# Computer: A Wonder Machine BOOK 7

## Chapter 1

## Number System—An Introduction

### 1. Answer the following questions:

- (a) The computer translates words and letters into numbers before storing, because computer understands only numbers. Therefore, we can say that computers talk and understand only numbers.
- (b) Number System are of the following types:
  - (i) Decimal Number System
  - (ii) Binary Number System
  - (iii) Octal Number System
  - (iv) Hexadecimal Number System
- (c) (i) Decimal Number System is a number system that we use in our day-to-day life.
  - Base for decimal number system is 10 as it uses 10 digits (0,1,2,3,4,5,6,7,8,9).
  - In all the number systems, the first digit is zero.
  - In all the number systems, the maximum value of digit is one less than the value of base.
  - It is also known as base-10 system.
  - In decimal number system, the successive positions to the left of the decimal point represent units, tens, hundreds, thousands and so on.
  - Digits signify different values depending on the position it occupies in the number.

For example, in (2789)10-

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9 signifies 9 \times 10^0 = 9 \times 1 = 9
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- 8 signifies  $8 \times 10^1 = 8 \times 10 = 80$
- 7 signifies  $7 \times 10^2 = 7 \times 100 = 700$
- 2 signifies  $2 \times 10^3 = 2 \times 1000 = 2000$

On adding them = 2000 + 700 + 80 + 9 = 2789

(ii) Binary Number System

The characteristics of binary number system are as follow:

• Binary number system has only two symbols or digits, *i.e.*, 0 and 1.

- Binary number system is also known as base-2 number system.
- Each position in a binary number represents a power of the base (2). Hence, the rightmost position is the units (2<sup>0</sup>) position. The second position from right is the 2's (2<sup>1</sup>) position, and proceeding in this way. For example, 10101 or (10101)<sub>2</sub> is
  - $= (1 \times 2^4) + (0 \times 2^3) + (1 \times 2^2) + (0 \times 2^1) + (1 \times 2^0)$
  - $= (1 \times 16) + (0 \times 8) + (1 \times 4) + (0 \times 2) + (1 \times 1)$
  - = 16 + 0 + 4 + 0 + 1
  - $= (21)_{10}$
- Binary equivalent of decimal digit 2 is 10 or  $(10)^2$ , read as one zero and not ten.
- With n bits (n positions) only 2<sup>n</sup> patterns are possible. (Binary digit is also referred to as bit)
- (d) (i) 455<sub>10</sub>

Repeated Division		Remainders	
2	455		
2	227	1	<b>N</b>
2	113	1	
2	56	1	
2	28	0	Write in this order
2	14	0	
2	7	0	
2	3	1	
2	1	1	
	0	1	

 $455_{10} = 111000111$ 

(ii) 79<sub>10</sub>

Repeated Division		Remainders	
2	79	_	
2	39	1	N Contraction of the second se
2	19	1	
2	9	1	
2	4	1	Write in this order
2	2	0	
2	1	0	
2	0	1	

$$79_{10} = 1001111$$

(iii) 1679<sub>10</sub>

Repeated Division		Remainders	
2	1679		
2	839	1	
2	419	1	
2	209	1	
2	104	1	Write in this order
2	52	0	
2	26	0	
2	13	0	
2	6	1	
2	3	0	
2	1	1	
2	0	1	
1050	11010001111	-	

 $1679_{10} = 11010001111$ 

(iv)  $1235_{10}$ 

Repeated Division		Remainders	
2	1235		
2	617	1	
2	308	1	
2	154	0	
2	77	0	Write in this order
2	38	1	
2	19	0	
2	9	1	
2	4	1	
2	2	0	
2	1	0	
2	0	1	

 $1235_{10} = 10011010011$ 

(e) (i) 111001<sub>2</sub>

32	16	8	4	2	1	
× 1	× 1	× 1	× 0	× 0	× 1	
32	16	8	0	0	1	
32 + 16 + 8 + 0 + 0 + 1 = 57						

Hence,  $111001_2 = 57_{10}$ 

(ii) 1010101<sub>2</sub>

64	32	16	8	4	2	1
× 1	× 0	× 1	× 0	× 1	× 0	× 1
64	0	16	0	4	0	1

64 + 0 + 16 + 0 + 4 + 0 + 1 = 85

Hence,  $1010101_2 = 85_{10}$ 

#### (iii) 110110<sub>2</sub>

32	16	8	4	2	1
× 1	× 1	× 0	× 1	× 1	× 0
32	16	0	4	2	0

32 + 16 + 0 + 4 + 2 + 0 = 54

Hence,  $110110_2 = 54_{10}$ 

(iv) 111011<sub>2</sub>

32	16	8	4	2	1
× 1	× 1	× 1	× 0	× 1	× 1
32	16	8	0	2	1

32 + 16 + 8 + 0 + 2 + 1 = 59

Hence,  $111011_2 = 59_{10}$ 

### 2. Fill in the blanks:

- (a) Decimal number system
- (b) words, number
- (c) Binary number system
- (d) 1, 0
- (e) Bit
- (f) Base-8 number system
- (g) Hexadecimal number systems

#### 3. Match the following:

- (a) (iv) Decimal number system
- (b) (viii) Octal number system
- (c) (x) Hexadecimal number system
- (d) (i) Binary number system
- (e) (ii) 11001000<sub>2</sub>
- (f) (ix) 100110<sub>2</sub>
- (g) (iii) 27<sub>10</sub>
- (h) (v) 1101<sub>2</sub>
- (i) (vii) 1010100<sub>2</sub>

(j) (vi)  $10010_2$ 

### 4. Write T for true and F for false statements:

(a) F	(b) F	(c) F	(d) T	(e) T
(f) <b>F</b>	(g) T			

#### **5.** Tick ( $\checkmark$ ) the correct option:

- (a) (ii) 1100000110
- (b) (i) Base-10 system
- (c) (iv) Repeated division method
- $(d) \ (i) \ 1011001$
- (e) (i) 44
- (f) (ii) 1111010100
- (g) (iii) 92

# Chapter 2 Advanced Features of Excel

### 1. Answer the following questions:

- (a) Sorting means arranging the data in an ordered sequence in a systematic manner so that the analysis can be done easily.
- (b) We can sort the columns in two ways:
  - (i) Ascending Sorting is done from A-Z

Home tab $\rightarrow$  Editing group $\rightarrow$  Sort & Filter $\rightarrow$  Sort A to Z

(ii) Descending – Sorting is done from Z-A

Home tab $\rightarrow$  Editing group $\rightarrow$  Sort & Filter $\rightarrow$  Sort Z to A

- (c) Following options available in Print pane to print worksheet are:
  - Number of copies
  - Which sheets to be printed
  - Name of the printer
  - Size of the page
  - Orientation
  - Margins
  - With or without Scaling
- (d) Excel provides an interesting feature using which we can view rows of data (records) that suit a specified selection criterion. This feature is called filtering data. We can filter records from an identified range of data by defining a filter condition.
- (e) When we know the result and want to know the input value, at that time the Goal Seek feature is used. Therefore, we can say that goal seeking is the process of finding the correct input value when only the output is known.

## 2. Fill in the blanks:

- (a) Backstage view
- (b) Set cell
- (c) Advanced filter
- (d) (i) Ascending
  - (ii) Descending
- (e) Remove filter

### 3. Match the following:

- (a) (viii) A to Z sorting
- (b) (ix) Z to A sorting
- (c) (iv) Sort and Filter group
- (d) (vii) Rows with specified selection criteria
- (e) (vi) What if analysis
- (f) (iii) Sorting with multiple columns
- (g) (v) Backstage
- (h) (i) CTRL + SHIFT + L
- $(i) \ (ii) \ Forecast \ group$

### 4. Write T for true and F for false statements:

(a)	F	(b) T	(c) T	(d) T	(e)	Т
(f)	F	(g) T	(h) F	(i) T		

#### **5.** Tick $(\checkmark)$ the correct option:

- (a) (iv) Formulas
- (b) (i) Backstage
- (c) (iii) For value
- (d) (i) Goal Seek
- (e) (iii) Multiple
- (f) (i) Ascending order
- (g) (iv) Auto
- (h) (i) CTRL + SHIFT + L
- (i) (ii) Criteria range

# Chapter 3 Charts in Excel

#### 1. Answer the following questions:

(a) Charts are used to represent data in a graphic form. Charts are also called graphs. Charts are visually more appealing and make it easy for us to analyse and compare trends in data.

When we display information in charts and graphs, it is easier to understand and interpret the data. This makes the reporting process much easier and meaningful. We can present and analyse the information in a much more efficient manner.

- (b) (i) **Titles** The title should be such that it can clearly describe the purpose of the chart.
  - (ii) Horizontal Axis It is the x-axis of the graph. Horizontal axis of the chart is also known as category axis.
  - (iii) **Legends** It displays the colour representation of each data series in the chart.
  - (iv) Data Series Related data points on the chart form the data series.
  - (v) **Vertical Axis** It is the y-axis of the graph. Vertical axis of the chart is also known as value axis.
- (c) Steps for creating a chart:

The first step is to collect the data for which we want to create a chart. We will have to do the following steps to make a chart using this data.

- (i) Select the complete data range, including the column headings and row labels. This is our source data.
- (ii) Open the Insert tab and locate Charts group on the ribbon.
- (iii) The Charts group provides different types of charts.
- (iv) Select the desired chart category from the Charts group.
- (v) Click on the arrow below the selected chart category to select the chart type. Each chart category has different chart types.
- (vi) Select the desired chart type from the drop-down menu.
- (vii) The chart will appear in the excel sheet.
- (d) Two chart tabs added to the ribbon when we insert charts to MS Excel sheet:
  - (i) Design tab

After creating a chart, we can change its look by using the predefined options provided by MS Excel. Following groups appear under Design tab:

- Chart Layouts Help change the chart layout.
- *Chart Styles* Various chart styles options are displayed in this group. We can change the chart style as per our need.

- *Data* Allows us to switch between row and column using the same data. Select Data button opens the Select Data Source dialog box where we can interchange and add new entries to the source data.
- *Type* Helps change the chart type.
- Location Allows us to move the chart to different location.
- (ii) Format tab

Under this tab, formatting of the chart can be done. It provides the following groups:

- Current Selection Used for formatting the chart area.
- *Shape Styles* Provide style to the line or shape, fill solid colour and outline to the shape. Can also give special effects to the shapes.
- WordArt Style Provides WordArt styles to the text.
- Arrange Helps in arranging the chart data.
- Size Helps in changing the height and width of the chart.

(b) Insert

#### 2. Fill in the blanks:

- (a) Charts
- (c) Design, Format (d) Data
- (e) Quick Layout (f) Select data source
- (g) Fill & Line, Effects, Series options
- (h) Fill & Line, Effects, Size and Properties, Axis options
- (i) Move chart

#### **3. Write T for true and F for false statements:**

(a) 7	Г	(b) F	(c) T	(d) T	(e)	Т
(f) I	F	(g) T	(h) F	(i) T	(j)	F

#### 4. Tick ( $\checkmark$ ) the correct option:

- (a) (ii) Graphic form
- (b) (ii) Only A
- (c) (iv) Category axis
- (d) (i) Data Series
- (e) (iv) All of these
- (f) (i) Quick Layout option
- (g) (iv) Data Series
- (h) (iv) Series Options

# Chapter 4 Technologies of Tomorrow

### 1. Answer the following questions:

- (a) Self-fertilizing crops are plants that can make their own food without using artificial fertilizers. These crops can get the required nutrients from air and soil with the help of some friendly bacteria. The benefits of self-fertilizing crops for farmers and the environment are as follows:
  - a. These crops save farmers' money by reducing the need for fertilizers.
  - b. They reduce pollution by avoiding the use of artificial fertilizers.
  - c. They increase food production.
- (b) The advantages of on-demand drug manufacturing are:
  - a. It makes drugs more accessible and affordable for everyone, everywhere and every time.
  - b. It makes only the required quantity and reduces waste.
  - c. It improves security and quality by avoiding shortages, fakes and infections.
  - d. It enables innovation and customization by making new or personalized drugs.
- (c) E-skin is defined as a kind of electronic system that copies natural skin. Some of its features are:
  - 1. It is flexible.
  - 2. It is stretchable.
  - 3. It is a self-healing system.
  - 4. It can sense things like heat, pressure and movement.
- (d) The word "necrobotics" comes from the words "necromancy" and "robotics" which means the magic of bringing dead things back to life. It makes machines (robots) that can move and perform tasks by using dead animals and plants.
- (e) Some of the applications of brain-reading robots are as follows:
  - 1. They help people who have problems with speaking or moving their body.
  - 2. They can create images from our thoughts.
  - 3. They can understand what is going on in our mind.
  - 4. They can measure tiny changes in the electricity in human brain.

#### 2. Fill in the blanks:

- (a) xenobots
- (b) Energy-storing bricks
- (c) Brain-reading robots
- (d) necromancy, robotics

- (e) artificial fertilizers
- (f) pollution, environmental degradation
- (g) accessible, affordable
- (h) thoughts
- (i) pores
- (j) Living Robots

#### 3. Write T for true and F for false statements:

(a)	F	(b) T	(c) F	(d) F	(e) T
(f)	F	(g) T	(h) T	(i) <b>F</b>	(j) T

## 4. Write T for true and F for false statement:

- (a) (ii) Necrobotics
- (b) (ii) Biological machine
- (c) (i) Energy
- (d) (iv) Speaking or typing
- (e) (iv) All of these
- (f) (iv) All of these
- (g) (i) Talk to people, understand their emotions and respond

# Chapter 5 Internet—HTML

#### 1. Answer the following questions:

- (a) When we use a browser software and enter a website address, we are requesting for access to information that is published on the site. The computer which is requesting is called a 'client computer' and the computer that is providing the information is called the 'server'. When we ask a question to our teacher, we are requesting for information, thus we are a client and teacher who is answering our question and is giving us information is the server.
- (b) Some of the important features of HTML are as follows:
  - Creates a web page using tags.
  - Uses graphics and display text in different fonts, sizes and colour.
  - Enhances the presentation of the document using HTML elements.
  - Creates hyperlinks to navigate to different documents present on the web.
  - Displays data in a tabular form.
  - Creates multiple windows on a web page.

(c) In HTML, the syntax used is called Tags.

Tags are enclosed within angular brackets: < and >. There are many predefined tags in HTML, which are used for specific purposes while writing programs. The programs that we create using HTML, when called using a browser, are called HTML documents. HTML programs are created with the help of, these tags. Tags start or open with <....> and end or close with </....>.

These tags define the type of document.

(d) There is a specific structure that needs to be followed while writing a program in HTML. This structure is defined by the World Wide Web Consortium. Example of a standard structure that needs to be followed is given below: <HTML>

<HEAD>

<TITLE>

<!Window title is written here-->

```
</TITLE>
```

</HEAD>

```
<BODY>
```

<!--Page content is written here-->

</BODY>

</HTML>

Each HTML program should have the following tags:

- <HTML> .....</HTML> : <HTML> tag helps the browser to know that the HTML code starts from here and </HTML> tag tells the browser that the HTML code ends here in the program.
- <HEAD> ......</HEAD> : This indicates the first part in HTML code. It contains the title tag.
- <TITLE>......</TITLE> : This helps us in writing the Title of the document. It gets displayed on the title bar of the window.
- <BODY> ......</BODY> : This is the main part of our HTML document. The contents of the page are written within this tag.
- (e) Tags are of two types:
  - **Paired tags**-A tag is said to be a paired tag if the text is placed between a tag and its companion tag. In paired tags, the first tag is referred to as Opening Tag and the second tag is referred to as Closing Tag.

For example,

<H>Heading of a document </H>

• **Unpaired tags**-An unpaired tag does not have a companion tag. Unpaired tags are also known as Singular or Stand-Alone Tags.

For example,

<br> <hr>

(f) (i) Short form of a web browser is a browser. A browser is a software application used to locate, retrieve and display content on the World Wide Web.

It includes web pages, images, video and other files. As a client/server model, the browser is the client run on our computer. It contacts the web server and requests for the information. The web server sends the information back to the browser, which displays the results on our computer screens.

- (ii) Web page: A web page is a document or a page on the World Wide Web (www). Each web page has its unique URL. It consists of information in the form of text, images, audio, videos and hyperlinks.
- (iii) Website: A website is a collection of related web pages. With the help of a web browser, we can open websites.

#### 2. Fill in the blanks:

- (a) Web pages
- (b) < and >
- (c) <HEAD>...</HEAD>
- (d) Title bar
- (e) Hypertext Transfer Protocol (HTTP)

#### **3.** Tick $(\checkmark)$ the correct option:

- (a) (iii) <H3> text heading </H3>
- (b) (ii) 6 levels
- (c) (ii) META
- (d) (iii) TOPMARGIN
- (e) (ii) Google Chrome
- (f) (i) SUBSCRIPT
- (g) (iv) <P>...</P>
- (h) (iii) <Head>...</Head>
- (i) (iv) <BR>
- (j) (iii) <META> and <TITLE>

### 4. Write T for true and F for false statement:

(a)	Т	(b) T	(c) F	(d) T	(e) F
(f)	F	(g) T	(h) F	(i) F	(j) T

#### 5. Match the following:

- (a) (vii) Client
- (b) (iv) Server
- (c) (v) Protocol
- (d) (vi) Web pages

- (e) (i) HTML
- (f) (viii) Tag with angular brackets
- (g) (x) <BODY>...</BODY>
- (h) (ix) Cascading Style Sheets
- (i) (ii) Line break tag
- (j) (iii) Paragraph tag

## Chapter 6 Introduction to Photoshop

#### **1.** Answer the following questions:

- (a) Photoshop is "a digital image-editing application". Photoshop provides features which help in photo editing, filtering, painting, masking, layering and many more tools. Photoshop CS6 software delivers state-of-the-art imaging magic, creative options, and fast performance. We can create superior designs as well as movies using these tools and workflows. Photoshop has many tools which can be used to perform various tasks.
- (b) Some of the features of Photoshop software are:
  - Photos can be corrected using Photoshop tools. We can adjust the colour and lighting in images. Photoshop provides exposure tool which can fix the lighting problems in images. The Shadows/Highlights tool is used to adjust the upper and lower color levels in an image. It can simulate the effect of lens filter on a photo that was taken without the use of one. It allows us to change one color with another, which changes the photo completely. It also allows us to create black-and-white picture from a colored image.
  - Photo enhancements can be done using Photoshop filters. The Smart Sharpen filter allows to fine-tune the sharpening effect. On applying blurring filter to the background of the photo softens the overall appearance of the image. Using Motion Blur makes the object in the photo appear to be moving. Noise reduction tool allows to remove the unwanted noise in the background of an image. Dust and damaged images can be repaired.
  - With the help of Photoshop tools, we can create one single image from multiple images. This helps us in creating seamless images and panoramas.
  - Provides artistic effect to our pictures. Photoshop allows us to transform our images using content-aware scale feature or Puppet wrap tool. The lens distortion can also be corrected by using Adaptive wide angle filter.
  - We can create digital paintings with Photoshop. Brush tools are available for editing and painting. We can also combine painting with photo editing. Photoshop provides brush panel, which enables us to create custom brushes.

- It allows to add text to the images in a bounding box. We can apply layer styles to the text. Using wrap option, we can create textual elements.
- We can create 3D objects and add texture to these 3D objects.
- Videos can also be edited and corrected by trimming, moving and splitting. We can even add images and 3D objects to files of video.
- Animation of images can be done using timeline panel. Photoshop allows us to tween in frame animation.
- (c) The main components of Photoshop window are:
  - **The Photoshop Menu bar**—Menu options provide quick access to the features, tools, commands in Photoshop using only a few mouse clicks. When we click any option on the menu bar, a drop-down menu appears with several other options. Each of these options performs specific tasks.
  - **The Workspace**—It is the area on the screen where we can view and edit the document. Multiple documents can be opened in the workspace. Each document is displayed in different tabs.
  - **Toolbox with options menu**—Toolbox provides easy access to all the tools. It includes tools in separate sections including Selection tools, Painting tools, Erasing tools, etc.
  - **Panels** in the Photoshop are similar to mini applications within the Photoshop window. They have their own menu options and controls. They are arranged as tabs.
- (d) We can save the settings for the future by clicking on Save Preset button. Next time when we want to add New Photoshop document of the same dimensions, we can select from the Preset dropdown. This will not only save our time but also will help in creating Photoshop document of same dimensions easily.
- (e) Photoshop provides various Selection tools which can be used to select and modify an image. Selections highlight areas of an image that we can modify leaving the rest of the image untouched with the help of these tools.

#### 2. Fill in the blanks:

- (a) Rectangular Marquee, Elliptical Marquee
- (b) Lasso
- (c) Quick Selection
- (d) Magic wand
- (e) Crop

#### 3. Match the following:



- (d) (vii) 🔭
- (e) (viii) 4
- (f) (i)
- (g) (iv)
  (h) (vi)
  (i) (iii)
  (j) (v)

#### 4. Write T for true and F for false statements:

(a)	F	(b) T	(c) F	(d) T	(e) F
( <b>f</b> )	Т	(g) F	(h) T	(i) T	(j) T

#### **5.** Tick $(\checkmark)$ the correct option:

- (a) (iv) Word processing
- (b) (i) Workspace
- (c) (ii) Panels
- (d) (ii) Toolbox
- (e) (iii) Calculation
- (f) (ii) Mini
- $(g) \ (iv) \ Font$
- (h) (i) Straight
- (i) (ii) Quick Selection
- (j) (ii) Crop

## Chapter 7 More on Photoshop

#### 1. Answer the following questions:

- (a) (i) Pen—The simplest path that we can draw with the Pen tool is a straight line, made by clicking the Pen tool to create two anchor points. By continuing to click, we can create a path made of straight line segments connected by corner points.
  - (ii) **Pencil**—Pencil tool works the same as the Brush tool. The only difference is that the strokes of Pencil tool have hard edges that do not blend with the surrounding image.

- (iii) Text—Text tool allows us to add text to an image.
- (iv) **Brush**—Brush tool allows us to apply painting techniques to repair, enhance and create images. The strokes of brush tool have soft edges, so that the edges blend slightly with the surrounding image.
- (b) Eraser tool is used to erase or remove elements from an image which are not required. Eraser tool changes all similar pixels to transparent. Photoshop CS6 provides three types of Eraser tools:
  - (i) **Standard Eraser Tool**—This Eraser tool erases the unwanted part from the image. It changes pixels to background colour. The tool uses the technique of "Click and Drag".
  - (ii) Background Eraser Tool—This Eraser tool erases the unwanted part from the image. It changes pixels to transparent. The tool uses the technique of "Click and Drag".
  - (iii) **Magic Eraser Tool**—When we click on an image, all the similar pixels change to transparent.
- (c) The Spot Healing Brush is the healing tool in Photoshop. We click on the blemishes which we want to remove and the spot healing brush works.
- (d) Clone Stamp tool is used to remove unwanted elements from an image or add elements to the image. Cloning involves copying an area from an image and painting it in the same image. It blends the pixels from the sampled area with the target area. The basic principle is that the texture from the sample area is blended with the colour and brightness surrounding the area where we paint.
- (e) Pattern Stamp tool allows us to apply a style pattern to an image using the brush stroke technique.

#### 2. Fill in the blanks:

- (a) Pencil
  (b) Cloning
  (c) Pattern Stamp
  (d) Gradient
  (e) Paint bucket
  (f) Blur
  (g) Dodge
  (h) Pen
  (i) Path Selection
  (j) Text
- 3. Match the following:



### 4. Write T for true and F for false statements:

(a)	Т	(b) T	(c) F	(d) T	(e) T
(f)	F	(g) F	(h) T		

## **5.** Tick $(\checkmark)$ the correct option:

- (a) (i) Healing(b) (ii) Pen(c) (i) Clone Stamp(d) (ii) Pattern Star
- (c) (i) Clone Stamp(d) (ii) Pattern Stamp(e) (i) Standard(f) (ii) Background
- (i) (iv)

(g) (iv)

(h) (i) Rotate

# Chapter 8 Database and DBMS—An Introduction

#### 1. Answer the following questions:

- (a) A database is an organized collection of structured information, or data, typically stored electronically in a computer system.
- (b) RDBMS stands for Relational Database Management System. RDBMS is a type of DBMS in which the database is organized and accessed according to the relationship between data values of fields in tables. Tables in the database are related to each other with the help of a common identified field. The connection between such tables is called **relation**. Access 365 is an example of RDBMS.
- (c) Following are the contents of a table:
  - **Data Fields:** Columns are known as data fields or just fields. Each field contains data of one type. It is a good practice to name the field according to the data it will hold. For example, in a students table, we can have fields like Roll Number, Student's Name, Class and Section which are self-explanatory.
  - **Records:** Data in a single row is known as a record. A record gives complete information about a unit. For example, a record gives details of a student.
  - **Data Item:** Data stored in one cell is known as a data item. All the data items in a single row form a record.
  - **Primary Key:** The column 'Roll Number' has unique values. No two students can have the same roll number in a school. It is important to have a field that uniquely identifies a record in a table. A field that stores such unique values is termed as the Primary Key field. Once we define a field as a primary key, Access ensures no two data items in that field can contain the same value in that table.

(d) **Primary Key**—In a table, we should have one or more fields whose value(s) uniquely identify a record. Such a field (or set of fields) is known as the Primary key for a table. Primary key cannot have a null value (undefined value).

Primary Key	Foreign Key
Primary key uniquely identifies a	Foreign key is a field in the table,
record in a table.	that is, primary key in another table.
Primary key can't accept null values.	Foreign key can accept multiple null values.
We can have only one primary key in a table.	We can have more than one foreign key in a table.

(e) Access provides us with an important feature which helps us in retrieving data from one or more tables. We can write a query statement by providing select or search conditions to get the desired data from multiple tables.

Queries are of the following types:

- (i) Simple Query: Simple query is the select query. It gets data from one or more tables and the result is displayed in datasheet view.
- (ii) Crosstab Query: Used for calculation and restructuring of data for better analysis.
- (iii) Find Duplicates Query: This query finds duplicate records within a single table or previously created query.
- (iv) Find Unmatched Query: This query is created to find records in one table that do not match records in a related table.
- (f) (i) Form—Form is a graphical representation of a table. We can add, update and delete records in a single table or multiple tables using a form. We can manipulate the same information either through forms or directly in the table. If we change a record in a form, it will be changed in the table. Data is stored in a table and form is just a graphical representation of that. Form displays only one record on the screen while the navigation button is there to retrieve all records.
  - (ii) Queries—Access provides us with an important feature which helps us in retrieving data from one or more tables specified by some conditions. We can write a query statement by providing select or search conditions to get desired data from multiple tables.
  - (iii) **Table**—Access allows us to have one or more related tables in a database. Every table must have a table name. Following are the contents of a table:
    - *Data Fields:* Columns are known as data fields or just fields. Each field contains data of one type. It is a good practice to name the field according to the data it will hold. For example, in a students table, we can have fields like Roll Number, Student's Name, Class and Section which are self-explanatory.

- *Records:* Data in a single row is known as a record. A record gives complete information about a unit. For example, a record gives details of a student.
- *Data Item:* Data stored in one cell is known as data item. All the data items in a single row form a record.
- (iv) **Report**—A report is an effective way of presenting data as information either on screen or in a printed format. We can arrange the fields on the report and can display the information the way we want to see it.
- (v) **Master Table** A master table is a table which holds a single record for an entity. The data is relatively permanent in a master table.
- (vi) Transaction Table In a transaction table, multiple records of same data can exist. The transactions are the activities performed on the master tables. These activities are recorded in the transaction tables.
- (vii) **Referential Integrity** Referential Integrity is a system of rules that ensures that relationships between related tables are valid and no records are deleted or changed accidentally.

#### 2. Fill in the blanks:

- (a) Data redundancy (b) Relational Database Management System
- (c) Reports
- (d) Data item, record
- (e) Primary key
- (f) Foreign key
- (g) ACCDB
- (i) Form, tables
- (j) Navigation pane

(h) Redundancy, inconsistency

(k) Datasheet

## 3. Tick ( $\checkmark$ ) the correct option:

- (a) (i) DBMS
- (b) (iii) Data Redundancy
- (c) (ii) Authorization Check
- (d) (i) Storage containers
- (e) (iv) Forms
- (f) (iv) Referential Integrity
- (g) (ii) Relationship Section and Selection Criteria Section
- (h) (iii) Data Field, Data item, Records
- (i) (i) Query
- (j) (iv) Defining purpose of database

# Chapter 9 Audio-Visual Communication

## 1. Fill in the blanks:

- (a) Information
- (b) Audio-Visual
- (c) OpenShot
- (d) Quick Access Toolbar
- (e) Three function tabs
  - (i) Project files
  - (ii) Transitions
  - (iii) Effects
- (f) Preview window
- (g) Timeline
- (h) CTRL+S
- (i) .osp
- (j) Single video file

## **2.** Tick $(\checkmark)$ the correct option:

- (a) (i) Project Files Pane
- (b) (iii) Quick Access Toolbar
- (c) (iv) Zoom Slider
- (d) (i) Imported
- (e) (iv) Preview Window
- (f) (iii) Edit
- (g) (ii) Smooth fade between images
- (h) (iii) 🖿
- (i) (iv) .osp
- (j) (i) Single video file

#### **3.** Write T for true and F for false statements:

# Chapter 10 Program Coding

#### 1. Answer the following questions:

- (a) (i) Code: Computer code, also known as program code, is the set of instructions written in any programming language. A computer can execute this code or program.
  - (ii) Program: A computer program is a sequence of instructions written using a Computer Programming Language to perform a specified task by the computer.
  - (iii) Programming Language: Specially designed languages used to write the commands are known as Programming languages. These languages help us to communicate with the computer language, *i.e.*, the machine language. The various programming languages, some of which are in use today, are BASIC, QBASIC, Visual Basic, C, C++, VC++, Java, etc.
  - (iv) **Execute:** Execution is a process by which we can execute the programs to obtain the desired result.
- (b) Programming involves the following activities:
  - (i) Problem analysis
  - (ii) Understanding of the problem
  - (iii) Generating algorithms
  - (iv) Implementation, *i.e.*, coding of algorithms in a target programming language
  - (v) Testing
  - (vi) Maintenance
- (c) The basic components of a program are:
  - (i) Identifiers (ii) Literals
  - (iii) Data types (iv) Operators
  - (v) Loops (vi) Decision-making
- (d) Naming conventions are the set of rules for choosing the character sequence to be used for identifiers. Following are the naming conventions to be followed:
  - (i) The first character must be a letter.
  - (ii) Names can have alphabets and numbers in any sequence.
  - (iii) The underscore (\_) counts as a letter.
  - (iv) The alphabets or names cannot contain a space.
  - (v) Upper case letters are different from lower case letters, *i.e.*, it is case sensitive.
  - (vi) Identifier name cannot start with a number.

- (vii) The name cannot contain special characters other than A-Z, a-z or underscore.
- (viii) Keywords cannot be used in names. Keywords are the special words which are reserved and have special meaning.
- (e) Literals are the constants that never change their value during program execution. Literals are of the following types:
  - (i) **Boolean:** Boolean means the value is either true or false. True means 1 and False means 0.

For example:

X = False

Where X is a variable and false is a constant.

(ii) **Integer:** Integer constants are whole numbers. The integer constant cannot have decimal values.

For example:

 $\mathbf{X} = \mathbf{4}$ 

Where X is a variable and 4 is a constant.

(iii) **Character:** Character constants can contain only one character, enclosed within single quotes.

For example:

X = 'a'

Where X is a variable and 'a' is a constant.

(iv) **Floating:** These are also known as real constants because these numbers can be in decimal. Real constant must have at least one digit before decimal and one digit after decimal.

For example:

X = 4.6

Where X is a variable and 4.6 is a constant.

(v) **String:** String constants are multi characters, enclosed within double quotes.

For example:

X = "Computer"

Where X is a variable and "Computer" is a constant.

## 2. Fill in the blanks:

- (a) Data types are of two types:
  - (i) Fundamental
  - (ii) Derived

- (b) Computer memory locations
- (c) Initializing
- (d) Reliable, robust, usable, portable
- (e) Operators are of the following types:
  - (i) Arithmetic
  - (ii) Relational
  - (iii) Logical
- (f) Modulus
- (g) Logical
- (h) NOT
- (i) Assignment
- (j) Compilation

#### 3. Match the following:

- (a) (iv) Problem-solving technique
- (b) (v) =
- (c) (vi) !
- (d) (vii) &&
- (e) (viii) ||
- (f) (ix) >=
- (g) (x) %
- (h) (ii) \*
- (i) (i) /
- (j) (iii) Numbers with decimal

### 4. Write T for true and F for false statements:

(a)	F	(b) T	(c) T	(d) F	$(e) \ F$
(f)	F	(g) T	(h) F	(i) T	(j) F

## **5.** Tick $(\checkmark)$ the correct option:

(a) (i) 1	(b) (ii) Single

- (c) (iii) Derived (d) (iii) Initialize
- (e) (i) = (f) (i) Division
- (g) (ii) >= (h) (iii) Logical AND
- (i) (i) 24goodnews (j) (iii) Problem-solving

## 7. Machine Room Exercise:

(a)	Begin
	Numeric percentage
	In put percentage
	If percentage > $95\%$
	Display "Grade A1"
	Else if percentage < 94 && percentage > $85$
	Display "Grade A"
	Else if percentage $< 84$ & percentage $> 75$
	Display "Grade B1"
	Else if percentage $< 74$ && percentage $> 65$
	Display "Grade B"
	Else if percentage < 64 & & percentage > 55
	Display "Grade C1"
	Else if percentage $< 54$ && percentage $> 45$
	Display "Grade C"
	Else if percentage < 44 & percentage > $35$
	Display "Grade D"
	Else if percentage $< 34$
	Display "Grade F"
	End
(b)	Begin
	Numeric Age
	Input Age
	If the Age $\geq 14$
	Display "Yes, The user is the student of class VIII."
	Else
	Display an error message.
(c)	Begin
	Numeric Num1, Num2
	Input Num1, Num 2
	If $Num1 = Num2$
	Display "Num1 and Num2 are equal"
	Else II Numl > Num2
	Display "Num1 is greater than Num2"
	List Diaplay "Num? is greater than Num1"
	Find
	ыца

Begin Numeric WeekNum Input WeekNum If WeekNum = 1Display "Monday" If WeekNum = 2Display "Tuesday" If WeekNum = 3Display "Wednesday" If WeekNum = 4Display "Thursday" If WeekNum = 5Display "Friday" If WeekNum = 6Display "Saturday" If WeekNum = 7

Display "Sunday"

End

## Chapter 11 More about Python

### 1. Answer the following questions:

- (a) Python is a general-purpose programming language that can be used to build any kind of program. It is very simple, flexible and easy to understand. Python is widely used across the platforms. It is used to build not only desktop applications, web applications but also mobile applications.
- (b) Comment is the text added by the programmer while writing a code. Proper comments make code maintenance easier. They generally tell about the function of the code written. The compiler ignores these lines at the time of execution.
- (c) Python has defined some rules to name a variable. These are as follows:
  - (i) A variable name must start with a letter or the underscore character.
  - (ii) A variable name cannot start with a number.
  - (iii) A variable name can only contain alpha-numeric characters and underscores (a-z, 0-9, and \_).
  - (iv) Variable names are case-sensitive (age, Age and AGE are three different variables).

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(d)

(d) Operators are used to perform various operations on variables and values.

Operators in Python are of the following types:

- (i) **Arithmetic Operators:** Arithmetic operators are used with numeric values to perform mathematical calculations. For example, x + y.
- (ii) Assignment Operators: Assignment operators are used to assign values to the variables. For example, x = 5.
- (iii) **Comparison Operators:** Comparison operators are used to compare values. For example, x > y.
- (iv) Logical Operators: Logical operators are used to combine two or more conditional statements. For example, x < 5 AND x < 10.</li>
- (v) **Identity Operators:** Identity operators compare the memory locations of two objects. For example, x is y.
- (vi) **Membership Operators:** Membership operators are used to find out whether a value is a member of a sequence such as string or list. For example, x in y.

(vii) Bitwise Operators: Bitwise operators are used to compare binary numbers.

(e)	<b>Identity Operator</b>	Membership Operator	
	Identity operators compare the	Membership operators are used	
	memory locations of two objects.	to find out whether a value is a	
		member of a sequence such as string	
		or list.	
	Operator – is, is not	Operator – in, not in	

### 2. Fill in the blanks:

(a)	Variables	(b)	Equal sign (=)
(c)	Comments	(d)	Indentation
(e)	.py or .pyw	(f)	general purpose
(g)	String	(h)	Arithmetic
(i)	Modulus	(j)	Assignment

## 3. Write T for true and F for false statements:

(a) T	(b) F	(c) F	(d) T	(e) F
(f) F	(g) T	(h) T	(i) F	(j) T

#### 4. Match the following operators:

- (a) Arithmetic operators (+, -, \*, ? %, \*\*, //)
- (b) Assignment operators (=, +=, -=)
- (c) Comparison operators (==, !=, >, <, >=, <=)
- (d) Logical operators (And, or, not)
- (e) Identity operators (is, is not)
- (f) Membership operators (in, not in)

## **5.** Tick $(\checkmark)$ the correct option:

- (a) (iii) is
- (b) (ii) !=
- (c) (iv) Logical
- (d) (iv) =
- (e) (i) Increment the values with the value specified after = symbol.
- (f) (i) 3\*3\*3\*3
- (g) (ii) removed
- (h) (ii) Modulus
- (i) (ii) True
- $(j) \ (ii) \ A \ variable \ name \ can \ start \ with \ a \ number$

# Chapter 12 Types of Artificial Intelligence

## 1. Answer the following questions:

(a)	Strong AI	Weak AI	
	It can do anything that a human can do.	It can only focus on a few tasks at hand.	
	It learns from its own experience and makes its own decisions.	It follows human commands and rules for a specific purpose.	
	It has self-awareness and is conscious because of which it can understand and interact with other beings.	It does not have human consciousness although it may be able to simulate it sometimes.	
	It does not exist yet in the real world but only in fiction.	It exists today in phones, cars, TVs, games, etc.	

- (b) Artificial Intelligence can be classified based on the following factors:
  - (a) Complexity or capabilities
  - (b) Functionality
- (c) Here are some examples of Weak AI:
  - ➢ A voice-recognition software
  - > An email spam filter
  - $\succ$  A self-driving car
  - > A chess-playing program.

#### (d) (i) **Reactive machines:**

- $\succ$  These are the simplest type of AI.
- > They only react to what is happening right now.
- > They do not remember anything from the past or plan anything for the future.
- > They just follow a set of rules to do a specific task

#### (ii) Limited-memory machines:

- These are machines that can store some information for a short period of time.
- > They use this information to improve their performance on a task.
- > For example, a self-driving car is a limited-memory machine. It can remember things like the speed and distance of other cars, traffic lights and road signs. It uses this information to drive safely and smoothly.

#### (iii) Theory-of-mind machines:

- > These are machines that can understand the thoughts and feelings of other beings.
- > They can interact with them in a natural and social way.
- For example, a robot that can talk to a human and understand their emotions is a theory-of-mind machine. It can also express its own emotions and preferences.

#### (iv) Self-aware machines:

- $\succ$  These are machines that can be aware of themselves and their surroundings.
- > They can have their own goals and opinions.
- > They can also learn from their experiences and improve themselves.
- > For example, a robot that can recognize itself in a mirror and make decisions based on its own interests is a self-aware machine.
- (e) Some fictional examples of Strong AI are:
  - (i) HAL 9000 from the movie 2001: A Space Odyssey.

HAL 9000 is a supercomputer that controls the spaceship and communicates with the crew.

(ii) WALL-E from the movie WALL-E.

WALL-E is a robot that collects and compacts trash on the earth after humans have left the planet.

#### 2. Fill in the blanks:

- (a) Artificial General Intelligence (AGI) or Generalized AI
- (b) intellectual
- (c) Strong AI programs (d) Chess-playing program, self-driving car

(e)	Narrow AI	(f)	weak AI
( <b>g</b> )	HAL 9000, WALL-E	(h)	Limited-memory machines
(i)	Theory-of-mind machines	(j)	Self-aware machines

#### 3. Write T for true and F for false statements:

(a)	Т	(b) T	(c) F	(d) F	(e) T
(f)	F	(g) F	(h) T	(i) T	(j) T

## 4. Tick $(\checkmark)$ the correct option:

- (a) (i) A calculator that can perform mathematical functions quickly.
- (b) (iv) All of these
- (c) (i) Reactive
- (d) (ii) Limited-memory
- (e) (iii) Theory-of-mind
- (f) (iv) Self-aware
- (g) (ii) It can follow human commands and rules for a specific purpose
- (h) (iii) WALL-E from the movie WALL-E that collects and compacts trash on the earth after humans have left the planet
- (i) (i) They can perform tasks faster and more accurately than humans
- (j) (ii) A calculator that can perform mathematical calculations quickly