# Teacher's Manual

**Fiesta Learning**
*Big Ideas Simply Explained*

BLOCK 01
NODE 04
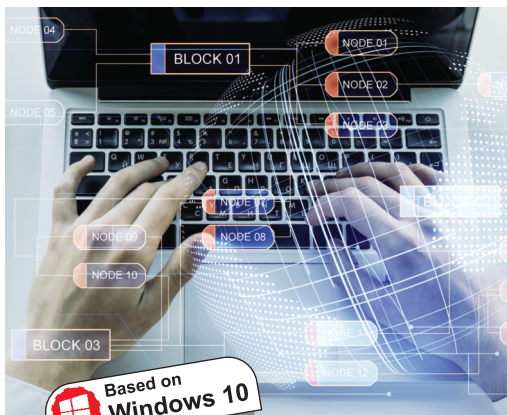NODE 01
NODE 02
NODE 05
NODE 09
NODE 08
NODE 10
BLOCK 03

**Based on Windows 10**

# CYBER
## TOOLS

*With Coding and Artificial Intelligence*

**Budding Series with
Play-way Methodology**

● Chatterjee
● Gupta

Designed by
Computer
Literacy
Experts

# Computer-6

## A. Multiple Choice Question (MCQ)

**Darken the correct option in OMR Sheet :**

**1.** (b)      **2.** (c)      **3.** (b)      **4.** (c)

## B. Tick (✓) for true statement and cross (✗) for false statement :

**1.** ✓      **2.** ✗      **3.** ✗      **4.** ✗      **5.** ✓

## C. Fill in the blanks using help box :

**1.** Language    **2.** program    **3.** High speed, low memory

**4.** Programming        **5.** 4GLS

## D. Write answers of the following :

**1.** A programming language is a special type of language that we can use to give instructions to the computer.

**2.** Machine language is the only language that a computer understands.

**3.** **Machine Language (First Generation):** It is the only language that a computer understands. It is expressed in binary form, i.e., '0' and '1' where 0 means 'Off' state and 1 means 'On' state.

**Assembly Language (Second Generation) :** The Assembly language is close to the Machine language but in assembly language, binary operation codes are replaced by the Mnemonics.

**4.** 4GLs are more programmer friendly than earlier generations of languages.
- 4GLs allow efficient use of databases and data processing.
- 4GLs allow a user to add specific system logic to existing code.
- 4GLs help to produce full systems with options like data structures, reports, and even program-specific logic.

5. **Interpreter:** Translator program is used to convert a high level language program into machine language. An Interpreter translates line by line, executes the instruction and then repeats the procedure for the remaining instructions. Interpreter programs are preferred for beginners and are slow in execution speed.

**Compiler:** Compiler is a translator program, used to convert a high level language program into machine language. A Compiler translates the whole program at once, i.e., it generates the object code for the program along with the list of errors. The execution speed of a compiler is faster as compared to an interpreter.

# 2 Operating System Windows–10

**A. Multiple Choice Question (MCQ)**

**Darken the correct option in OMR Sheet :**

**1.** (d)     **2.** (b)     **3.** (c)     **4.** (c)

**B. Tick (✓) for true statement and cross (✗) for false statement :**

**1.** ✗     **2.** ✗     **3.** ✓     **4.** ✗     **5.** ✓

**C. Fill in the blanks using help box :**

**1.** 2015     **2.** icons     **3.** Taskbar

**4.** bookmarks;     **5.** Virtual Desktop

**D. Write answers of the following :**

**1.** It appears at the bottom left corner of the Taskbar. When you click this button, a lists of options appears. This list is called the Start menu.

**2.** The File Explorer program, previously known as Windows Explorer, has been given a noticeable look in Windows 10. There are plenty of new tools though the basic layout and functionality will be familiar to anyone who has used Windows XP or later.

**3.** • Open the Settings window from the Start Menu.
   • In the settings window, point to your favourite settings (Network & Internet) and right-click.
   • On the small menu that appears, select Pin to Start.
   • Click Yes on the screen to confirm the action. After this, you will see the Network & Internet app directly in the Start Menu.

**4.** • Click the Start button.
   • Choose Power, Windows will display options to Sleep, Shut down and Restart.
   • Select Shut Down to shut down the computer.

**5.** One of the new features of Windows 10 is the addition of Virtual Desktops. This allows you to have multiple desktop screens where you can keep open windows organised.

   To add a virtual desktop, follow these steps:
   • Click Task View on the Taskbar.
   • Click the "New desktop" option on the lower-right corner. You can access or delete the new Desktop by clicking Task View again.

# ③ Advanced Features of MS Word 2016

**A. Multiple Choice Question (MCQ)**

**Darken the correct option in OMR Sheet :**

**1.** (c)    **2.** (b)    **3.** (c)    **4.** (b)    **5.** (c)    **6.** (a)

**B. Tick (✓) for true statement and cross (✗) for false statement :**

**1.** ✓       **2.** ✓       **3.** ✗       **4.** ✗       **5.** ✗

**C. Fill in the blanks using help box :**

**1**. Insert       **2**. Close       **3**. Mail Merge

**4**. main document   **5**. Mailings

**D. Write answers of the following :**

1. Headers and footers are parts of a document that contain special information such as the document title, company logo, any photo, page numbers and the total number of pages, etc.

2. To insert a Header :

   Step 1: Click on the Insert tab.

   Step 2 : Click on the Header option in the Header & Footer group. A gallery of header or footer design appears.

   Step 3: Select the header design you want. The outline of header or footer entry box appears at the top or bottom of the page. The Design tab also appears on the Ribbon.

   Step 4: Click on the Placeholders or Content Controls and type the desired information to be inserted as header. The Content Controls are enclosed in square brackets.

   Step **5:** After adding the header, click Close Header and Footer option on the Design tab or press the Esc key. You will notice that the header and/or footer appears at the top and/or bottom of the page.

3. Mail Merge feature is used to combine a data source with the main document. It saves our time and energy to send letters at multiple addresses.

4. The three main stages during the mail merge process are creating data source, creating main document and merging the data source with the main document.

5. Step 1: To create a new data source, click on Create under Type a new list. The New Address List dialog box opens. Fill the details of the recipients. The fields you do not require can be left blank.

   Step 2: Click on New Entry to get the blank form for the next recipient.

   Step 3: After typing all the entries, click on OK.

   Step 4: The Save Address List dialog box appears. Give a name to the list and save it.

Step 5: The Mail Merge Recipients dialog box shows the data you have entered. You can edit the details in it, if required. Then you can move to the next step in the Mail Merge Wizard.

Step 6: Write your letter is Step 4 of 6. Write the letter in the active window. To add recipient information in it, click its location in the letter and then click on the required options from the Mail Merge task pane. The selected fields will appear between '<<' and '>>' symbols in the main document.

Step 7: Click on Address Block in the Mail Merge task pane. The Insert Address Block dialog box appears. Select the required options by clicking on the check boxes and click on OK.

Step 8: Now click on Next: Preview your letters, 5 of 6. This will allow you to see the letters one after another by clicking on the icon. You can make changes to the letters by going back step by step. You can even exclude recipients if you want.

Step 9: Finally, to merge the document to the data source, click on Next: Complete the merge. This is the last step. In this step, you have the option to either Print the letters or Edit individual letters.

Step 10: Give the document a name and save it by clicking on the Save As option in the File menu.

# 4  Enhancing a Presentation

**A. Multiple Choice Question (MCQ)**

**Darken the correct option in OMR Sheet :**

**1.** (a)  **2.** (c)  **3.** (b)  **4.** (a)  **5.** (d)  **6.** (a)

**B. Tick (✓) for true statement and cross (✗) for false statement :**

**1.** ✓  **2.** ✗  **3.** ✓  **4.** ✓  **5.** ✓  **6.** ✗

**C.** **Fill in the blanks using help box :**
   **1**. Animation effect   **2**. Video Clips      **3**. Play
   **4**. Rehearse timing   **5**. three

**D.** **Write answers of the following :**
   **1.** An animation is a visual effect added to the objects on a slide (including text, pictures, shapes and so on) or to the slide as a whole.
   **2.** Slide transitions control how your presentation moves from one slide to another. Slide transitions can be very useful to enhance your presentations. They grab the audience's attention and make a presentation visually appealing.
   **3.** Click on the slide to which you want to add an audio clip of recorded sound. Make sure a microphone is connected to your computer. Follow these steps.
   Step 1: Click on the Insert tab.
   Step 2: Click on the down arrow under the Audio option in the Media group.
   Step 3: Click on the Record Audio option. The Record Sound dialog box appears.
   Step 4: Type a name for the audio recording.
   Step 5: Click the Record button to start recording.
   Step 6: Click the Stop button when you're finished recording. You can click the Play button to listen to the recording.
   Step 7: Click OK. The audio file gets inserted in the slide.
   **4.** Video clips can also be added from any CD-ROM.
   Step 1: Select the Insert tab. Click on the Video drop-down list in the Media group and select the Video on My PC option.
   Step 2: The Insert Video dialog box appears on the screen. Select the required clip. Click on the Insert option.
   Step 3: The Format and Playback tabs appear whenever you click on the inserted video. You can format the

inserted video by clicking on the Format tab and selecting various formatting options from it.

Step 4: Click on the inserted video clip and select the Play button below the video clip. The video will start playing. The timeline next to the Play button will begin to advance. Click anywhere on the timeline to jump to any part of the video.

5. Rehearse Timings is a useful feature that helps us to practice presenting the slide show. Using this feature, we can save the most appropriate timings needed to go through each slide and animation in the presentation during a slide show. These timings can then be used to run the slide show automatically for the audience.

6. While designing and running a presentation, the following points should be kept in mind:
   • Slides should be of a consistent design throughout the presentation.
   • Use graphics and pictures to make the presentation attractive.
   • Remove unnecessary information and graphics.
   • Use contrasting background and text colours.

# 5  Microsoft Excel 2016

A. **Multiple Choice Question (MCQ)**

**Darken the correct option in OMR Sheet :**
   **1.** (b)    **2.** (a)    **3.** (c)    **4.** (a)    **5.** (b)    **6.** (a)

B. **Tick (✓) for true statement and cross (✗) for false statement :**
   **1.** ✓    **2.** ✗    **3.** ✗    **4.** ✗    **5.** ✗    **6.** ✓

C. **Fill in the blanks using help box :**

| | | |
|---|---|---|
| **1**. header | **2**. editing | **3**. Cell |
| **4**. Formula Bar | **5**. Auto Fill | **6**. Ctrl + X |

**D. Write answers of the following :**

1. **Worksheet:** It is a work area made up of horizontal rows and vertical columns wherein you enter and work with data. When you open Excel, single worksheet is displayed. You can add more worksheets as and when required. An Excel worksheet contains 16,384 columns and 1,048,576 rows.

   **Workbook:** It is a collection of multiple worksheets stored under a single file name. When you save an Excel worksheet, you are actually saving a workbook. The Excel workbook is saved with the extension .xlsx.

| Selection | Steps |
|---|---|
| 2. To select a range of adjacent cells | • Click the first cell of the range and then drag to the last cell to highlight all the cells in between. |
| | • To select a large range of cells, select the first cell in the range, hold down the Shift key and then click the last cell of the range. |
| To select non-adjacent cells or cell ranges | Select the first cell or cell range. Hold down the Ctrl key and select the second cell or range of cells. Repeat these steps to select more cells or cell ranges if needed. |

3. Using Drag and Drop Method

   Step 1: Select a cell or a range of cells. Position the mouse pointer at the edge of the selected cells.

   Step 2: Notice that the pointer changes from a white cross symbol to move pointer symbol.

Step 3: Drag the selected cell or a range of cells to a new destination, and release the mouse button. The data will be moved to a new location.

4. The steps to change the contents of a cell completely are :

Step 1: Select the cell to be edited.

Step 2: Type in the new data into the cell.

Step 3: Press the Enter key or the Enter button on the Formula Bar to accept the changes.

5. The steps to insert a new row are :

Step 1: Click on the row heading to select the row above which you want to insert the new row.

Step 2: Click on the arrow next to the Insert option in the Cells group on the Home tab. A drop- down list is displayed.

Step 3: Click on the Insert Sheet Rows option.

The selected row is shifted down and a new row is inserted at its place.

6. Excel provides a wonderful feature for copying cell contents. The Auto Fill is the easiest method to fill data in cells automatically.

Step 1: Type January in cell B1.

Step 2: Position the pointer at the lower right corner of the cell.

Step 3: The mouse pointer changes into a thin black "+" cross.

Step 4: Hold down the left mouse button and drag the fill handle up to cell B5. Release the button.

Step 5: The months February to May would appear in the cells B2 to B5.

# 6  Algorithms and Flowcharts

A. **Multiple Choice Question (MCQ)**

**Darken the correct option in OMR Sheet :**

**1.** (b)     **2.** (c)     **3.** (b)     **4.** (b)     **5.** (a)

**B.** **Tick (✓) for true statement and cross (✗) for false statement :**
　　**1.** ✓　　**2.** ✓　　**3.** ✗　　**4.** ✓　　**5.** ✗

**C.** **Fill in the blanks using help box :**
　　**1**. looping　　　　　**2**. flowchart　　　　**3**. two
　　**4**. oval　　　　　　 **5**. Flow lines
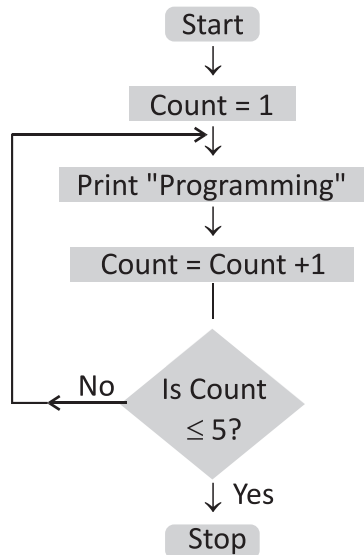
**D.** **Write answers of the following :**

**1.** Algorithm is a set of sequential steps to solve any logical or a mathematical problem. Algorithm is always written in simple language and precise manner so that anyone can understand the steps.

**2.** A flowchart is a diagrammatic representations of steps to be taken to solve a problem. Program flowcharts shows the sequence of instructions in a single program or subroutine.

**3.** Repeating a set of instruction till a specific condition is fulfilled is known as looping.

A loop is characterized by two things :
- Condition and
- Counter whose value is increased or decreased

Let us consider an example of looping in a flowchart. Consider the given flowchart that displays the word 'Programming' five times. The value of Count (counter) is initiated to one. It gets incremented by one every time it displays the word 'Programming'. The process of displaying the word and incrementing Count is continued as long as value of Count is less than or equal to 5 (condition). This is known as a loop. The loop comes to an end when the value of Count becomes 6.

Start → Count = 1 → Print "Programming" → Count = Count +1 → Is Count ≤ 5? — No (loop back to Print "Programming") / Yes → Stop

4. A Decision box is used to test conditions and take decisions. A condition can either result in a Yes/No or True/False. A Decision box is represented by a diamond shape.
5. A Process box is used to show actions or processes such as addition and subtraction. A Process box is represented by a rectangle.

## (7) QB64

A. **Multiple Choice Question (MCQ)**

   **Darken the correct option in OMR Sheet :**
   **1.** (c)　　**2.** (d)　　**3.** (c)　　**4.** (a)　　**5.** (a)

B. **Tick (✓) for true statement and cross (✗) for false statement :**
   **1.** ✓　　**2.** ✗　　**3.** ✗　　**4.** ✓　　**5.** ✗

C. **Fill in the blanks using help box :**
   **1**. program　　　　**2**. constant
   **3**. character set　　**4**. numeric value

D. **Write answers of the following :**
   1. QBASIC which stands for Quick Beginner's All Purpose Symbolic Instruction Code.
   2. A variable is a location in the memory, which has been assigned a name, and is used to store data temporarily. It continues to hold the value until another value is assigned to it.
      There are two types of variables :
      1. Numeric Variables,　2. Alphanumeric Or String Variables
   3. **Numeric Constants:** Any numeric value, either an integer or a real number, positive or negative is called a numeric constant.
      **Alphanumeric Or String Constants :** A set of characters is called a String. An alphanumeric or string constant consists of a sequence of characters, A-Z, a-z, 0-9 and certain special symbols, like % ? # & * ( ) ; : " /, etc., enclosed in double quotes.

4. When many operators are used in an expression, what will be the order of execution? In general, the expression is evaluated from left to right, but there are some other hierarchy rules that decide the order of calculation. Similar to BODMAS rule is applicable in maths, BEDMAS rule is applied to QBASIC expressions as follows:

| B | Brackets | () |
|---|---|---|
| E | Exponentiation | ^ |
| D | Division | / |
| M | Multiplication | * |
| A | Additional | + |
| S | Subtraction | — |

5. It is used to display any message or result on the screen. Any text written in double quotes is printed as such. Anything written without quotes is treated as a program components and its value will be displayed.
Syntax: PRINT "Message"
Print <Variable Name> Example: PRINT
"Welcome to the World of BASIC Programming."
It will display the message, Welcome to the World of BASIC Programming.
PRINT A
It will display the value stored in the variable A.
PRINT
It will leave a blank line.

# 8 Introduction to Flash CS6

## A. Multiple Choice Question (MCQ)

**Darken the correct option in OMR Sheet :**

**1.** (b)  **2.** (c)  **3.** (a)  **4.** (b)  **5.** (c)

**B.** Tick (✓) for true statement and cross (✗) for false statement :
   1. ✓   2. ✓   3. ✓   4. ✗   5. ✓

**C.** Fill in the blanks using help box :
   1. New          2. Tools Panel       3. polygon, Star
   4. Brush        5. Lasso

**D.** Write answers of the following :
   1. Animation is the technique of creating an illusion of movement by rapidly displaying a sequence of still images (with slightly varying positions/postures).

   2. Adobe Flash is a popular animation software used for creating animations, games and even full length animation movies complete with sound and special effects. Flash is specially suitable for creating animations for websites since the size of a flash movie is very small which makes them easy to upload and download.

   3. To create a new document, follow these steps:
   Step 1 : Click on File and then New.
   Step 2 : New Document dialog box appears.
   Step 3 : The New Document dialog box displays the file types you can create in Flash Professional.
   Step 4 : Click on the ActionScript 3.0 file type, if it is not already selected.
   Step 5 : Click on OK.
   Step 6 : The Adobe Flash new document window appears on the screen.

   Now you are ready to work with the master document, which uses the file extension .fla and thus called FLA file.

   4. The Paint Bucket tool fills enclosed areas with colour. It can fill empty areas and change the colour of already painted areas.
   Step 1 : Select the Paint Bucket tool.
   Step 2 : Choose a fill colour from the color tool box.
   Step 3 : Click the shape or enclosed area that you want to fill.

5. The Line Tool works exactly the same way as the Line tool in graphics software.
   The Pencil tool allows us to draw freehand lines just as we draw using a real pencil.

# 9 Internet Services

A. **Multiple Choice Question (MCQ)**
   **Darken the correct option in OMR Sheet :**
   **1.** (c)    **2.** (c)    **3.** (b)    **4.** (a)    **5.** (b)    **6.** (d)

B. **Tick (✓) for true statement and cross (✗) for false statement :**
   **1.** ✓    **2.** ✓    **3.** ✓    **4.** ✗    **5.** ✓

C. **Fill in the blanks using help box :**
   **1**. 1969          **2**. e-mail          **3**. modem
   **4**. web browser   **5**. compose

D. **Write answers of the following :**
   1. The World Wide Web (WWW or W3) is a system of interlinked hypertext documents accessed via the Internet. With a web browser, one can view web pages that may contain text, images, videos and other multimedia and navigate between them via hyperlinks.
   2. Social networking is possible in person, especially in the workplace, universities, etc. This is because most high schools, colleges or workplaces, the internet is filled with millions of individuals who are looking to meet other people, to gather and share share first-hand information.
   3. The first thing we need to connect to the Internet is a computer. Other than the computer, we also need a few more things.
      1. Modem,        2. Telephone Line,    3. ISDN Line,
      4. Internet Service Provider (ISP),       5. Web Browser
   4. E-Mail stands for Electronic Mail. It is a facility on Internet to compose, store, send, and receive messages to any part of the world. The convenience, simplicity, and affordability of sending

mails on Internet has totally changed the correspondence system.

5. To attach a file to an e-mail, follow these steps :

Step 1 : Click on the Attach a file icon on the toolbar at the bottom of the Compose window.

Step 2 : The Open dialog box will appear.

Step 3 : Browse through your files, and select the file you would like to attach.

Step 4 : Click on the Open button. The file gets attached to your mail. Now click on the Send button.

6. A signature is a bit of personalised text (such as contact information or a favourite quote) that is automatically inserted at the bottom of every e-mail you send. To create a signature, follow these steps :

Step 1 : Click on the gear icon in the upper right, then select the Settings option.

Step 2 : Enter your new signature text in the box at the bottom of the page next to the Signature option.

Step 3 : Click on the Save Changes tab.

## 10 Introduction to Python

A. **Multiple Choice Question (MCQ)**

**Darken the correct option in OMR Sheet :**

**1.** (a)          **2.** (a)          **3.** (b)          **4.** (b)

B. **Tick (✓) for true statement and cross (✗) for false statement :**

**1.** ✗     **2.** ✓     **3.** ✗     **4.** ✓     **5.** ✗

C. **Fill in the blanks using help box :**

**1**. interpreter          **2**. interactive          **3**. Function

**4**. F**5**          **5**. Keywords

D. **Write answers of the following :**

**1.** IDLE works in two modes-interactive and script.

- **The interactive mode**– is useful for running a single line of code. It displays the results automatically.
- **The script mode** lets you work with more than one line of code. You can save the file or script and run the code.

2. In computer programming, data types are used to store different types of data. A particular data type defines the type of operations that can be performed on the data.

   Following are the built-in data types of Python with examples.

| Date type | Description | Example |
|---|---|---|
| Number | It stores numeric values as well as floating-point (decimal) values. | 45, 82.5, 282727 |
| String | It stores a combination of letters within the quotation (" ") marks. | "Mike", "School", "hello" |
| List | it contains items separated by a comma. | [1, 2, 3, 4], [ 2, "kc", 86.5] |
| Dictionary | It contains keys with their corresponding values. | {'A' : 1, 'B' : 2 } |
| Tuple | It is similar to lists. The only difference is that it cannot be modified and is enclosed by parentheses (). | (1, 2, 3, 4) |

3. An identifier is a name given to a programming element. It helps in identifying individual elements.
- An identifier can be any combination of lowercase letters (a-z), uppercase letters (A-Z), digits (0-9),and underscores (_). For example, myVar, kc93, and hello_world are all valid identifiers.

- An identifier name can start with an underscore, For example, _john, _myClass1, and _ket876 are all valid identifiers.
- An identifier cannot begin with a digit. For example, 1var cannot be an identifier, but var1 is a valid identifier.
- Keywords cannot be used as identifiers.
- Special symbols (except underscore), such as $, #, and @, cannot be used in identifiers. For example, ket@js is an invalid identifier.
- An identifier name cannot contain any space.
- Identifier names are case-sensitive.
- Identifiers can be of any length.

4. **Assigning a Value to a Variable :** To assign a value to a variable, the assignment operator (=) is used. The general syntax for assigning a value to a variable is as follows :

variable_name=value

**For example :**

To store an integer value 10 to a variable named 'var', the statement will be as follows:

var=10

Some more examples are :

name="Rashmi" (Assigning a string value to the variable named 'name')

age=15.12 (Assigning a float-value, that is a decimal value, to the variable named 'age')

5. An operator is a symbol that represents an action, such as +, -, x, and÷.An operand is a number on which an operator acts.

The types of operators in the programming languages are :
- Arithmetic used for arithmetic calculations.
- Comparison used for comparing values.
- Logical used in logical calculations.

**Arithmetic Operators**

Listed below are some common arithmetic operators with the operations they perform.

| Operator | Operation | Example |
|---|---|---|
| + | Addition | 6 + 7 = 13 |
| – | Subtraction | 8 – 5 = 3 |
| * | Multiplication | 4 * 5 = 20 |
| / | Division | 20/4 = 5 |
| % | Modulus | 13%2 = 1 |

**Comparison Operators :** Listed below are the comparison operators used in programming languages. These operators are also called relational operators.

| Operator | Operation | Example | Result |
|---|---|---|---|
| > | Greater than | 5 > 3 | True |
| < | Less than | 3 < 7 | True |
| != | Not equal to | 4 ! = 4 | False |
| = = | Is equal to | 5 = = 6 | False |
| >= | Greater than equal | 5 > = 5 | True |
| < = | Less than equal | 4 < = 6 | False |

**Logical Operators :** A logical operator is used to combine two or more expressions and there are three logical operators' and, or and not.

| Operator | Description | Example (A=5, B=10) | Result |
|---|---|---|---|
| and | If both the values are true, the result is true. | A > B and A = B | False |

| or | If any of the two values is true, the result becomes true. | A < B or A > B | True |
|----|---|---|---|
| not | If an expression A is true then not A will be false and vice versa. | not A | True |

# (11) Artificial Intelligence

**A. Multiple Choice Question (MCQ)**

**Darken the correct option in OMR Sheet :**

**1.** (a)    **2.** (a)    **3.** (b)    **4.** (b)    **5.** (d)

**B. Tick (✓) for true statement and cross (✗) for false statement :**

**1.** ✗    **2.** ✓    **3.** ✗    **4.** ✓    **5.** ✓

**C. Fill in the blanks using help box :**

**1**. Visual perception, Speech recognition, Language translation

**2**. John McCartly      **3**. Kinect, Xbox 360  **4**. Apple

**5**. Knowledge representation   **6**. Machine learning

**D. Write answers of the following :**

**1. Google Home, a smart speaker:** Google released Google Home in 2016**.** It uses AI to act as a personal assistant helping the user by reminding tasks, creating appointments, and searching information by voice.

**2.** Spirit and Opportunity

**3.** ASIMO

**4.** Artificial Intelligence or AI refers to software technologies that give machines or robots the intelligence to perform tasks generally performed by intelligent beings. It is the ability of a robot or a machine to do tasks that usually require human intelligence. Speech recognition, decision-making, language translation, and visual perception are some examples of human intelligence that artificial intelligence may posses.

5. **In 1970s :** The 1970s saw an expansion of the computer era with the development of much quicker and affordable machines, with higher storage capacity. Their characteristics include abstract thinking, self-recognition, and could accomplish natural language processing.

   The development of the intelligent robot WABOT (Waseda robot) possessing human-like characteristics began in Japan at Waseda University.

6. **Rule Based Approach :** A rule-based system uses rules as knowledge representation. These rules are coded in the system in the form of if-then-else statements which help the computer in taking decisions. The idea behind a rule-based system is to use the knowledge of a human expert in a specialised domain and embody it within the computer system.

| | **1** | **Number System** |
|---|---|---|

**A. Multiple Choice Question (MCQ)**

**Darken the correct option in OMR Sheet :**

**1.** (c)  **2.** (c)  **3.** (b)  **4.** (c)

**B. Tick (✓) for true statement and cross (✗) for false statement :**

**1.** ✗  **2.** ✓  **3.** ✗  **4.** ✗  **5.** ✗

**C. Fill in the blanks using help box :**

**1.** Decimal  **2.** 0 and 1  **3.** bit

**4.** Subtraction  **5.** eight

**D. Write answers of the following :**

**1.** To convert decimal number into a binary number, follow the given rules:
- Divide the given decimal number with the base 2.
- Write down the remainder and divide the quotient again by 2.
- Repeat the step 2 till the quotient is zero.

**2.** Binary number system, is used by computers because a computer can understand only two states, i.e. presence and absence of the electrical pulse.

**3.** A binary digit, is called a bit. A series of eight bits makes a byte.

**4.** **Binary Addition :** The technique used to add binary numbers inside the computer is very easy and simple. This is performed in the same way as we perform addition with decimal numbers.

The following table illustrates the addition of two binary digits :

| a | b | a + b = c |
|---|---|---|
| 0 | 0 | 0 + 0 = 0 |
| 0 | 0 | 0 + 1 = 1 |
| 1 | 0 | 1 + 0 = 1 |
| 1 | 1 | 1 + 1 = 0 with 1 carry |

**Binary Subtraction :** The rules given in the table must be followed to perform binary subtraction.

| a | b | a − b = c |
|---|---|---|
| 0 | 0 | 0 − 0 = 0 |
| 0 | 0 | 0 − 1 = 1 (with borrow) |
| 1 | 0 | 1 − 0 = 1 |
| 1 | 1 | 1 − 1 = 0 |

5. The base of the following Number System:

| Number System | Base |
|---|---|
| Decimal | 10 |
| Binary | 2 |
| Octal | 8 |
| Hexadecimal | 16 |

# 2  Formulas and Functions in Excel

**A. Multiple Choice Question (MCQ)**

**Darken the correct option in OMR Sheet :**

**1.** (d)      **2.** (c)      **3.** (b)      **4.** (b)

**B. Tick (✓) for true statement and cross (✗) for false statement :**

**1.** ✗      **2.** ✓      **3.** ✓      **4.** ✗      **5.** ✗

**C. Fill in the blanks using help box :**

**1.** absolute      **2.** formula      **3.** equals

**4.** left right      **5.** Dollar sign

**D. Write answers of the following :**

1. A text string or a text value is a sequence of characters on which you cannot perform mathematical operations like addition, subtraction, multiplication, or division. However, you can join strings. Joining the strings is called concatenation.

2. Formulas are equations that perform calculations on values in your worksheet. You can make your own equation to perform certain calculation, e.g. 5 + 2 * 3. This formula multiplies 2 by 3 and then adds 5 to the result. To make it different from number entry we start typing a formula with an equal sign (=). For example: = 5 + 2 * 3

3. A reference identifies a cell or a range of cells in a worksheet, and tells Excel where to look for the values or data you want to use in a formula. A range of cells is referenced using a colon.

   A relative cell reference in a formula is based on the relative position of the cell that contains the formula, and the referenced cell.

   **Absolute Reference:** We put a $ sign before the column letter and before the row number to make the reference absolute. An absolute cell reference in a formula, such as $A$1, always refer to a cell in a specific location.

   **Mixed Reference :** A mixed reference has either an absolute column and relative row, or absolute row and relative column. We put a $ sign before the column letter or before the row number, whatever we want to make absolute.

4. In Excel, functions are defined as built-in formulas that are used to perform calculations or to return information about your spreadsheet data.

   (a) AutoSum                    (b) Average ()
   (c) Max () and Min ( )         (d) Count()

5. • Operations are carried out in the order in which they occur in the formula, which is left to right.

- Any operation contained in brackets will be carried out first, followed by any exponent (power).
- Then follow division and multiplication operations, which are given equal importance. Whichever operator appears first in the formula is carried out first.
- After that, addition and subtraction operations are given equal importance.

# 3   Creating Charts in MS Excel

**A. Multiple Choice Question (MCQ)**

**Darken the correct option in OMR Sheet :**

**1.** (b)     **2.** (a)     **3.** (c)     **4.** (b)

**B. Tick (✓) for true statement and cross (✗) for false statement :**

**1.** ✗     **2.** ✓     **3.** ✓     **4.** ✗     **5.** ✗

**C. Fill in the blanks using help box :**

**1.** Plot Area     **2.** Category     **3.** Pie

**4.** Column     **5.** Doughnut

**D. Write answers of the following :**

**1.** Gridlines, Chart Area, Plot Area, Data Table.

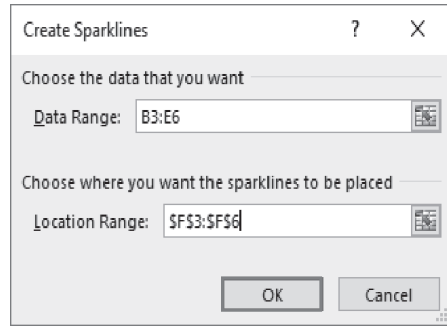**2.** Step 1 : Select the range of cells B3:E6 that contains the data.

| ◢ | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | | Average Temperature in May | | | | |
| 2 | Week (May) | 2012 | 2013 | 2014 | 2015 | Trend |
| 3 | 1 | 35 | 35 | 39 | 32 | |
| 4 | 2 | 36 | 37 | 42 | 34 | |
| 5 | 3 | 32 | 33 | 43 | 34 | |
| 6 | 4 | 34 | 36 | 41 | 36 | |

Step 2 : Select the Insert tab.

Step 3 : Click on the Line option under the Sparklines group.

Step 4 : The Create Sparklines dialogue box will open.

Step 5 : As the Data Range is already selected, select the Location Range where the sparklines are displayed. Select the cells F3:F6.

**Create Sparklines**

Choose the data that you want

Data Range: B3:E6

Choose where you want the sparklines to be placed

Location Range: $F$3:$F$6

OK    Cancel

Step 6 : The sparklines will be included in the sheet as shown in figure.

| File | Home | Insert | Page Layout | Formulas | Data | Re |

Edit Data ▾ | Line | Column | Win/Loss | ☐ High Point ☐ Low Point ☐ Negative Points | ☐ First Point ☐ Last Point ☐ Markers |

Sparkline | Type | Show

F3 | fx

| ▲ | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | | Average Temperature in May | | | | |
| 2 | Week (May) | 2012 | 2013 | 2014 | 2015 | Trend |
| 3 | 1 | 35 | 35 | 39 | 32 | |
| 4 | 2 | 36 | 37 | 42 | 34 | |
| 5 | 3 | 32 | 33 | 43 | 34 | |
| 6 | 4 | 34 | 36 | 41 | 36 | |
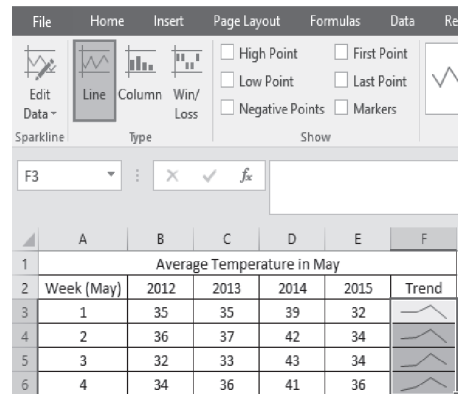
Step 7 : You can use the Design tab options for sparklines to highlight specific points by selecting the respective check boxes.

3. A legend indicates the nature of data displayed in a chart. For example, if two data series are displayed in a chart, the legend shows what each series contains. To add Legend, choose the Legend option from the Add Chart Element drop-down list and choose the appropriate option to display a legend for a chart from the submenu.

4. **Pie Chart:** Pie charts are used when we want to show the relationship of different parts of data to the whole data.

   **Doughnut Chart:** A doughnut chart is similar to a pie chart except that it can display more than one data series. A pie chart can display only one data series.

5. Gridlines are used for vertical and horizontal lines that make it easier to read a chart.

**A. Multiple Choice Question (MCQ)**

**Darken the correct option in OMR Sheet :**

**1.** (b)      **2.** (d)      **3.** (b)      **4.** (a)

**B. Tick (✓) for true statement and cross (✗) for false statement :**

**1.** ✓      **2.** ✓      **3.** ✓      **4.** ✗      **5.** ✓

**C. Fill in the blanks using help box :**

**1.** Frame      **2.** symbols      **3.** File      **4.** Keyframe

**D. Write answers of the following :**

**1.** The steps to convert an existing drawing into a symbol are :

Step 1 : Select the Selection (Arrow) Tool.

Step 2 : Draw a selection area around the object on the Stage to select it.

Step 3 : Select Modify > Convert to Symbol. The Convert to Symbol dialog box appears.

Step 4 : Type a Name for the symbol.

Step 5 : Select the type of symbol from the options Movie clip, Button, or Graphic. Here, we have selected Graphic.

Step 6 : Click OK. The symbol now gets added to the Library panel.

**2.** To rotate the selected object, position the pointer over one of the four corner handles.

When the pointer changes to a curved arrow, click and drag to rotate the object.

**3. Inserting a Frame or a Keyframe**

The steps to insert a frame or keyframe are :

Step 1 : On the Timeline, click on a rectangular placeholder where you want to insert a frame or a keyframe.

Step 2 : Select Insert > Timeline > Frame.

Or

Select Insert > Timeline > Keyframe.

4. In motion tweening, you specify the beginning and end position of an object and Flash automatically fills the frame in between. Usually, motion tweening works on symbols or groups of objects.

5. Layers are like transparent sheets of paper. You can draw different objects on each layer and make it appear on the stage whenever you want. Imagine that each image is a separate layer that has been drawn. They are placed on top of each other to create the illusion that everything was drawn on one sheet, but they are on separate layers.

# 5    Control Statements in QBasic

**A. Multiple Choice Question (MCQ)**
**Darken the correct option in OMR Sheet :**
   1. (a)      2. (c)      3. (c)      4. (c)

**B. Tick (✓) for true statement and cross (✗) for false statement :**
   1. ✓      2. ✓      3. ✗      4. ✓      5. ✗

**C. Fill in the blanks using help box :**
   1. Else instructions     2. statements     3. False

   4. True        5. Exit

**D. Write answers of the following :**

1. Conditional statements are used to execute a block of statements depending upon a condition. They help to control the flow of the program and hence are also known as control statements.

2. The IF...THEN statement is the most basic conditional statement and it is used to check conditions. If the condition is true then the statements written between IF...THEN and END IF are executed.

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For example, the following program prompts the user to enter age. It displays the message "You are allowed to vote" if the age is more than or equal to 18.

REM A program to check the age for voting

CLS

PRINT "Enter your age:"

INPUT Age

IF Age >= 18 THEN

PRINT "You are allowed to Vote"

END IF

3. A nested loop is a loop within a loop, an inner loop within the body of an outer loop. When the outer loop executes once, the inner loop executes to completion.

4. **Do While Loop:** This loop is executed as long as the specified condition is true. The Do While loop first executes the block of statements then checks the conditions.

Syntax:

DO

{

Statement(s)

}

LOOP WHILE Condition

**Do Until Loop:** This loop is similar to the Do While loop, but the only difference is that the execution of the loop continues as long as the condition is false. Syntax: DO UNTIL Condition

{

Statement(s)

}

LOOP

5. To end a loop prematurely, use the EXIT command, followed by either FOR or DO. Here is an example :
   FOR X = 5 TO 10
   PRINT X;
   IF (X = 8) THEN EXIT FOR
   NEXT X
   The output of this program will be 5    6    7    8

# 6    Introduction to HTML

A. **Multiple Choice Question (MCQ)**
   **Darken the correct option in OMR Sheet :**
   **1.** (c)        **2.** (c)        **3.** (b)        **4.** (b)        **5.** (d)
B. **Tick (✓) for true statement and cross (✗) for false statement :**
   **1.** ✗        **2.** ✗        **3.** ✓        **4.** ✗        **5.** ✓
C. **Fill in the blanks using help box :**
   **1.** HTML                **2.** attribute                **3.** title
   **4.** two                **5.** web browser
D. **Write answers of the following :**
   **1.** HTML is a language used for designing webpages. It is a language that describes the content, format and layout in which a webpage should be displayed over the World Wide Web.
   **2.** There are two types of HTML editors : WYSIWYG editors and text editors.
   **3.** • <HTML>                • <Body>
        • <Title>                • <Head>
   **4.** The first thing you should notice about these HTML tags, is that all tags include less than (<) and greater than (>) symbols on either side of the tags command. This is how HTML recognises tags. There are three types of tags:
        (a) Container Tags  (b) Empty Tags  (c) Comment Tags
   **5.** An attribute is a special keyword used inside the tag to specify additional information about the tag and customise it.

For example, <H1 align = "center">

In this example, 'align' is an attribute of <H1>. It indicated that the text inside the <H1> tag is to be displayed in the center.

Most attributes are optional and are only used when the default behaviour of a tag is to be changed.

# 7        Basic Tags in HTML

**A. Multiple Choice Question (MCQ)**
   **Darken the correct option in OMR Sheet :**
   **1.** (c)    **2.** (b)    **3.** (b)    **4.** (b)    **5.** (b)    **6.** (b)
**B. Tick (✓) for true statement and cross (✗) for false statement :**
   **1.** ✓      **2.** ✗      **3.** ✓      **4.** ✓      **5.** ✓
**C. Fill in the blanks using help box :**
   **1.** Bgcolor      **2.** No shade      **3.** face
   **4.** <I>      **5.** <P>
**D. Write answers of the following :**

**1.**

| Attribute | Description | Example |
|---|---|---|
| Bgcolor | This attribute is used to specify the background colour of the webpage. If you do not use the bgcolor attribute then the default background white. | <BODY bgcolor="green"> |
| Text | This attribute is used to specify the color of the text to be displayed on the web page. If you do not use the text attribute then the default colour of the text is black. | <Body text specify the colour of the "red"> |

**2.** The <br> tag is an empty tag, which means it does not have a closing tag. It is used to start a new line.

To display a long piece of text on a web browser, paragraph element <P> is used, which makes a block of text as a paragraph.

**3.**

| Attribute | | Description | Example |
|---|---|---|---|
| Size | Numbers in Pixels | It is possible to set the relative size of the text by setting the size attribute of the <font> tag. There are seven relative sizes for text, numbered from 1 to 7, where 1 is the smallest and 7 is the largest. The default size is 3. | <font size = "7" > text </font> |
| Face | Font name | The face attribute of the <font> tag is used to specify the type of font to be applied to the text enclosed between <font> and </font tags> . | <font face = "Times New Roman"> text </font> |
| Color | Color name | The color attribute of the <font> is used to specify the text enclosed between <font> and </font> tags. | <font color = "green"> text </font> |

**4.** These tags are used to define different heading levels in an HTML document. These are basically used to emphasize the text. There are six heading levels, H1 to H6. The H1 heading

style displays the text in the largest size and is mainly used for main headings. The lower levels are used for sub headings and less important things. It is not essential to use these heading levels in hierarchy. These heading tags are written within the <BODY> tag of the document.

5.

| Attribute | Description | Example |
|---|---|---|
| Noshade | Noshade To specify that the horizontal line should appear as a solid stripe accross the page, rather than a shaded stripe. | <HR noshade> |

# 8  Introduction to Photoshop CS6

**A. Multiple Choice Question (MCQ)**
   **Darken the correct option in OMR Sheet :**
   **1.** (a)       **2.** (c)       **3.** (d)       **4.** (a)

**B. Tick (✓) for true statement and cross (✗) for false statement :**
   **1.** ✓       **2.** ✗       **3.** ✓       **4.** ✗       **5.** ✓

**C. Fill in the blanks using help box :**
   **1.** image editing       **2.** .psd
   **3.** document window **4.** Tool Panel       **5.** Move

**D. Write answers of the following :**
   **1.** Adobe Photoshop is a powerful application for almost any kind of image editing and creating high-quality graphics. Photoshop has so many features that it used professionally to edit photos or graphics.

   **2.** It is used to select an image or part of it in a rectangular, square, elliptical or circular shape.

   Step 1 : Click on the Rectangular Marquee Tool in the Tools palette. The cursor appears as a cross- hair sign.

Step 2 : Place the cursor on the image. Click and hold the left mouse button and then



drag out a marquee to select the required part of the picture.
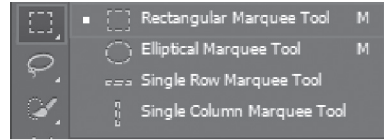
Step 3 : We will notice that a dashed border has covered the object, which we have selected as shown in the figure.

Step 4 : Press the Delete Key on the keyboard. A Fill dialog box appears.

Step 5 : Select Background color in the Use field and click OK. We will notice that the selected part of the image will be deleted.
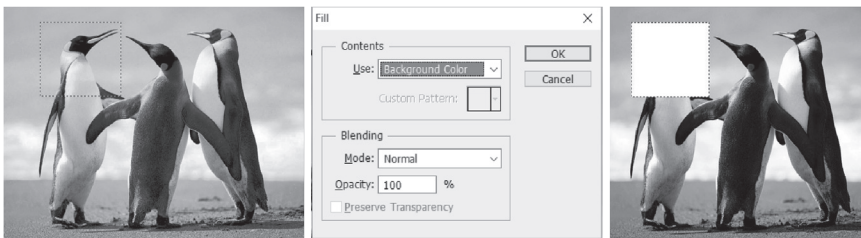


3. The Marquee Tool is used to select an image or part of it in a rectangular, square, elliptical or circular shape.
The Lasso tools are used to make free-hand selections in an image.

4. Panels help you to monitor and modify your work. For example, the Layers panel and Color panel which provides context-sensitive tools to make quick updates.

5. **Copying a Part of an Image:**
The Move tool allows us to quickly create a copy of our selection.

Step 1 : Select a part of an image using any selection tool.

Step 2 : Click on the Move tool.

Step 3 : Hold the ALT key and click and drag selection to a different location. We will see that a copy is created for us and moved to a new location.

**A. Multiple Choice Question (MCQ)**
**Darken the correct option in OMR Sheet :**
**1.** (d)      **2.** (b)      **3.** (a)      **4.** (d)

**B. Tick (✓) for true statement and cross (✗) for false statement :**
**1.** ✗      **2.** ✗      **3.** ✓      **4.** ✗      **5.** ✓

**C. Fill in the blanks using help box :**
**1.** malicious code      **2**. spread, replicate      **3**. Viruses
**4**. backdoor            **5**. pirated

**D. Write answers of the following :**

**1.** A virus is a small infectious agent that replicates only inside the living cells of other organisms. A computer virus is a program or piece of code that is loaded onto your computer without your knowledge and runs against your wishes.

**2.** Viruses can be classified by their infection targets into the following types:

1. Boot Viruses, 2. Program Viruses, 3. Macro Viruses

**Boot Viruses:** These viruses infect the boot record or master boot record. They replace the boot record that is responsible for loading the Operating System in the computer memory by copying it elsewhere. Boot virus becomes active at the time of booting the machine. Examples are Disk Killer, Stoned Virus, etc.

**Program Viruses:** These viruses infect executable files, programs, such as those with extension, like .com, .exe, .ovl, .drv, .sys, etc. These programs get loaded in the computer memory during execution. The virus becomes active in the computer memory by replicating itself and infecting files on the disk. Examples are Sunday, Cascade, etc.

**3.** The proper knowledge of viruses can keep your computer protected from the malicious attack of the viruses.

The following are the main causes of a computer virus :

**Infected Flash Drives Disks:** Flash drives and disks are the main cause of spreading viruses.

**Email Attachments:** Many viruses spread through emails. An email may contain an infected file attachment.

**Infected Websites:** There are many insecure websites those can infect computer with viruses.

**Networks:** Virus can spread if an infected computer is connected to a network. The internet is an example of such network.

**Pirated Software:** An illegal copy of software is called pirated software. A variety of pirated software is available in CDs and many are available to download from the internet.

4. • Take backup of your data regularly. An important way of precaution against virus is the use of backup of data. The backup is used if the virus deletes original data or modifies it.

   • Freeware and shareware software from the internet normally contain viruses. It is important to check the software before using them.

   • Your best protection is your common sense. Never click on suspicious links, never download songs, videos or files from suspicious websites. Never share your personal data with people you don't know over the internet.

5. A computer system can be protected from virus by following these precautions:

   • Antivirus software and firewall should be installed on the computer.

   • The antivirus software must be upgraded regularly.

   • USB drives should be scanned for viruses, and should not be used on infected computers.

   • Unknown emails should not be opened and must be deleted straight away.

   • Unauthorised or pirated software should not be installed on the computer.

**A. Multiple Choice Question (MCQ)**
**Darken the correct option in OMR Sheet :**
**1.** (a)          **2.** (d)          **3.** (a)          **4.** (a)

**B. Tick (✓) for true statement and cross (✗) for false statement :**
**1.** ✗          **2.** ✓          **3.** ✗          **4.** ✓          **5.** ✗

**C. Fill in the blanks using help box :**
1. python          **2**. open source          **3**. Logical Operators
**4**. Punctuators  **5**. reserved words  **6**. Arithmatical operations

**D. Write answers of the following :**
1. **Features of Python Programming :** Python is a simple and powerful language.

   Following are the features of python:

   **Open Source:** Python is an open-source language and can be easily downloaded from the Internet for free.

   **Portable:** Programs written in Python can run on almost every known platform such as Windows, Linux and Macintosh.

   **Libraries and Tools:** Programming in Python is easier because the libraries and supporting tools make even a complicated task easy.

   **Dynamic Memory Allocation:** When an object is created in Python, memory is dynamically allocated to it. This memory is also retracted when it is no longer being used.

   **Object-Oriented:** Python has an object-oriented approach. This means that the programs are designed using objects and classes that interact with each other.

   **Easy to understand:** The syntax or grammar of Python is simpler, hence making it easier to learn and understand. Writing programs in Python is easy as compared to other high-level programming languages.

   **Interpreted:** It is an interpreted language that executes code line by line at a time which makes debugging hassle-free.

**Integrated and Extensible language:** We can easily integrate Python with other languages such as C, C++. We can also write and compile a Python code in C or C++.

2. A set of valid characters recognised by a language is called a character set. The characters are used in Python source program belong to Unicode standard. The characters in Python are grouped into the following categories:
   - Alphabet: A to Z (uppercase), a to z (lowercase)
   - Digits: 0 to 9
   - Special characters (:) colon space ( ) + _ − * //\ ^ & % #$ {} [] ! _(underscore) >< ? @ , ; : etc. (white space, blank space, horizontal tab (→), carriage return, New line, form feed)
   Python can process any of the ASCII and Unicode characters as data or as literals.

3. An identifier is a sequence of characters taken from Python character set. It refers to variables, functions and arrays.

4. **Assignment Operators :** These operators are used to assign value to a variable.

| Operator | Name | Description | Example (x=2) |
|---|---|---|---|
| = | Assignment | It assigns the value of the operand on the right side to the left side operand. | x = 5 |
| += | Addition assignment | It adds the right operand to the left operand and assigns the result to left operand. x+=3 is equivalent to x=x+3. | x += 3 |
| −= | Subtraction assignment | It subtracts the right operand from the left operand and assigns the result to left operand. x−=3 is equivalent to x=x − 3. | x −= 3 |

| | | | |
|---|---|---|---|
| *= | Multiplication assignment | It multiplies the right operand with the left operand and assigns the result to left operand. x*=3 is equivalent to x=x*3. | x *= 3 |
| /= | Division assignment | It divides the left operand with the right operand and assigns the result to left operand. x/=3 is equivalent to x=x/3. | x /= 3 |
| %= | Remainder assignment | It takes the modulus of two operands and assigns the result to left operand. x%=3 is equivalent to x=x%3. | x %= 3 |
| //= | Floor division assignment | It performs floor division on operators and assigns the value to the left operand. x//=3 is equivalent to x=x//3. | x //= 3 |
| **= | Exponentiation assignment | It performs exponential (power) calculation on operators and assigns the value to the left operand. x**=3 is equivalent to x=x**3. | x **= 3 |

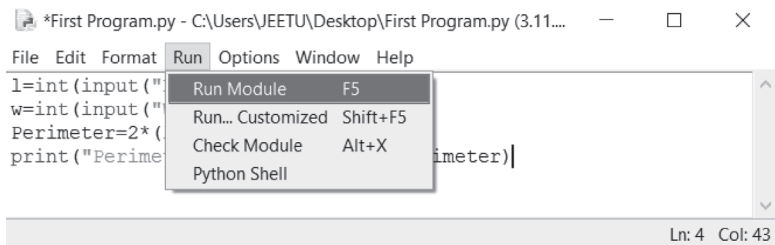**5.** Some commonly used keywords in Python are given below:

| | | | | | | |
|---|---|---|---|---|---|---|
| false | assert | del | for | in | or | while |
| none | break | elif | from | is | pass | with |

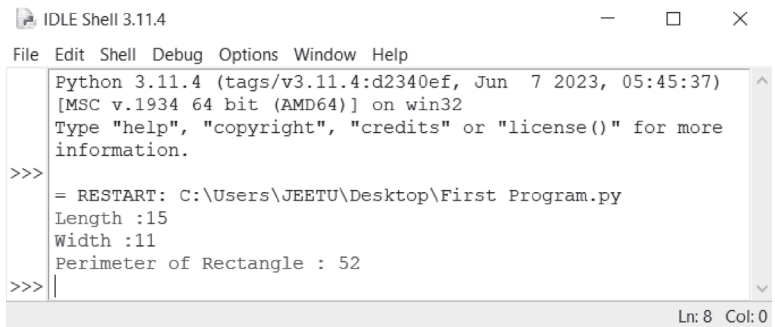| true | class | else | global | lambda | raise | yield |
|------|-------|------|--------|--------|-------|-------|
| and | continue | except | if | nonlocal | return | async |
| as | def | finally | import | not | try | await |

6. To run a Python program, follow the steps given below:
   Step 1 : Click on the Run menu.
   Step 2 : Click on the Run Module option.



The output will be displayed in the Python Shell window.



 (11)

# Artificial Intelligence (AI) and its Approaches

**A. Multiple Choice Question (MCQ)**
   **Darken the correct option in OMR Sheet :**
   **1.** (c)　　　**2.** (c)　　　**3.** (a)　　　**4.** (b)

**B. Tick (✓) for true statement and cross (✗) for false statement :**
   1. ✗      2. ✗      3. ✓      4. ✓      5. ✓

**C. Fill in the blanks using help box :**
   1. Artificial intelligence      2. Storage Artificial Intelligence
   3. Narrow AI      4. Agent function
   5. Architecture      6. Self-aware

**D. Write answers of the following :**
   1. Artificial Intelligence (AI) is the simulation of human intelligence process by machines, especially computer systems. AI imparts intelligence to the machines so that the intelligent machines can work, operate, and react just like human beings and help in decision-making based on real-time scenarios. Artificial Intelligence is a technology that uses smart software tools to provide semantic intelligence to devices and machines just like humans do. The software understands the business scenario, analyses real-time data, makes decisions, performs tasks, and gives responses accordingly.

   2. **Artificial General Intelligence (AGI) :** This is a type of artificial intelligence which can perform any task that involves intelligence like humans. The devices built on the concept of Artificial General Intelligence are intended to imitate thinking and decision-making abilities of a human mind. They focus mainly on highly intellectual tasks rather than emphasizing on the fundamental chores. Artificial General Intelligence is also known as strong artificial intelligence.

      For example, Hanson Robotics, A Hong Kong based engineering and robotics company, has developed a social robot called Sophia that has an ability to learn from its surroundings and make appropriate decisions.

   3. The task of AI is to design an agent program which implements the agent function. The structure of an intelligent agent is a combination of architecture and agent program. It can be viewed as:

      Agent = Architecture + Agent Program

      Following are the main three terms involved in the structure of an AI agent:

**Architecture:** Architecture is machinery that an AI agent executes on.

**Agent Function:** Agent function is used to map a sequence of perceptions into an action.

**Agent program:** Agent program is an implementation of agent function. An agent program executes on the physical architecture to produce function.

4. PEAS is a representation system for AI agents which caters to measuring performance with respect to Environment, Sensors, and actuators. To design an agent, we must know our task environment. PEAS system helps specify the task environment. It is made up of four words:

   P : Performance measure    E : Environment

   A : Actuators               S : Sensors

   Here performance measure is the objective for the success of an agent's behaviour.

   **PEAS for self-driving cars :** The representation of PEAS for self-driving cars will be:

   | | |
   |---|---|
   | Performance | : Safety, time, legal drive, comfort |
   | Environment | : Roads, other vehicles, road signs, pedestrian |
   | Actuators | : Steering, accelerator, brake, signal, horn |
   | Sensors | : Camera, GPS, speedometer, odometer, accelerometer, sonar. |

5. **Artificial General Intelligence (AGI) :** This is a type of artificial intelligence which can perform any task that involves intelligence like humans. The devices built on the concept of Artificial General Intelligence are intended to imitate thinking and decision-making abilities of a human mind. They focus mainly on highly intellectual tasks rather than emphasizing on the fundamental chores. Artificial General Intelligence is also known as strong artificial intelligence.

   For example, Hanson Robotics, A Hong Kong based engineering and robotics company, has developed a social robot called Sophia that has an ability to learn from its surroundings and make appropriate decisions.

**Artificial Super Intelligence (ASI) :** Super AI is a level of intelligence of systems at which machines could surpass human intelligence, and can perform any task better than human with cognitive properties. It is an outcome of general AI. Some key characteristics of strong AI include the ability to think, to reason, solve the puzzle, make judgments, plan, learn and communicate by its own.

6. **Reactive Machines :** These machines are the most basic form of AI applications. Examples of reactive machines are games like Deep Blue, IBM's chess-playing supercomputer. The AI teams do not use any training sets to feed the machines, nor do the later store data for future references. Based on the move made by the opponent, the machine decides/predicts the next move.

7. **Theory of Mind :** Theory of mind is the concept where the bots will be able to understand the human emotions, thoughts, and how they react to them. If the AI-powered machines are ever to mingle with us and move around with us, understanding human behaviour is imperative. And then, reacting to such behaviours accordingly is the requirement.

E. **Write the full form of the following :**
1. AGI     Artificial General Intelligence
2. ASI     Artificial Super Intelligence
3. ANI     Artificial Narrow Intelligence
4. PEAS   Performance Environment Actuators Sensors

# Computer-8

## 1       Networking Concepts

**A. Multiple Choice Question (MCQ)**

Darken the correct option in OMR Sheet :

**1.** (b)      **2.** (c)      **3.** (c)      **4.** (c)

**B. Tick (✓) for true statement and cross (✗) for false statement :**

**1.** ✓     **2.** ✓     **3.** ✗     **4.** ✗     **5.** ✓

**C. Fill in the blanks using help box :**

**1.** Hub      **2**. Router      **3**. Internet

**4**. Star      **5**. Coaxial Cable

**D. Write answers of the following :**

**1.** In general, Networking refers to creating networks. A network is a group of devices linked to each other. A cable network and a telephone network are examples of networks.

**Easy data sharing :** Computer networking has made it easy to share useful information instantly.

**Easy access to data :** Data stored on a local storage device may be lost if the device gets corrupted and no backup has been made.

**Cost-effectiveness :** Using a computer network allows us to share hardware devices, such as printers, modems, and scanners, which reduces the overall cost of the hardware.

**No need to keep hard copies of documents :** In a computer network, we share soft copies of documents, which has reduced the need for keeping hard copies of documents.

**2. Router :** A router is a communication device that is used to connect two different networks, such as two LANs or a LAN and a WAN. It plays a vital role in controlling the traffic and keeping the network efficient. It chooses the best route for the data packets to be transmitted at the receiver's end.

**Switch:** A switch is a device that is also used to connect computers in a network. However, a switch is a more intelligent device than a hub. Unlike a hub, the switch sends the incoming data to the desired destination only. It records the addresses of all the computers connected to it.

3. A PAN is a network of personal devices equipped to handle networking within a limited area. It handles the interconnection of IT devices within the surroundings of a single user.

   A LAN is the basic building block of any computer network. A LAN can range from two computers connected by a cable to hundreds of connected computers and peripherals in a big corporation.

4. The term 'network topology' refers to the way in which different devices are arranged physically or logically in a network. A physical topology is a physical arrangement of different nodes (connection points within a network), workstations, and cables in a network, while a logical topology defines the way in which the information flows between various components of a network.

   Major network topologies are bus, star, ring, mesh, and tree topologies.

   **Bus Topology :** In the bus topology, each computer and device of the network is connected to one main cable. This cable is known as the 'backbone'. In this type of network, one of the computers acts as a server. A server is a computer that processes the requests and delivers data to other computers.

   **Star Topology :** In a star topology, each computer and device is connected to a central server, called a hub, through a point-to-point connection. The devices in the star topology can communicate with each other only through the hub.

5. We need to secure a network against unauthorized access. In a computer network, multiple users access the same

data, and thus it becomes important to manage access to the network. For example, an unauthorized user can access the network of an organization and try to modify or steal confidential data.

Network security is ensured in many ways. Two of the most common ways are as follows:

- Each authorized user is given a unique username and password for accessing the network.
- Different users are given different types of access rights, such as read-only access, read-write access, and no access.

# 2 Introduction to Microsoft Access 2016

**A. Multiple Choice Question (MCQ)**

**Darken the correct option in OMR Sheet :**

**1.** (c)  **2.** (d)  **3.** (b)  **4.** (c)

**B. Tick (✓) for true statement and cross (✗) for false statement :**

**1.** ✓  **2.** ✓  **3.** ✗  **4.** ✓  **5.** ✗

**C. Fill in the blanks using help box :**

**1.** Tables  **2.** Title bar  **3.** field

**4.** Primary key  **5.** datasheet

**D. Write answers of the following :**

**1.** Using a DBMS we can access and modify the data in a database, query the database to view a particular set of data, print the data in a pre-defined format and perform many other useful manipulations on the data.

In simple words we can say that Database Management System allows us to manage a database. The management of a database involves creating a database and modifying, deleting and adding data in it.

**2.** (a) Tables are the building blocks of a database. They store the complete data in a structured manner, i.e., in the

form of rows and columns. Every table has a finite number of columns and rows.

(b) A database usually contains data pertaining to one particular entity or organization.

(c) A primary key is a field or combination of fields that uniquely identifies the records in a table. A primary key field cannot have repetitive values and cannot be left blank. In Table, Eno field can be made the primary key as every employee has a unique employee number.

3. The steps to create a table in the Design view are :

Step 1 : Click on the Create tab.

Step 2 : Click on the Table Design option in the Tables group. A new table is inserted in the database and it opens in the Design View. A new tab named Design appears in the Ribbon.

Step 3 : Enter the name for the field in the Field Name column.

Step 4 : Choose a Data Type for a field from the Data Type list.

Step 5 : Use the Field Properties pane to set the properties for the fields.
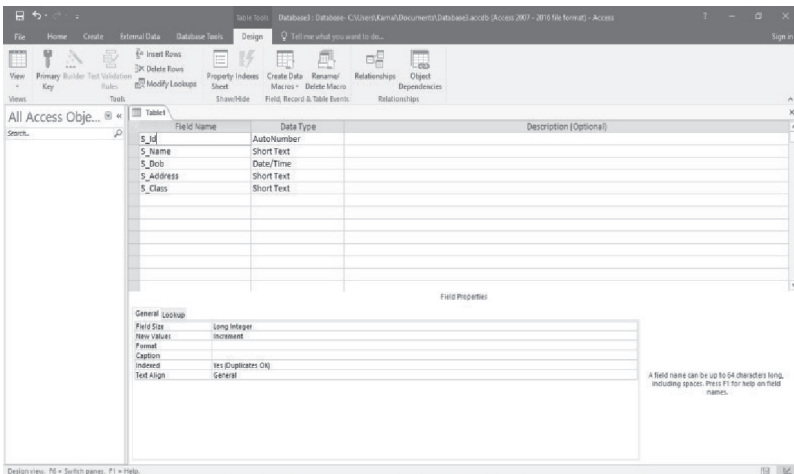


Repeat steps 3 to 5 for all the fields in the table.

Step 6 : Place the cursor on the field to be set as the Primary key and click on the Primary Key option in the Tools

group on the Design tab. You will notice that a key symbol appears next to the field.

Step 7 : Click on the Save button on the Quick Access toolbar or click on the File tab and choose the Save option. Save the table with an appropriate name.

4. Step 1 : Click on the column header that you want to move.

Step 2 : Drag the header to the left or right. Release the mouse button after choosing the correct position.
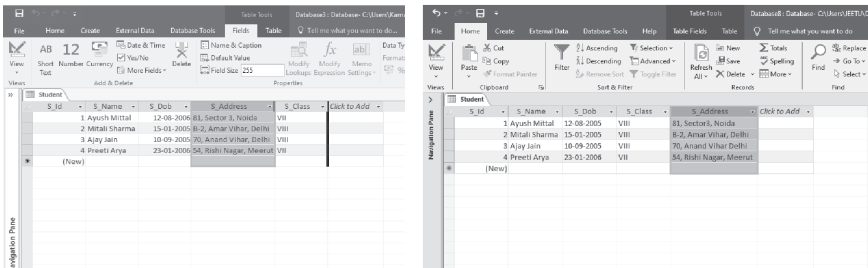


5. There are two views in a table- Design and Datasheet.

**Design View :** The Design view is used to design the structure of the database. The Design view window is divided into two parts.

- **Field Grid Pane:** Field names and their description can be defined here.
- **Field Properties Pane:** Properties for the fields can be defined here.

**Datasheet View :** Datasheet view displays a grid of rows and columns. The rows represent the records, and the columns represent the fields. The column headers are used to define the names of the fields.

 **3** | # Working with Queries, Forms and Reports

A. **Multiple Choice Question (MCQ)**
   **Darken the correct option in OMR Sheet :**

   **1.** (c)        **2.** (c)        **3.** (d)        **4.** (d)

**B. Tick (✓) for true statement and cross (✗) for false statement :**

1. ✗      2. ✓      3. ✗      4. ✗      5. ✓

**C. Fill in the blanks using help box :**

1. Queries        **2**. Reports        **3**. Relationship

**4**. create        **5**. controls

**D. Write answers of the following :**

1. A query is a method of getting answers to questions about data. The query can involve a single table or multiple tables to get the answer.

2. A form provides an interface that allows users to enter, change, and view the data in a database tables.

3. Follow these steps to create a form:
   Step 1 : Click on the table in the Navigation Pane on which the form should be based.
   Step 2 : Click on the Create tab.
   Step 3 : Click on the Form option in the Forms group. A form is created and it opens in the Layout View. You can change the view to the Form view and enter or display data in the table. Three new tabs Design, Arrange and Format appear in the Ribbon.
   Step 4 : Click on the Save option in the Quick Access Toolbar or the Save option on the File tab to save the form. You will notice that the Form object gets added to the Navigation Pane.

4. Reports are used to present data from tables or queries in a format that can be printed. Printouts of report cards, invoices are examples of reports. We cannot make changes to the data in a report.

5. **Printing a Report :** To print a report, select the File tab and then click either on the Print option or select the Print Preview View option.
   This view displays how the report will appear on a page. It also allows us to choose the Page orientation, Page setup, etc.
   • If needed, modify the page size, margin width, and page

orientation using the related commands on the Ribbon.
- Click on the Print option. The Print dialog box will appear. Set any desired print options then click OK.

# 4 More on Photoshop

A. **Multiple Choice Question (MCQ)**
   **Darken the correct option in OMR Sheet :**

   **1.** (b)　　　**2.** (c)　　　**3.** (d)　　　**4.** (d)

B. **Tick (✓) for true statement and cross (✗) for false statement :**

   **1.** ✗　　　**2.** ✗　　　**3.** ✓　　　**4.** ✓　　　**5.** ✓

C. **Fill in the blanks using help box :**

   **1.** black, white　　　**2.** pencil　　　**3.** Paint Bucket Tools
   **4.** Clone Stamp　　　**5.** background

D. **Write answers of the following :**

   **1.** The Healing Brush Tool allows you to repair imperfections such as scratches, blemishes and marks in an image. While working with this tool, you pick up sample pixels (pixels to be used for repairing) from the adjoining portion of an image. The Healing Brush Tool matches the texture, lighting, transparency and shading of the sampled pixels and applies them to the pixels that are being repaired.

   The Spot Healing Brush Tool works in a similar manner to the Healing Brush Tool except that it does not require the sampling point to be set. It automatically picks up the sampled pixels from around the area to be retouched. This tool can be used to quickly remove spots, blemishes and other marks from photographs.
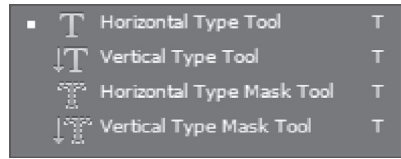
   **2.** The Pattern Stamp Tool clones from a pre-defined area of pixels such as a pattern. You have to first define a pattern and then you can clone it.

   **3.** The steps to use the Type Tool are :
   Step 1 : Open the image.

Step 2 : Select the Horizontal Type Tool or the Vertical Type Tool.

Step 3 : Set the appropriate options such as font family, size, style, alignment and text colour for the Type Tool in the Options bar.

| | | |
|---|---|---|
| ▪ T Horizontal Type Tool | T |
| ⬇T Vertical Type Tool | T |
| T Horizontal Type Mask Tool | T |
| ⬇T Vertical Type Mask Tool | T |

Step 4 : Click to set the insertion point anywhere on the image.

Step 5 : Enter the desired text.

Step 6 : Accept changes to the text by clicking the Commit button or cancel the operation by pressing the Cancel button in the Options bar.

4. Layers can be thought of as transparent sheets mounted on the top of each other.

Layers let you work on an individual part or an element of an image without affecting the other parts or elements. You can change the composition of an image by changing the order and properties of layers.

Elements placed on higher layers are displayed above the elements placed on lower layers.

# 5 Using Lists, Images and Links

A. **Multiple Choice Question (MCQ)**
   **Darken the correct option in OMR Sheet :**

   **1.** (a)  **2.** (d)  **3.** (c)  **4.** (c)

B. **Tick (✓) for true statement and cross (✗) for false statement :**

   **1.** ✗  **2.** ✗  **3.** ✗  **4.** ✓  **5.** ✓

C. **Fill in the blanks using help box :**

   **1.** Type  **2.** Numbered  **3.** 1

   **4.** <dt>  **5.** <marquee>

**D. Write answers of the following :**

1. The types of list that HTML provides are :
   - Unordered List
   - Ordered List
   - Definition List

2. An unordered list is a collection of related items that have no special order or sequence. The list can be defined within the <ul> and </ul> tags. Each item in the list is marked with a bullet. That is why unordered list is also known as Bulleted List.
   The ordered list is used to display the list of items in a specific order. The list begins and ends with <ol> and </ol> tags respectively. Each item in the list is marked with a number, that is why it is also known as the Numbered List.

3. We can use type attribute to specify the type of numbers we like. By default, its value is '1' for an ordered list. We can also use start attribute with an ordered list to specify the start value of the first item from which an ordered list should start. By default, ordered lists start at 1.

4. Specifies the text to be displayed while the file loads or if the browser does not support graphics.

5. A website consists of a number of web pages that give you access to the related information. HTML renders a powerful feature of linking these web pages together. This feature is called Hyperlinking. Using these hyperlinks, one can open any linked web page on the Internet instantly. When you hover the mouse pointer over a link, it changes into a little hand.
   **Types of Linking**
   - Internal Linking
   - External Linking

   **Internal linking:** When one part of a web page is linked to another section on the same page, it is called internal linking.
   **External linking:** When one page is linked to another web page or website, it is called external linking.

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**A. Multiple Choice Question (MCQ)**
**Darken the correct option in OMR Sheet :**

**1.** (c)      **2.** (a)      **3.** (d)      **4.** (c)

**B. Tick (✓) for true statement and cross (✗) for false statement :**

**1.** ✓      **2.** ✗      **3.** ✗      **4.** ✗      **5.** ✗

**C. Fill in the blanks using help box :**

**1**. Tables      **2**. <th>      **3**. <caption>

**4**. thicker      **5**. bgcolor

**D. Write answers of the following :**

**1.** Tables are created to:
- Present Information or data in a comprehensive manner
- Make comparative analysis of data
- Display information that is easier to read and quicker to evaluate

**2.** The basic structure of a table consists of the following tags.

   **1. <table> tag:** The <table> and </table> tags mark the beginning and the end of a table in an HTML document.

   **2. <tr> tag:** <tr> tag defines a row in the table. It is the <tr> tag that divides a table into rows.

   **3. <th> tag:** <th> tag defines a header cell in the table. The first row of the table can be divided into data cells using the <th> tag. The text enclosed within the <th> tag is aligned centrally inside the cell and is displayed in a bolder font.

   **4. <td>tag:** <td> tag defines a cell in the table. Subsequent rows after the first row in the table can be divided into data cells using the <td> tag.

**3. Cellpadding :** This attribute sets the margins within a cell. It sets the amount of space in between the cell border and the cell data. The value of this attribute is indicated in pixels.

Example: <table border="3" bordercolor ="BLUE" bgcolor="White" align= "Center" cellpadding="10">

**Cell Spacing**

This attribute is used to set the minimum distance between two adjacent cells. CellSpacing is also measured in pixels.

Example: <table border="3" bordercolor ="BLUE" bgcolor="White" align= "Center" cellspacing="10">

| | | |
|---|---|---|
| **4.** rowspan | This attribute specifies the number of rows a data cell should span. This attribute is used with the <td> tag or the <th> tag. | <td rowspan ="2"> |
| colspan | This attribute specifies the number of columns a data cell should span. This attribute is used with the <td> tag or the <th> tag. | <td colspan="2"> |

# 7  Know More About Python

A. **Multiple Choice Question (MCQ)**
   **Darken the correct option in OMR Sheet :**

   **1.** (d)   **2.** (c)   **3.** (a)   **4.** (c)   **5.** (d)   **6.** (d)

B. **Tick (✓) for true statement and cross (✗) for false statement :**

   **1.** ✓   **2.** ✗   **3.** ✓   **4.** ✗   **5.** ✓

C. **Fill in the blanks using help box :**

   **1.** Website developer **2.** parameter   **3.** slice
   **4.** commas   **5.** Python string **6.** predefined

D. **Write answers of the following :**

   **1.** Python is a multi-purpose programming language. We can use it for a variety of tasks. We can learn Python for machine learning and AI. In fact, Python is the best language for machine learning and data science projects. Python is also

popular for website development. Let us take the next step in learning the Python programming language.

2. Python function is a block of code which only runs when it is called. We can pass data, known as parameters, into a function. A function can return data as a result.

There are many advantages of the Python functions. Let's know about them.

By using the functions, we can avoid the repeating of the same code block.

Once the function has been defined, it can be called many times and from anywhere.

By using the function, program can be easily modularized.

By using the function, we can return as many outputs as we want with different arguments.

*Syntax:*

def function_name (parameters):

# body of the function

return expression

**Elements of Functions**

- The beginning of a function header starts with the keyword 'def' followed by the function name and parentheses.
- We pass arguments to the defined function using parameters.
- The function header is terminated by a colon (:).

- The body of the function is made up of several valid Python statements. The indentation depth of the whole code block must be the same.
- We can use a return expression to return a value from a defined function.

3. Python tuple is another sequence data type that is similar to the list. A tuple consists of a number of values separated by commas. Unlike lists, however tuples are enclosed within parentheses. The main differences between lists and tuples are: Lists are enclosed in brackets ([ ]) and their elements and size can be changed, while tuples are enclosed in

parentheses ( ( ) ) and cannot be updated. Tuples can be thought of as read-only list.

*Syntax:*

Tuple_name = (item 1, item 2, item 3, - - - - - - - - -)

4. **Creating a Function :** In Python, a function is created by using the 'def' keyword:

Example:

def welcome ():

print ("Welcome for using me")

5. **Defining and Calling a Functions with Parameters :** The parameter contains the types and names of the arguments that must be passed to the function.

Syntax:

def function_name(parameter: data_type):

#body of the function

return expression

**Program :**  To calculate the addition of two numbers and print the result.

first program python.py

File   Edit   Format   Run   Options   Window   Help

```
def add(num1: int, num2: int):
    #Addition of two numbers
    num3 = num1 + num2
    return num3
#Arguments value
num1, num2 = 13, 20
ans =add(num1, num2)
print (" Addition of", num1,",",num2,"=", add(num1,num2))
```

**Output of the Program**

IDLE Shell 3.11.4                                                    —   □   ×

File   Edit   Shell   Debug   Options   Window   Help

```
Python 3.11.4 (tags/v3.11.4:d2340ef, Jun  7 2023, 05:45:37) [MSC v.
1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more informa
tion.
>>>
= RESTART: C:\Users\JEETU\Desktop\first program python.py
 Addition of 13 , 20 = 33
```

6. Python string is the collection of the characters enclosed within quotes. Strings in python are surrounded by either single quotation marks or double quotation marks.

'Hello' is the same as "Hello".

Subsets of the strings can be taken using the square brackets ([ ] and [:]) with indexes starting at **0** in the beginning of the string and working their way from − 1 at the end. The plus (+) sign is the string concatenation operator and the asterisk (*) is the repetition operator.

Syntax:

Strng_name = "collection of characters"

Example:

str = 'Welcome to use Python!'

```
print(str)          # Prints complete string
print(str[0])       # Prints first character of the string
```

# 8 E-Governance and E-Commerce

## A. Multiple Choice Question (MCQ)
**Darken the correct option in OMR Sheet :**

**1.** (d)    **2.** (c)    **3.** (c)    **4.** (d)    **5.** (c)    **6.** (d)

## B. Tick (✓) for true statement and cross (✗) for false statement :

**1.** ✗    **2.** ✓    **3.** ✓    **4.** ✗    **5.** ✓

## C. Fill in the blanks using help box :

**1**. digilocker    **2**. G2G    **3**. E-Commerce

**4**. Producers    **5**. Consumer-to-Consumer

**6**. Security

## D. Write answers of the following :

**1.** E-governance, expands to electronic governance, is the integration of Information and Communication Technology (ICT) in all the processes, with the aim of enhancing government ability to address the needs of the general public.

**2.** E-government functions can be classified into four main categories.

1. **G2G (Government to Government):** When the exchange of information and services is within the periphery of the government, is termed as G2G interaction.
2. **G2C (Government to Citizen) :** The interaction amidst the government and general public is G2C interaction.
3. **G2B (Government to Business):** In this case, the e-governance helps the business class to interact with the government seamlessly.
4. **G2E (Government to Employees):** The government of any country is the biggest employer and so it also deals with employees on a regular basis, as other employers do.

3. Commerce refers to the exchange of goods and services, usually for money. There are three parties to any such exchange: buyers, sellers, and producers.

   **Buyers** are the people with money who want to purchase goods or services.

   **Sellers** are the people who offer goods and services to buyers. Sellers are of two types retailers who sell directly to consumers and wholesalers or distributors who sell to retailers and other businesses.

   **Producers** are the people who create the products and services that sellers offer to buyers. A producer is always, by necessity, a seller as well. He may sell the products to wholesalers, retailers, or directly to the consumer.

4. **Types of E-Commerce :** There are four kinds of e-commerce models at present. These models are as follows:

   **Business-to-Business :** This model involves transactions taking place between companies.

   **Business-to-Consumer :** This model refers to transactions between a company and a customer.

   **Consumer-to-Consumer :** This model refers to e-commerce between consumers or individuals.

   **Digital Middlemen :** This model refers to the e-commerce model that provides information about products from many other companies.

5. **Advantages of E-Commerce**
   - E-commerce provides the sellers with a global reach. Now sellers and buyers can meet in the virtual world, without the hindrance of location.
   - Electronic commerce will substantially lower the transaction cost. This allows the companies to enjoy a much higher margin of profit.

# 9 Artificial Intelligence and its Impact

A. **Multiple Choice Question (MCQ)**
   **Darken the correct option in OMR Sheet :**
   **1.** (a)    **2.** (c)    **3.** (c)    **4.** (b)    **5.** (d)    **6.** (c)

B. **Tick (✓) for true statement and cross (✗) for false statement :**
   **1.** ✗    **2.** ✓    **3.** ✗    **4.** ✓    **5.** ✗    **6.** ✗

C. **Fill in the blanks using help box :**
   **1**. learning, reasoning, Self-correction    **2**. machine
   **3**. AGI                                       **4**. Deep Blue
   **5**. preparing data
   **6**. speech recognition

D. **Write the full form of :**
   **1.** NLP    :    National Language Processing
   **2.** NLU    :    National Language Understanding
   **3.** NLG    :    National Language Generation

D. **Write answers of the following :**
   **1.** Artificial Intelligence is an intelligence perceiving, synthesizing, and inferring information demonstrated by machines, as opposed to intelligence displayed by humans. AI human-machine interactions refer to the contact between humans and machines to fulfil a specific task or operation. In human-machine interactions, hardware and software play a vital role in communication. The machine itself is considered as hardware and the interface should be

user friendly. It will be built upon tangible and attentive user interface principles. Data can be accessed through software and stored on storage devices.

2. As we know artificial intelligence is all about making the machines do some complex tasks, which just don't include mechanical activities, but those tasks too which require human intelligence. There are three major domains of artificial intelligence in which machines are being made artificially intelligent.

   1. Data (Data Science)
   2. Computer Vision (CV)
   3. Natural Language Processing (NLP).

3. The difference between HI and AI are follows:

   - Human intelligence is natural, while artificial intelligence is 'artificial', i.e., man-made.
   - Human intelligence is capable of performing different tasks, i.e., humans can take decision anytime in any situation but AI can only perform for which they are designed and programmed by humans.
   - Humans take decision on the base of their own knowledge and understandings whereas artificial intelligence uses data and models which copies human command while making a decision.
   - Humans have emotions and feelings while AI doesn't have.

4. (a) Computer vision is a field of artificial intelligence that enables computers and systems to derive meaningful information for digital images, videos and other visual inputs and to take actions or make recommendations based on it. Computer vision helps computers identify, process and interpret visual data. It uses the pattern identification to interpret the content of an image; also identifies the tables, graphs and images, PDF documents along with text and videos. Some applications of computer vision have already been used in industries

like healthcare, research and development, surveillance and smart cars.

(b) It is the most basic variety of AI. It cannot make decisions based on the past scenarios or experiences. As the name suggests, reactive machines are purely reactive; they replicate a human's ability to react to different kinds of stimuli. They lack the ability to use previously-acquired information to take better decisions.

IBM's chess-playing computer, Deep Blue is an example of reactive machine which is famous for defeating World Chess Champion, Gary Kasparov. It could identify different pieces of chessboard and all the possible legal moves for itself and the opponent. Based on the move of the opponent, it could select its best-possible move. However, it did not have ability to learn from its previous moves.

(c) In psychology "Theory of Mind" that people have thoughts, feelings and emotions that affect their behavious. Future AI system must learn to understand that everyone (both people and AI objects) have thoughts and feelings. Future AI systems must know how to adjust their behaviour to be able to walk among us. As the name suggests basically it is the type of AI, which can understand or learn the human emotions and their beliefs. As of now, researchers are still in the process of developing 'Theory of Mind' machines.

(d) These types of AI are slightly advanced in the comparison of the first one. In addition to all the characteristics of reactive machines, they have memory capabilities and can use past scenarios and experiences to take better future decisions. Machines, which fall under this category, can be trained by using data and information. Most of the common applications of AI which we see around us are based on limited memory technology.

Self-driving vehicles, virtual assistants and chatbots are some of the examples of limited memory technology.

5. **Natural Language Processing (NLP):** Natural Language Processing (NLP) is a field of AI that combines computer science, linguistics, and machine learning to study how computers and humans communicate in natural language. The goal of NLP is for computers to make them able to interpret and generate human language. It not only improves the efficiency of work done by humans but also helps in interacting with the machine. NLP bridges the gap of interaction between humans and electronic devices.

Natural language processing field is divided into three parts:

**Speech Recognition:** It is used for translation of spoken language into Artificial language text.

**Natural language Understanding (NLU):** It is used for spoken or written language to provide a link between natural language inputs and what they present. It analysis different aspects of language.

**Natural Language Generation (NLG):** It helps to produce meaningful phrases and sentences along with Text planning, sentence planning, and Text realization.

# NOTES

**NOTES**