records obtained from the other provider.

To the care provided, reference for the patient bill is reviewed. The care was provided or not is shown by the billing document. The bill can be kept for as long till the medical records is retained. To defend proper care, it is better to ensure the availability of records.

Purposes of keeping clinical records

Records of individuals are important for predicting or explaining the diseases that a person suffers from. Easy accessibility and transmittal of health data, continuity of care can be ensured between separate teams of service providers and between patients and the providers.

Clinical records are useful for the following purposes:

- For day today recording of patient care.
- Storage of chronological account of the patient's life.
- To enable the clinician to communicate.
- To help patients to get the illness allowance
- To inform medico-legal investigations
- To inform analysis of clinical activity.

Electronic Medical Records (EMR) and Electronic Health Records (EHR) are effective application of Information and Communication Technology (ICT) to improve the maintenance of health records services in India. Electronic medical record (EMR) is a digital version of the paper charts in the clinician's office. An EMR contains the medical and treatment history of the patients in one practice (single doctor clinics or hospitals). Electronic Health Record (EHR)

is defined by the International Organization for Standardization (ISO) as "a repository of information regarding the health status of a subject of care, in computer processable form". EHRs are a summary of the various electronic medical records that are generated during any medical/clinical event during the lifetime of the individual. EHRs can also remind providers when patients need immunizations, enable providers to send reminders to patients for preventive/follow-up care, and give providers access to clinical protocols.

Assessment

A. Fill in the blanks

1. A medical record depends upon number of _____.
2. Retention law of medical records differs from _____ to _____.
3. The physicians defence in the event of medical _____ action.
4. The bill can be kept for as long as the bill can be _____.

B. Short Answers Questions

1. What is medical record?

_____
_____
_____
_____

2. State any three reasons for maintaining medical records.

_____
_____
_____
_____

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity.

Part – A

Differentiated between the following:

Medical records and health records

Part – B

Discussed in class the following:

1. Maintenance of records in an eye care clinic
2. Purpose of maintaining clinical records.

Part – C

Performance Standards

The performance standards may include, but not limited to:

Performance standards	Yes	No
Described the reasons for maintaining medical records.		
Identified the various types of medical records		

Session 3: Maintaining Patient's Privacy and Confidentiality

In this session, you will learn about maintaining confidentiality of the patient.

Relevant Knowledge

All healthcare personnel are required to acquire, process, store, retrieve and transfer clinical, administrative and financial health information. Physicians must maintain the medical records of their patients for a period of three years. Failure to maintain medical records for three years and/or refusal to provide medical records within 72 hours of the request constitutes professional misconduct rendering the Physician liable for disciplinary action. Medical privacy involves informational privacy (e.g., confidentiality, anonymity, secrecy and data security); physical privacy (e.g., modesty and bodily integrity); associational privacy (e.g. intimate sharing of death, illness and recovery); proprietary privacy (e.g., self-ownership and control over personal identifiers, genetic data, and body tissues); and decisional privacy (e.g., autonomy and choice in medical decision-making) (https://cis-india.org/internet-governance/health-privacy.pdf).

Confidentiality is the right of an individual to have personal, identifiable medical information kept private. Such information should be available only to the physician of record and other health care and insurance personnel as necessary. Patient confidentiality means that personal and medical information given to a health care provider will not be disclosed to others unless the individual has given specific permission for such release. Because the disclosure of personal information could cause professional or personal problems, patients rely on Ophthalmologist to keep their medical information private. The most benign breach of confidentiality takes place when clinicians share medical information as case studies. When this data is published in professional journals the identity of the patient is never divulged, and all identifying data is either eliminated or changed. If this confidentiality is breached in any way, patients may have the right to sue. Physicians are increasingly being sued by patients whose information has been released without their permission. Even though the plaintiffs do not always prevail, the costs of legal action are burdensome to both sides.

The Indian Medical Council (Professional conduct, Etiquette and Ethics) Regulations, 2002 (Code of Ethics Regulations, 2002) sets the professional standards for medical practice. Physicians are obliged to protect the confidentiality of patients including their personal and domestic lives, unless the law requires their revelation, or if there is a serious and identified risk to a specific person and / or community or notifiable disease.

The modern version of the Hippocratic Oath states: "I will respect the privacy of my patients, for their problems are not disclosed to me that the world may know.". India does not have any dedicated law related to privacy of medical information. Though all

infringements can be complained to Medical Council of India. The personal information of the patient is part of the "right to privacy" (considered part of Article 21) and its infringement is punishable under law. Such a disclosure may also amount as "medical negligence" and be punished under the Consumer Protection Act.

Privacy violations in the healthcare sector that stem from policy and implementation gaps include: disclosure of personal health information to third parties without consent, inadequate notification to a patient of a data breach, unlimited or unnecessary collection of personal health data, collection of personal health data that is not accurate or relevant, the purpose of collecting data is not specified, refusal to provide medical records upon request by client, provision of personal health data to public health, research, and commercial uses without de-identification of data and improper security standards, storage and disposal. The disclosure of personal health information has the potential to be embarrassing, stigmatizing or discriminatory. Furthermore, various goods such as employment, life, and medical insurance, could be placed at risk if the flow of medical information were not restricted.

The greatest threat to medical privacy, however, occurs because most medical bills are paid by some form of health insurance, either private or public. This makes it difficult, if not impossible, to keep information truly confidential. Health records are routinely viewed not only by physicians and their staffs, but by the employees of insurance companies, medical laboratories, public health departments, researchers, and many others. If an employer provides health insurance, the employer and designated employees may have access to employee files.

Both the ethical and the legal principles of confidentiality are rooted in a set of values regarding the relationship between caregiver and patient. It is essential that a patient trust a caregiver so that a warm and accepting relationship may develop.

Assessment

1. What is patient's confidentiality?

_____
_____
_____
_____

2. Why personal information of a patient should not be disclosed?

_____
_____
_____
_____

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity:

Part - A

Differentiated between the following:

1. Privacy and confidentiality
2. Informational privacy and physical privacy

Part – B

Discussed in class the following:

1. Why confidentiality between patient and medical personnel is important?
2. What are the regulations that govern the confidentiality of patient's information?

Part - C

Performance Standards

The performance standards may include, but not limited to:

Performance standards	Yes	No
Described reasons for maintaining privacy and confidentiality of patient's medical record		

Session 4: Legislation and Acts related to Privacy Policy of the Patients

In this session, you will learn about the legislation to the particular disease and different acts related to the privacy policy of the patients.

Relevant Knowledge

Now that you have understood that the confidential information is any identifiable medical and demographic information that reveals the identity of the patient, such as name, address, telephone number, social security number, health identification number, or date of birth, let us now take a look at other aspect of it. There are certain situations where disclosure of personal health information is permitted. For example, in the following conditions, there are provisions for revealing the information subject to certain conditions governed by legislations:

1. During referral by a doctor to another doctor or specialist
2. When demanded by the court or by the police on a written requisition
3. Under Right to Information (RTI) Act 2005
4. When demanded by insurance companies as provided by the Insurance Act when the patient has relinquished his rights on taking the insurance
5. When required for specific provisions of workmen's compensation cases, consumer protection cases, or for income tax authorities
6. Disease registration
7. Communicable disease investigations
8. Vaccination studies
9. Drug adverse event reporting

Confidentiality is challenged in cases involving the diagnosis of certain diseases. A list of diseases related to confidentiality policy include the following:

Pre-disease

Pre-disease is a type of disease creep in which currently healthy people with risk factors for disease, but no evidence of actual disease, are told that they are sick. Pre-diabetes and pre-hypertension are common examples. Labelling a healthy person with pre-disease can result in overtreatment, such as taking drugs that only help people with severe disease, or in useful preventive measures, such as motivating the person to get a healthy amount of physical exercise.

Types

- ☐ Infectious diseases
- ☐ Contagious diseases
- ☐ Food borne illness

Food-borne illness or food poisoning is any illness resulting from the consumption of food contaminated with pathogenic bacteria, toxins, viruses or parasites.

- ☐ Communicable diseases
- ☐ Non-communicable diseases
- ☐ Airborne diseases

Mental disorders

Mental illness is a broad, generic label for a category of illnesses that may include affective or emotional instability, behavioural regulation, and/or cognitive dysfunction or impairment. Specific illnesses known as mental illnesses include major depression, generalized anxiety disorder, schizophrenia, and attention deficit hyperactivity disorder, to name a few. Mental illness can be of biological (e.g., anatomical, chemical, or genetic) or psychological (e.g., trauma or conflict) origin. It can impair the affected person's ability to work or study and harm interpersonal relationships. The term insanity is used technically as a legal term.

Organic diseases

An organic disease is one caused by a physical or physiological change to some tissue or organ of the body. The term sometimes excludes infections. It is commonly used in contrast with mental disorders. It includes emotional and behavioural disorders if they are due to changes to the physical structures or functioning of the body, such as after a stroke or a traumatic brain injury, but not if they are due to psychosocial issues.

Infectious diseases

In an infectious disease, the incubation period is the time between infection and the appearance of symptoms. The latency period is the time between infection and the ability of the disease to spread to another person, which may precede, follow, or be simultaneous with the appearance of symptoms. Some viruses also exhibit a dormant phase, called viral latency, in which the virus hides in the body in an inactive state. For example, varicella zoster virus causes chickenpox in the acute phase; after recovery from chickenpox, the virus may remain dormant in nerve cells for many years, and later cause herpes zoster (shingles).

Acute disease

An acute disease is a short-lived disease, like the common cold.

Chronic disease

A chronic disease is one that lasts for a long time, usually at least six months. During that time, it may be constantly present, or it may go into remission and periodically relapse. A chronic disease

may be stable (does not get any worse) or it may be progressive (gets worse over time). Some chronic diseases can be permanently cured. Most chronic diseases can be beneficially treated, even if they cannot be permanently cured.

Flare-up

A flare-up can refer to either the recurrence of symptoms or an onset of more severe symptoms.

Refractory disease

A refractory disease is a disease that resists treatment, especially an individual case that resists treatment more than is normal for the specific disease in question.

Progressive disease

Progressive disease is a disease whose typical natural course is the worsening of the disease until death, serious debility, or organ failure occurs. Slowly progressive diseases are also chronic diseases; many are also degenerative diseases. The opposite of progressive disease is stable disease or static disease: a medical condition that exists, but does not get better or worse.

Localized disease

A localized disease is one that affects only one part of the body, such as athlete's foot or an eye infection.

Disseminated disease

A disseminated disease has spread to other parts; with cancer, this is usually called metastatic disease.

Systemic disease

A systemic disease is a disease that affects the entire body, such as influenza or high blood pressure.

Assessment

Fill in the Blanks

1. There are certain situations where disclosure of personal health information is permitted, for example when demanded by _____ companies, as provided by the Insurance Act when the patient has relinquished his rights on taking the insurance.
2. An _____ disease is one caused by a physical or physiological change to some tissue or organ of the body.

3. In an _____ disease, the incubation period is the time between infection and the appearance of symptoms.
4. An _____disease is a short-lived disease, like the common cold.
5. A _____ disease is one that lasts for a long time, usually at least six months.
6. A _____ disease is a disease whose typical natural course is the worsening of the disease until death, serious debility, or organ failure occurs.
7. A _____disease is one that affects only one part of the body, such as athlete's foot or an eye infection.
8. A _____disease has spread to other parts; with cancer, this is usually called metastatic disease.

Checklist for Assessment Activity

Use the following checklist to see if you have met all the requirements for assessment activity:

Part - A

Differentiated between the following:

1. Communicable diseases and non-communicable diseases
2. Contagious diseases and organic diseases
3. Acute and chronic diseases

Part – B

Discussed in class the following:

Part - C

Performance Standards

The performance standards may include, but not limited to:

Performance Standards	Yes	No
Described the provisions available under various legislations and acts for challenging the confidentiality of patients		

Glossary

Accommodation	Ability of the eye to change its focus between distant objects and near objects.
Accommodation Disorder	It refers to the eye's ability to automatically change focus from seeing at a distance to seeing at near. Accommodation disorders have a variety of causes. Symptoms include blurred vision, double vision, eye strain, headache, fatigue and difficulty concentrating (particularly while reading). Presbyopia is an accommodation disorder that affects everyone if they become old enough, since its causes relate to the aging of the eyes.
Acetate	Type of plastic often used in eyeglass frames.
Angle (Drainage Angle)	Drainage area of the eye formed between the cornea and the iris, named for its angular shape, which is why you see the word "angle" in the different glaucoma names.
Anterior Chamber	Space between the cornea and the crystalline lens, which contains aqueous humour.
Aqueous Humour	Transparent fluid occupying the anterior chamber and maintains eye pressure.
Bifocal	Lens with one segment for near vision and one segment for far vision. The term "bifocal" can apply to both eyeglass lenses and contact lenses.
Binocular Vision	Ability of both eyes to work together to achieve proper focus, depth perception and range of vision.
Bioptic Telescopic Lenses	Devices attached to glasses that provide extreme magnification, typically used for driving. For people with low vision who are qualified, telescopic lenses are attached above the driver's line of sight to help magnify objects such as road signs.
Blepharochalasis	Excessive, drooping eyelid skin caused by recurring swelling. Blepharochalasis typically occurs in young people.
Blind Spot	The beginning of the optic nerve in the retina is called the optic nerve head or optic disc. Since there are no photoreceptors (cones and rods) in the optic nerve head, this area of the retina cannot respond to light stimulation. As a result, it is known as the “blind spot,” and everybody has one in each eye.
Carotenoid	A pigmented substance that adds colour such as red, orange, or yellow to plants. Carotenoids have antioxidant properties that protect cells against damage from free radicals, unstable atoms that can interact with and break down healthy tissue in different parts of the body including eyes.
Cavernous Sinus Problem	The cavernous sinus is located at the base of the cranium and contains the carotid artery and cranial nerves. Problems in the cavernous sinus

	include tumours, aneurysms and clots. Typical symptoms include ophthalmoplegia, chemosis and a bulging eye. You may also experience a red eye and vision loss.
Ciliary Body	An annular (ring-like) structure on the inner surface of the anterior wall of the eyeball, contained within the uveal tract and composed largely of the ciliary muscle and bearing the ciliary processes.
Eyelid	Either of the movable lids of skin and muscle that can be closed over the eyeball, providing eye protection and distribution of tears over the cornea while blinking.
Fovea	In the human eye the term fovea (or fovea centralis) is the "pit" in the retina that allows for maximum acuity of vision. The human fovea has a diameter of about 1.0 mm with a high concentration of cone photoreceptors.
Iris	The opaque muscular contractile diaphragm that is suspended in the aqueous humour in front of the lens of the eye; perforated by the pupil and continuous peripherally with the ciliary body; possesses a deeply pigmented posterior surface, which excludes the passage of light except through the pupil, and a coloured anterior surface which determines the colour of the eye
Kernel	When referring to a computer operating system, the kernel is the first section of the operating system to load into memory.
Limbus	Junction between the cornea and the sclera
Macula	The most sensitive part of the central retina, responsible for visual acuity and colour vision.
Vitreous Humour	The transparent gelatinous mass occupying the posterior compartment (the space between the crystalline lens and the retina of the eye) which is enclosed by a delicate hyaloid membrane; composed of water (99%), collagen fibrils, highly hydrated hyaluronic acid, halocytes, inorganic salts, sugar, and ascorbic acid; produced by halocytes located peripherally in the vitreous body.