

LESSON-1

NUMBER SYSTEM

Answer the following questions:

1. What is a number system? Name the different types of number system used.

- A numbers system is the system of naming or representing numbers.
- A number system is a set of values used to represent different quantities.
- The different types of number system are-
 1. Decimal number system
 2. Binary number system
 3. Octal number system
 4. Hexadecimal number system

2. What are the rules to convert a decimal number into a binary number?

Rules to convert decimal number into binary number are:

Step 1: Divide the given decimal number with the base 2.

Step 2: Write down the remainder and divide the quotient again by 2.

Step 3: Repeat the step 2 till the quotient is zero.

Remainder, which are obtained in each steps are written in reverse order to form binary equivalent.

3. Write the rules to multiply two binary numbers.

- The rules for performing multiplication using binary numbers is same as that of the decimal numbers.
- It can be illustrated by the following table-

A	B	A*B=C
0	0	0*0=0
0	1	0*1=0
1	0	1*0=0
1	1	1*1=1

4. Briefly explain the octal number system.

- The octal number system consists of 8 digits: 0 to 7 with the base 8.
- The concept of Octal number system came from the Native Americans as they used to count numbers by using the space between their fingers rather than by using their fingers.
- The base value of octal number system is 8.
- Example- $(317)_8$, $(451)_8$ etc.

5. What do you understand by hexadecimal number system?

- Hexadecimal number system consists of 16 digits: 0-9 and the letters A-F, where A-F represents digits 10 to 15 with the base 16.

Hex	Decimal value
10	A
11	B
12	C
13	D
14	E
15	F

- This number system is also known as Hex, where Hex = 6 and Decimal = 10, so it is called hexadecimal number system.
- The base value of hexadecimal number system is number system is 16.
- Example- $(3B)_{16}$, $(4D3)_{16}$ etc.

6. Write down the rules for binary addition.



Extra

LESSON-2

ADVANCED FEATURES OF EXCEL

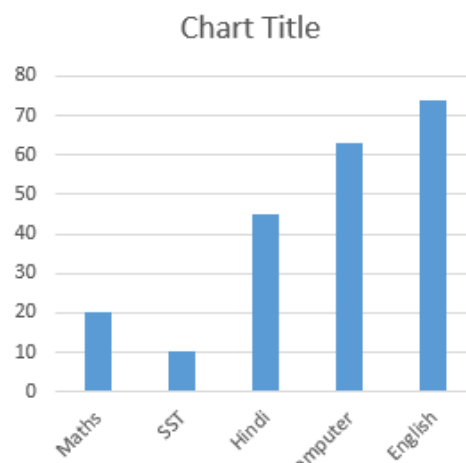
Answer the following questions:

1. What is a chart?

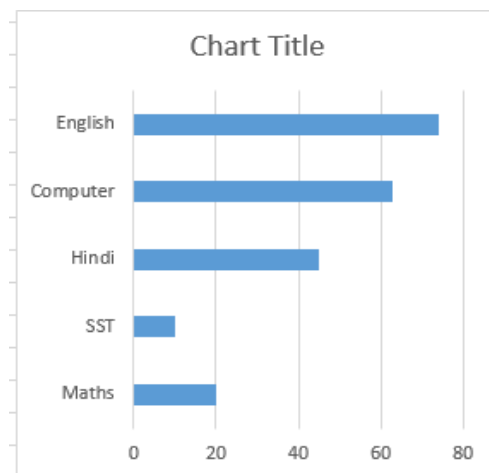
- Chart is an effective way to display data in a pictorial form.
- Charts make it easier to draw comparison and analyze the growth, relationship and trends among the values in a range.
- It provides more accurate analysis of information.
- When we insert a chart, the data displayed in a special window called Datasheet.
- Commonly used chart types are- Bar chart, Column chart, Line chart etc.

2. How is a column chart different from a bar chart?

- A column chart displays the data in the form of vertical bars.
- A column chart is used to show changes in data over a period of time.
- A column chart is easy to compare different things among different items of data.

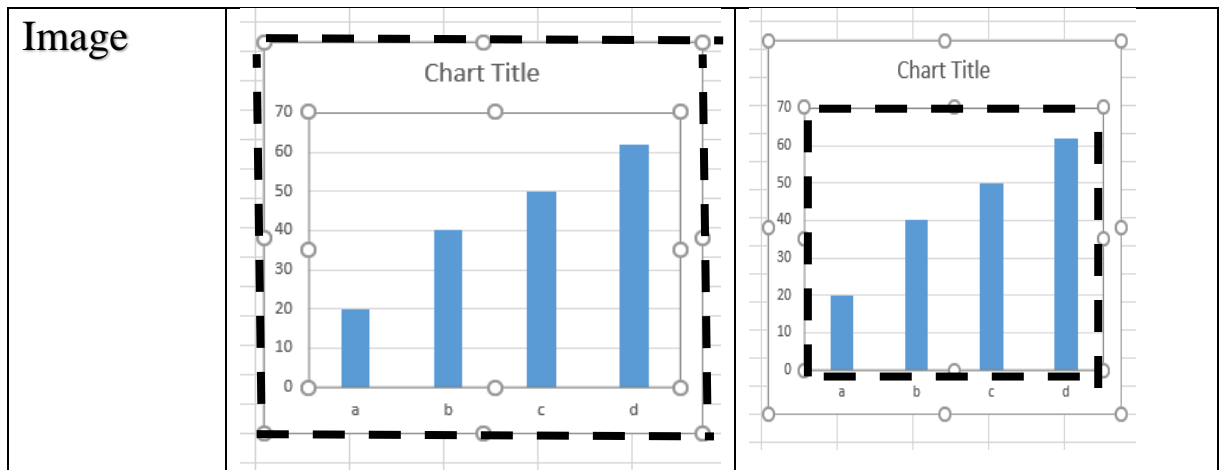


- A bar chart helps to display the data in the form of horizontal bars.
- A bar chart displays comparison amongst the individual items.
- A bar chart are good for displaying a large number of data sets on the category axis.



3. What is the difference between chart area and plot area?

Basis	Chart area	Plot area
Definition	Contains the entire chart, including all elements.	Contains the graphical representation of the data.
Include	Chart area includes plot area.	Plot area does not include chart areas.
Space	Chart area covers large space.	Plot area covers less space.
Formatting impacts	Changes affect the entire chart.	Changes affect only the area where data is plotted.



4. What is data consolidation?

- Data Consolidation helps in combining the data of multiple worksheets.
- It is a technique that summarizes the data from different worksheets and combine it into single worksheet.
- This feature also allow to perform operation like sum, min, max, product, etc. on the data to be consolidated.
- Example- Data consolidation can be used by financial analysts to combine department wise budget.

Sheet 1

Month	Sales
Jan	100
Feb	350

Sheet 2

Month	Sales
Jan	200
Feb	150

Consolidated sheet

Month	Sales
Jan	300
Feb	500

5. Write any 3 difference between sorting and filtering?



LESSON-3

MORE ON GIMP

Answer the following questions:

1. Explain in brief the utility of layers.

- Layers are the transparent sheets that can hold objects and are stacked on the top of each other.
- When you have a number of objects, it is always better to distribute the objects in different layers as it makes the work process much easier.
- We can draw and edit the objects on one layer without affecting the objects on another layer.
- We can add a number of layers, make them visible or invisible, change their position etc.

2. Explain any one Paint tool in GIMP.

- GIMP provides with many tools for quick and easy image transformation, and helps to make the image look attractive.
- The Paintbrush tool is its very useful tool; it is used to create smooth strokes of the foreground colour in your image.
- It can also be used to paint on images, selections, or layers.

3. How can you rotate an image in GIMP?

To Rotate an image in GIMP:

- Open any image and select the Rotate Tool from the Toolbox.
- Click on the image. The Rotate dialog box appears.
- Set the rotation angle and coordinates (x, y) for the rotation axis.
- Click on the Rotate button and observe the change.

4. Briefly explain the process of adjusting brightness of an image.

To change the brightness of the image follow these steps-

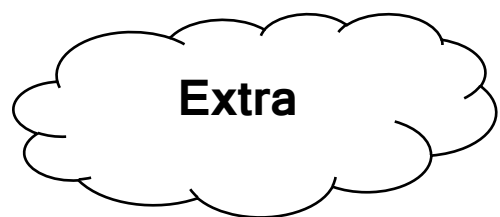
- Select the Colors > Brightness option.
- The Brightness-Contrast dialog box appears.
- You can change the settings either by increasing or decreasing the slider buttons in the dialog box.

5. How can you take screenshot in GIMP?

To take Screenshot in GIMP:

- Open any image.
- Click on File > Create > Screenshot.
- The Screenshot dialog box appears.
- You can either select the Take a screenshot of a single window or Take a screenshot of the entire screen option button.
- The Delay feature allows you to issue the command to take a screenshot after an interval that you specify.
- Click on the Snap button. The screenshot of the image appears on the screen.

6. Write about flip tool.



LESSON-4

INTRODUCTION TO HTML5

Answer the following questions:

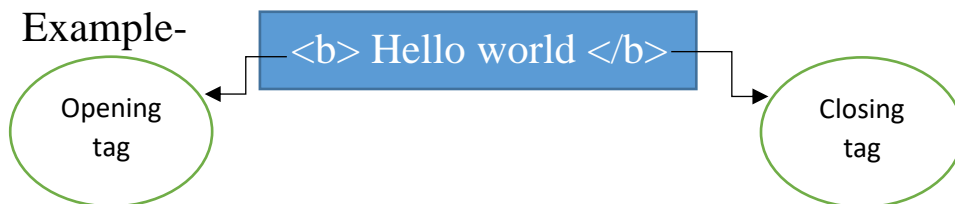
1. What is HTML?

- HTML stands for Hypertext Markup language.
- It is a standard markup language that allows the user to create web pages that contains both text and graphics.
- HTML describes the structure and behaviour of the web document.
- HTML is easy to learn and easy to use.

2. Explain the terms tags and attributes.

Tags

- Tags are the building blocks of a web page.
- They contain elements which define how the information on a web page is formatted or displayed.
- Tags are written in angular brackets. <> like <html>,<title>,<p>,<body> etc.
- Example-



Attributes

- An attribute is a property that provides an additional information about an HTML document.
- An attributes are always specified in the start tags.
- It usually come in name/value pairs.
- Example-
, Where src is an attribute

3. What is an element? Explain its various types.

- An HTML element consists of an ON tag, the content and an OFF tag.
- An element is categorised into following categories:
- Container elements- Contain both ON and OFF tag.
- Empty elements- Contain only ON tags.

Start tag	Element content	End tag
<h1>	My heading	</h1>
<p>	My paragraph	</p>
 	--	--

4. What are the basic tools used to work with HTML documents? Give an example of each.

We require two basic tools to work with HTML documents:

- HTML Editor: It is used for creating and saving the documents.

Eg: WYSIWYG Editor

- Browser: It is used for viewing the documents.

Eg: Google Chrome

5. What are Cascading Style Sheets? Name the different methods available for applying styles rules.

- CSS is a style sheet that provides the set of style rules for defining the layout of HTML documents.
- Using CSS, you can control the colour of the text, the style of fonts, the spacing between, size and layout of columns, background images as well as a variety of other effects.
- Style sheets describe how HTML elements should be displayed.

- There are 3 methods for applying Style rules to HTML document:
 - In-Line style sheet
 - Internal or Embedded style sheet
 - External style sheet

LESSON-5

INTRODUCTION TO ROBOTICS

Answer the following questions:

1. Classify the three types of robots.

Simple Level Robots:

- These robots are simple and cannot carry out heavy or complex tasks.
- They are basically, just able to support humans in their daily tasks.
- For example-washing machines.

Middle Level Robots:

- These robots once programmed cannot be reprogrammed and have sensor-based circuits, which can perform multiple tasks.
- For example-fully automatic washing machines.

Complex Level Robots:

- These robots can be programmed and reprogrammed easily. They have complex model-based circuits.
- For example, laptops or computers

2. Give a difference between a fixed and mobile robot.

Aspects	Fixed Robot	Mobile robot
Definition	Fixed Robots are designed to perform their task within a specific area.	Mobile Robots move around and perform tasks in large, uncertain environments
Flexibility	Less flexible	Highly flexible

Task	Specific repetitive task	Unpredictable task
Control	Controlled through predefined programs	Controlled through GPS, camera etc.
Example	Robotic arms in car manufacturing plants	Self-driving cars, vacuum cleaners, and drones

3. What are service robots?

- Service robots have improved sensors and interact with humans closely.
- They are used to assist humans in tasks, like cleaning (vacuum cleaners), transportation (self-driving cars), defence applications (drones), and medical procedures (surgery), etc.

4. Name two of India's famous robots and write their speciality.

- HDFC bank has a humanoid robot assistant named IRA 2.0, to answer the frequently asked questions by customers.
- Manav is India's first 3D-printed humanoid robot, it can perform push-ups and play football.

5. What are artificially intelligence robots? Give an example.

- The robots that show intelligent behaviour after getting programmed are called Artificially Intelligent Robots.
- We can expect the Artificially Intelligent Robots to start behaving like humans.
- For example: We can design a simple robot and program it to pick up an object and place it at another location, with the help of an AI algorithm and a camera, we can make the robot visualise the object, recognise what it is, and determine where it should be placed.

