1. Number System

Check Your Learning

1. 2 2. 8 3. 16 4. 10

EXERCISES

A. Fill in the blanks with the help of words given in the box.

1. 2 2. Decimal number 3. 8 4. 10 5. Binary

B. Write 'T' for true and 'F' for false statements.

1. F 2. F 3. F 4. T 5. F

C. Tick (') the correct option.

1. b 2. a 3. c 4. b 5. b

D. Answer the following questions.

1. A number system is a set of values used to represent different quantities. There are four types of number systems:
   a. Decimal Number System: Decimal Number System consists of 10 symbols from 0 to 9. These 10 digits can be used to form any number. It has a base value 10.
   Example: $(915)_{10}$, $(-53)_{10}$
   b. Binary Number System: Binary Number System consists of 2 symbols i.e. 0 and 1. Therefore, it has a base value 2. All the digital computers use binary number system and converts the decimal number format to binary equivalent.
   Example: $(10011)_2$, $(10001111)_2$
   c. Octal Number System: Octal Number System consists of 8 symbols from 0 to 7. Therefore, it has a base value 8.
   Example: $(426)_8$, $(312)_8$
   d. Hexadecimal Number System: Hexadecimal Number System consists of 16 symbols from 0 to 9 and the letters A to F. A – F represents numbers 10 to 15. It has a base value 16.
   Example: $(4C)_{16}$, $(3B4)_{16}$
2. To convert decimal number to binary, you need to follow the given rules:
   a. Divide the given decimal number with the base 2.
   b. Write down the remainder and divide the quotient again by 2.
   c. Repeat the step 2 till the quotient is zero.
   Example: Suppose we want to convert $(13)_{10}$ to binary number.

2	13	
2	6	1
2	3	0
2	1	1
	0	1

3. The rules to subtract two binary numbers are given below:

A	B	A – B
0	0	0 – 0 = 0
0	1	0 – 1 = 1
1	0	1 – 0 = 1
1	1	1 – 1 = 0

4. The Octal Number System consists of 8 symbols from 0 to 7. The concept of Octal Number System came from the Native Americans as they used to

count numbers by using the space between the fingers instead of using their fingers. It has a base value 8. You can convert octal numbers to any other number system by following the rules properly.

5. Hexadecimal Number System consists of 16 symbols from 0 to 9 and A to F. Here, A = 10, B = 11, C = 12, D = 13, E = 14 and F = 15. It has a base value 16 because hex = 6 and Decimal = 10 and combining them makes the hexadecimal = 16. Like any other number system, you can also convert hexadecimal numbers to any other number system by following the rules.
6. Decimal Number System consists of 10 symbols from 0 to 9. It has a base value 10. Each number can be used separately or you can group the numbers to form a numeric value. The value of each digit in a number depends upon the following:
   a. The face value of the digit
   b. The base of the number system
   c. The place of the digit in the number

E. Application-based questions.

1. To convert Octal Number to Decimal, she needs to use the given rules,
   a. Multiply each octal digit with its place number, with increasing power of 8 starting from extreme right digit.
   b. Increasing the power one by one, keeping the base value fixed as 8.
   c. Sum up all products to get the decimal number.
2. When we subtract 1 from 0 in binary numbers, we need to borrow 1, so (0 – 1 = 1).

Fun Zone

Game Activity

Do it yourself

Lab Session

Do it yourself

Higher Order Thinking Skills

A. a.

2	76	
2	38	0
2	19	0
2	9	1
2	4	1
2	2	0
2	1	0
	0	1

$(1001100)_2$

b. $(1001)_2=(?)_{10}$

$= (1 * 2^3) + (0 * 2^2) + (0 * 2^1) + (1 * 2^0)$

$= 8 + 0 + 0 + 1$

$= 9$

$(1001)_2 = (9)_{10}$

c. $(32A)_{16}=(?)_2$

(i) Convert Hexadecimal to decimal number system

$= (3 * 16^2) + (2 * 16^1) + (A * 16^0)$

$= 768 + 32 + (10 * 1)$

$= (810)_{10}$

(ii)

2	810	
2	405	0
2	202	1
2	101	0
2	50	1
2	25	0
2	12	1
2	6	0
2	3	0
2	1	1
	0	1

$(810)_{10} = (1100101010)_2$

Therefore, $(32A)_{16} = (1100101010)_2$

B. a. $10101 + 00111$

$$\begin{array}{r} {\scriptstyle 1\ \ 1\ \ 1} \\ 1\ 0\ 1\ 0\ 1 \\ +\ 0\ 0\ 1\ 1\ 1 \\ \hline 1\ 1\ 1\ 0\ 0 \end{array}$$

b. $10011 - 01010$

$$\begin{array}{r} 1\ 0\ 0\ 1\ 1 \\ -\ 0\ 1\ 0\ 1\ 0 \\ \hline 1\ 0\ 0\ 1 \end{array}$$

c. 101×011

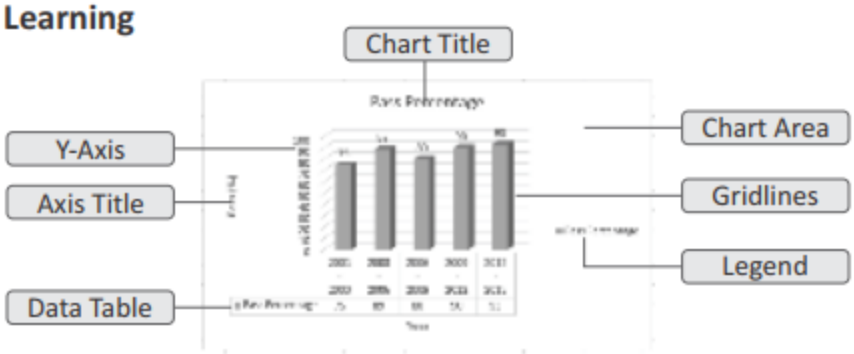
$$\begin{array}{r} 1\ 0\ 1 \\ \times\ 0\ 1\ 1 \\ \hline 1\ 0\ 1 \\ 1\ 0\ 1\times \\ 0\ 0\ 0\times\times \\ \hline 1\ 1\ 1\ 1 \end{array}$$

Project Work

Do it yourself

2. Charts in MS Excel 2016

Check Your Learning



EXERCISES

A. Fill in the blanks with the help of words given in the box.

1. Legend 2. Bar 3. Pie 4. X-axis 5. Ribbon

B. Write 'T' for true and 'F' for false statements.

1. T 2. T 3. F 4. T 5. F

C. Tick (') the correct option.

1. b 2. c 3. b 4. a 5. b

D. Explain the difference between the following terms.

1. X-axis is the horizontal axis, also known as Category axis which represents the categories on the plot area. Y-axis is the vertical axis, also known as Value axis which represents the value of the categories using which a chart is created.
2. Chart title is a title given to a chart and axis title is the title of x-axis and y-axis.
3. A 2D or 2 Dimension chart has only two dimensions say length and height, but 3D or 3 Dimension chart has three dimensions say length, height and width.
4. A plot area contains only the graphical representation of chart. But chart area includes the plot area and other elements of chart.
5. A column chart uses bars that run vertical to plot a chart but line chart uses lines to plot a chart of data series.
6. Bar chart uses bars that run horizontal to plot a chart but pie chart displays the values of a series as proportional slices of pie. Bar chart can be drawn using multiple data series but pie chart is drawn using one series of data.

7. Area chart is used to plot a chart in which the area below the plot line is solid. It is not in the case of X Y Scatter chart. The other difference is that the X-axis in X Y scatter chart can display numeric or non-numeric factors whereas in area chart the x-axis only displays texts.
8. Format tab can be used to format a chart by changing the styles, adding colors, inserting shapes and changing size, whereas the Layout tab can be used to change the chart layout by adding or modifying chart labels.

E. Answer the following questions.

1. A chart is used to represent the data graphically. It uses symbols to represent the data like bars in Bar chart, lines in Line chart or slices in Pie chart. A 2D or 2-Dimensional chart has two axis – X-axis and Y-axis which represents two variables, on the basis of which a 2D chart is created. A 3D or 3-Dimensional chart has three axis – X-axis, Y-axis and Z-axis, which represents three variables on the basis of which a 3D chart is created. Charts are useful to not only make the worksheets visually more appealing but also help the viewer to sort out and understand the information presenting to them.
2. The various types of charts are:
   a. Column Chart: A column chart uses bars that runs vertical to plot the data series. It is used to show the data changes over a period of time or show the comparisons among items.
   b. Bar Chart: A Bar chart uses bars that runs horizontally to plot the data series. It is also used to show the comparisons among individual items through a group of bars.
   c. Line Chart: A Line chart uses lines to display trends. The vertical axis always displays numeric values and horizontal axis displays time or other category.
   d. Area Chart: Area chart is same as line chart, except that the area below the plot line is solid. It is used to show trends over time.
   e. Pie Chart: A Pie chart can only display one series of the data which is displayed as proportional slices of a pie.
3. A Pie chart is used to plot a chart as proportional slices of a pie. It can display only one series of data. It represents the data in circular form. A circle is partitioned into different sections that represents a percentage for a particular partition. To create a pie chart,
   a. Create a data series in an Excel sheet.
   b. Select the data series along with field name.
   c. Go to Insert tab.
   d. From Charts group, click on the Pie chart.
   e. Select 2 D Pie chart.
   f. A 2D pie chart will be created according to the selected series.
4. To modify the labels and titles of a chart,
   a. Select the chart.
   b. Click on Layout tab in ribbon.
   c. From Labels group, click on Chart Title or Data Labels option.
   d. From the drop-down menu, select the appropriate option.
   e. Change the chart title or data label and press Enter key.
5. To change the data in a chart,
   a. Select the chart.
   b. Click on Design tab in ribbon.
   c. From Data group, click on Select Data option.

d. A Select Data Source dialog box appears.
e. Make the desired modifications and click OK button.

F. Application-based questions.

1. He can create a column chart to compare the profit and expenses of his firm. For this, he needs to create a table in Excel sheet. Then select the table and go to Insert tab> Charts group> Column Chart. A chart will be drawn accordingly. He can view the chart to view the comparison.
2. To plot a column chart, Ishan can follow the given steps:
   a. Create a data series in Excel sheet.
   b. Select the data series along with field names.
   c. Go to Insert tab , Chart group , Column Chart option.
   d. Select the type of Column chart. It will be drawn on the Excel sheet.

Fun Zone

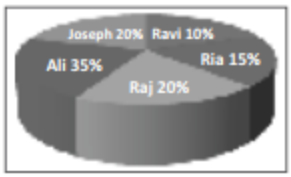
Game Activity

Do it yourself

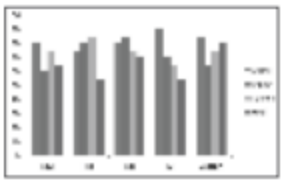
Lab Session

Do it yourself

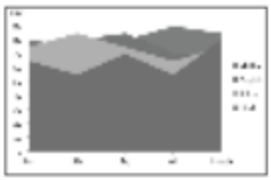
Higher Order Thinking Skills



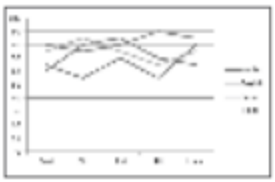
(a) Pie Chart



(b) Column Chart



(c) Area Chart



(d) Line Chart

Project Work

Do it yourself

3. Creating Animation in Animate 2022

Check Your Learning

- Movie Clip: It is a special type of symbol which has its own multi-frame timeline. Users can run animations regardless of how many actual frames the instance occupies.
- Buttons: It is a special type of four-frame interactive movie clip in Animate which is used to perform some mouse related activities like click, rollover etc.
- Graphic Symbol: It is a static symbol which is used when there is no need to add interactive functionality in an animation.

EXERCISES

A. Fill in the blanks with the help of words given in the box.

1. Instance 2. Motion 3. Classic 4. Animation 5. Movie clip

B. Write 'T' for true and 'F' for false statements.

1. T 2. F 3. F 4. T 5. T

C. Tick (') the correct option.

1. a 2. a 3. b 4. c 5. b

D. Answer the following questions.

1. Animation is the method of photographing successive drawings to create an illusion of movement in sequence. The images are created with little modifications to appear as moving images.

Three methods used to create animation are:

a. Motion Tween: In Motion tween, a path is created and an object moves along with the path.
b. Shape Tween: In Shape tween, the animation is done on an object which changes its shape as it moves from starting point to ending point.
c. Classic Tween: Classic tween is the traditional method of animation. It works like Motion tween, but with less flexibility.

2. A frame is just an intermediary between keyframes. During a normal frame, there is no modifications in the amount of an object on stage. The actual changes appear in keyframes. The total number of frames in a timeline can be used to specify the total length of the movie.

   A keyframe is a frame where a new symbol instance appears in the timeline.

   In order to make any changes in an animation, a keyframe is inserted and changes are made.
3. Timeline is used to organize and control the contents of the document over time in layers and frames.

   Timeline helps in controlling when a particular image or video will be displayed and when a particular character will enter or exit the scene in animation. You can also determine the stacking order of a scene in relation to other elements on the screen.
4. A **layer** is like a translucent sheet where you can organize your artwork. It can be used to draw and edit objects on one layer without affecting objects on another layer. These layers are stacked on the top of one another, each containing a different image that appears on the stage. Together all the layers are combined for a complete graphic or animation.

   A frame is just an intermediary between keyframes. During a normal frame, there is no modifications in the amount of an object on stage. The actual changes appear in keyframes. The total number of frames in a timeline can be used to specify the total length of the movie.
5. Motion Presets are pre-defined and saved motion tween animations which can be applied to objects on a stage. These presents are found in Motion Presets panel. You can also create and save your own custom presets.
6. A Symbol is a static object which, once created in Animate, can be reused throughout the document or in other documents as well. It can be ready-made or imported from other files or the artwork created by the user. When user converts an object or drawing into a symbol, it moves to the library automatically.

   Three types of symbols are used in Animate, they are:

   - Movie Clip: It is a special type of symbol which has its own multi-frame timeline. Users can run animations regardless of how many actual frames the instance occupies.
   - Buttons: It is a special type of four-frame interactive movie clip in Animate which is used to perform some mouse related activities like click, rollover etc.

- Graphic Symbols: It is a static symbol which is used when there is no need to add interactive functionality in an animation.

7. A symbol is a reusable object and an instance is an occurrence of the symbol on the stage. When you use the symbols outside the library, either on stage or nested inside another symbol, you are actually using the instance of the symbol.

   The advantage of using instance in animation is that if you repeatedly use instance in your animation, it does not increase the file size and keep your document file size small.

E. Application-based questions.

1. Tony can use Adobe Animate to learn animation.
2. To create a symbol of an object,
   a. Select an object.
   b. Click on **Modify** tab.
   c. Click on **Convert to Symbol** option.
   d. A **Convert to Symbol** dialog box appears. Specify the name of symbol in **Name** textbox.
   e. Specify the type of symbol using **Type** drop-down list.
   f. Click on **Registration** grid to position the registration point for the symbol.
   g. Click **OK** button.
3. Steps to create an Instance of a symbol are:
   a. Click on **Library** Panel.
   a. Click and drag the instance from Library to Stage.

   An instance of the symbol will be created on stage.

Fun Zone

Game Activity

Lab Session
Do it yourself

Higher Order Thinking Skills
Do it yourself

Project Work
Do it yourself

4. Introduction to HTML

Check Your Learning

1. Text
2. <comment> Text Note </comment>
3.
4. <hn> Heading text </hn> where, n can be 1 to 6

EXERCISES

A. Fill in the blanks with the help of words given in the box.

1. network 2. two 3. six 4. Container 5. Cascading

B. Write 'T' for true and 'F' for false statements.

1. T 2. F 3. F 4. T 5. F