**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
5. 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.

1. 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 |

1. 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.

1. 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.

**Extra Question**

1. Write down the rules for binary addition.

**Lesson-2**

**aDVANCED FEATURES OF eXCEL**

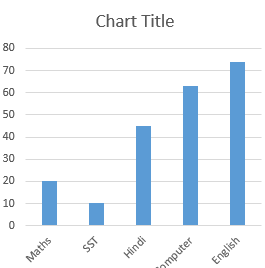
**Answer the following questions:**

1. What is a chart?

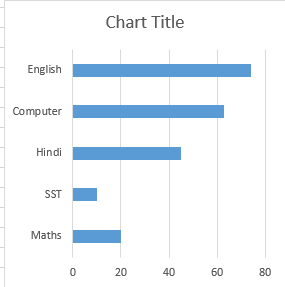
* Chart is an effective way to display data in a pictorial form.
* Charts make it easier to draw comparison and analyze the growth, relationship and trends among the values in a range.
* It provides more accurate analysis of information.
* When we insert a char, the data displayed in a special window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

1. 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.



1. 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 includes 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. |
| Image |  |  |

1. 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 Sheet 2 Consolidated sheet

|  |  |
| --- | --- |
| Month | Sales |
| Jan | 300 |
| Feb | 500 |

|  |  |
| --- | --- |
| Month | Sales |
| Jan | 100 |
| Feb | 350 |

|  |  |
| --- | --- |
| Month | Sales |
| Jan | 200 |
| Feb | 150 |

1. Write any 3 difference between sorting and filtering?

**Extra Question**

**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.

1. 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.

1. 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.

1. 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.

1. 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.

**Extra Question**

1. 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.

1. 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-

<b> Hello world </b>

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-

<img src=”google.jpg”>, Where src is an attribute

1. 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> |
| <br> | -- | -- |

1. 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

1. 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

1. 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 |

1. 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.

1. 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.

1. 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.

