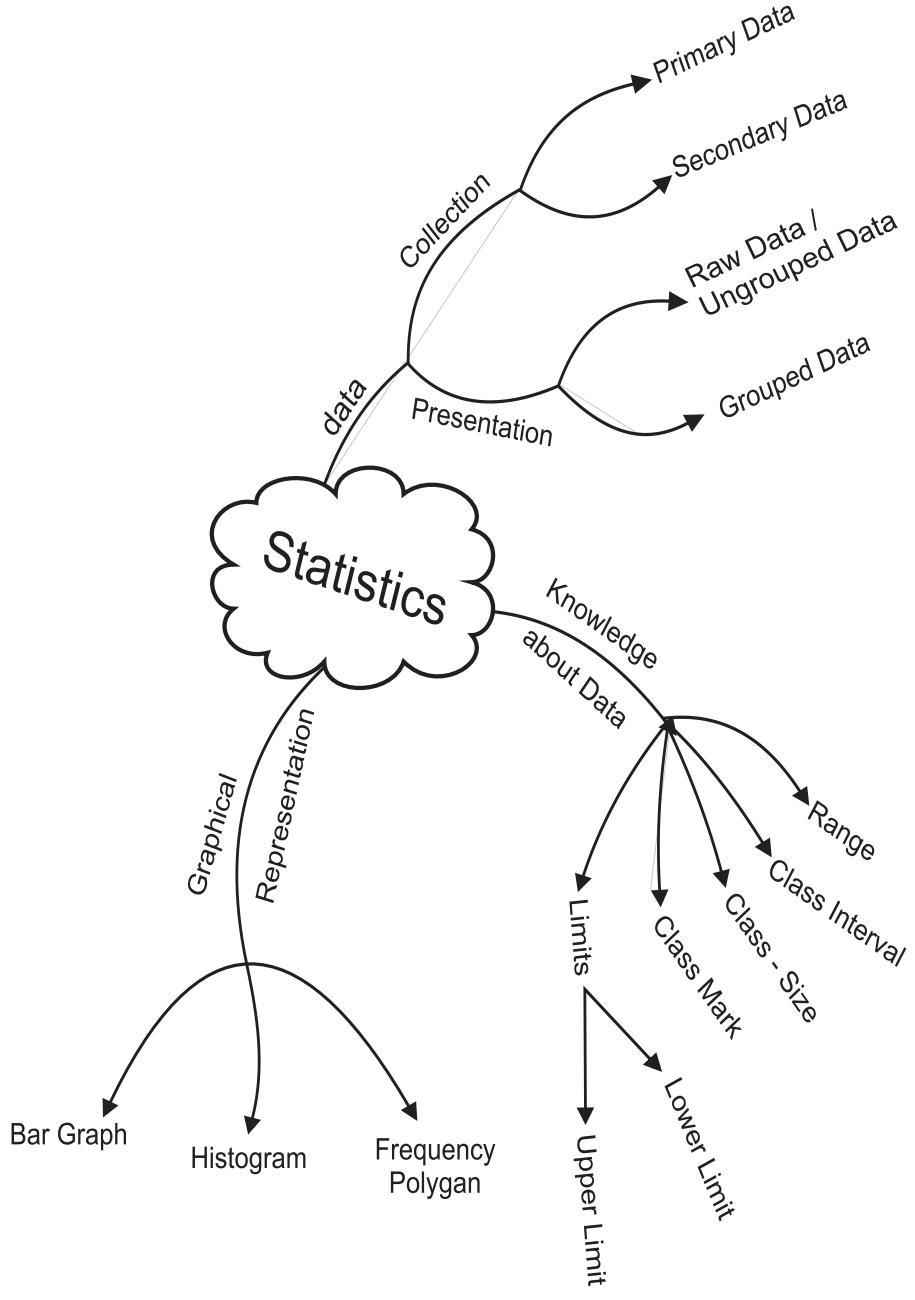
CHAPTER-12

STATISTICS

MIND MAP



Key points

- In statistics we study collection, presentation, analysis and interpretation of data.
- The facts or figures collected with a definite purpose are called data.
- The number of times an observation occurs in the given data is called frequency of the observation.
- Class intervals are the groups in which all observations are divided.
- For class-interval 20-30, 30 is called upper class limit and 20 is called lower class limit.
- Class mark = $\frac{\text{Lower class limit + upper class limit}}{2}$

Very Short Answer type Questions (1 Mark)

1. The facts or figures, collected with a definite purpose are:

(a) Frequency (b) Data

(c) Tally Marks (d) Bars

2. To compare this years result with last years result, teacher went to the class and collected this years number of distinctions from the students. For last years number of distinctions, she opened the result register and wrote the required number of distinctions. The data collected by her from the students and register respectively, are examples of:

(a) Primary data & secondary data

(b) Primary data & raw data

(c) Both primary data

(d) Secondary data & Primary data

3. How is histogram different from bar graph.

(a) Histogram is same as bar graph but joined together.

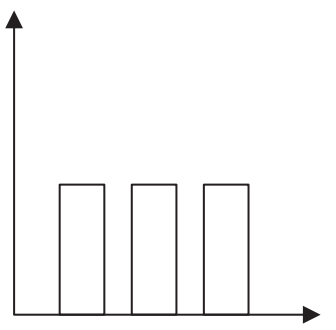
(b) no difference

(c) Class- intervals are used in histogram.

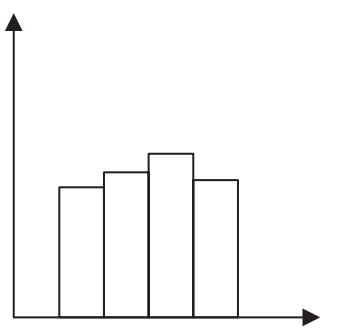
(d) A and B both are correct.

4. Which of the figures represent a histogram correctly:

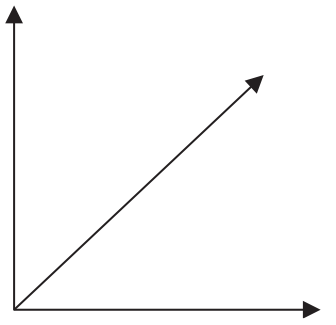
(a)



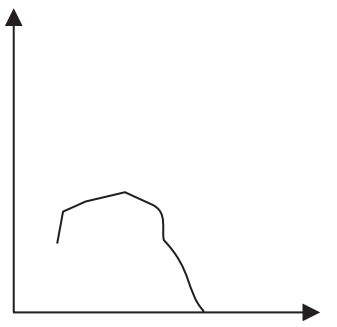
(b)



(c)



(d)



5. In a histogram when we join midpoints of the tops of the rectangles (bars) we get:

(a) Bar Graph (b) line graph

(c) Frequency Polygon (d) Pie graph

6. To draw a frequency polygon, we need _____ of the class interval for x-axis and frequency of the respective class for y-axis.

(a) upper limit (b) lower limit

(c) class-mark (d) range

7. In a continuous frequency distribution, class mark of a class is 15 and lower limit is 13, then its upper limit is:

(a) 16 (b) 14

(c) 13 (d) 17

8. If class mark of a class-interval is 8.5 and the class size is 5, then the class limits of the corresponding class-interval is:

(a) 6.5 - 11.5 (b) 6 - 11

(c) 5.5 - 10.5 (d) 7 - 12

9. Let x be the class mark and I be the upper limit of a class-interval in a continuous frequency-distribution.

The lower limit of the class is:

(a) $2x + y$ (b) $2x - y$

(c) $x - y$ (d) $x + y$

10. The difference between the highest and lowest values of the data is called _____ of that observations.

11. The marks of 5 students in a subject out of 50 are 32, 48, 50, 27 and 37, the range is _____.

12. A set of data contains 64 as the highest value and its range is 13, the lowest value of the data is _____.

13. The mid point of a class is called _____.

14. The class mark of the class interval 4.7-6.3 is _____.

15. Class size of class intervals 5.5-15.5, 15.5-25.5, 25.5-35.5 is _____.

Short Answer type-I Questions (2 Marks)

16. If class mark of a class-interval is 18.5 and the class size is 5, find the class limit of the corresponding class interval.

17. In a continuous frequency distribution, class mark of a class is 15 and lower limit is 13. Find its upper limit.

18. The class marks of a continuous distribution are 3.05, 3.15, 3.25, 3.35, 3.45, and 3.55. Find the class interval corresponding to the class mark 3.35

19. The weight (in kg) of 25 students are given below 35, 38, 36, 37, 38, 35, 37, 36, 35, 38, 36, 36, 35, 35, 38, 37, 35, 36, 38, 38, 35, 35, 36, 38, 37

Complete the following frequency table:

Weights :	35	36	37	38
Frequency :	____	____	____	____

20. The class marks of a distribution are 104, 114, 124, 134. Determine the class size and the class limits.

21. Following data gives the number of children in 30 families.

2, 1, 0, 3, 4, 2, 4, 3, 0, 1, 2, 4, 5, 3, 2, 2, 2, 1, 1, 1, 0,2, 0, 3, 2, 1, 0, 4, 5, 1

represent it in the form of a frequency distribution.

Short Answer type-II Questions (3 Marks)

22. Given below are the runs scored by 18 players in one day cricket match:

3, 7, 16, 27, 46, 122, 73, 24, 7, 3, 0, 8, 46, 3, 99, 45, 28, 79

Form a frequency table for above data with equal class intervals one of these being 0-25 (excluding 25). Which class has maximum frequency?

23. The time taken (in second) by 25 students in an examination to solve certain questions is given below.

20, 16, 20, 27, 27, 28, 30, 33, 37, 50, 40, 42, 46, 28, 43, 46, 46, 48, 49, 52, 58, 59, 60, 64, 52

By taking class interval of size 10, make a frequency distribution table. Which class has minimum frequency?

24. Draw the histogram from the following data

Class	0-10	10-20	20-30	30-40	40-50
Frequency	8	15	20	12	16

25. Given below is a cumulative frequency distribution table showing the marks scored by 50 students of a class.

Marks	Number of students
Below 20	17
Below 40	22
Below 60	29
Below 80	37
Below100	50

Form a frequency table from the above data.

26. Given below are the seats won by different political parties in a state assembly election :

Political Party	*A*	*B*	*C*	*D*	*E*	*F*	*G*
Seat won	75	55	37	29	10	37	50

Draw a bar graph for above data.

Long Answer type Questions (5 Marks)

27. Given below is the data of students who participated in different activities.

Activity	Sports	Meditation	Yoga	Walking
No. of Girls	42	35	100	120
No. of Boys	90	64	130	86

Draw double bar graph. Which has maximum number of boys?

28. Draw histogram to represent the data given below.

Age (in years)	No of children
1-2	5
2-3	4
3-5	10
5-7	12
7-10	9
10-15	10
15-17	8

29. Construct a histogram from the following distribution of total marks obtained by 40 students of IX class in a test.

Class Marks (mid point)	5	15	25	35	45	55
No. of Students	3	7	6	14	8	2

30. For the following data, draw a frequency polygon.

Marks obtained	10-20	20-30	30-40	40-50	50-60
No. of Students	6	8	3	9	4

31. Draw a frequency polygon for the following data

Marks	Frequency
0-10	03
10-20	09
20-30	18
30-40	16
40-50	12
50-60	02

32. The blood group of 30 students of class IX are recorded as follows. If O is a universal donar and AB is a universal recipient then –

A, B, B, B, O, B, B, A, AB, A, O, B, O, AB, O

AB, AB, B, AB, B, A, O, AB, B, A, O, AB, A, A, AB

(a) Make a frequency distribution table for the above data.

(b) Mr. '*X*' meets an accident and needs blood. His blood group is AB. How many of these students are universal donors and how many are universal recipients?

33. A doctor suggests two ways for treatment of a particular disease one by taking medicine only and other by doing meditation and yoga.

Age group	No. of patients taking medicines	No. of patients doing meditation and yoga
20-30	20	05
30-40	30	12
40-50	42	20
50-60	40	30
60-70	30	20

Represent the data of both the ways of treatment on the same graph by two frequency polygons.

34. The following table shows number of voluntary blood donors per day in voluntary blood donation camp organized in Delhi.

Days	No. of Donors
Sunday	100
Monday	80
Tuesday	110
Wednesday	80
Thursday	60
Friday	70
Saturday	120

(i) Draw a bar graph showing above information.

(ii) On which day donation was maximum and on which day it was minimum?

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STATISTICS

Answers

1. (b) Data

2. (d) Secondary data and Primary data

3. (c) Class intervals is used in histogram.

4. (b)

5. (c) Frequency polygon

6. (c) class mark

7. (d) 17

8. (b) 6-11

9. (b) $2x - y$

10. Range

11. 23

12. 51

13. class mark

14. 5.5

15. 10

16. 16-21

17. 17

18. 3.3-3.4

19.

Weight	35	36	37	38
Frequency	8	6	4	7

20. class size = 10
class limits = 99-109, 109-119, 119-129, 129-139

21.

No. of Children	Tally Marks	No. of Families
0	𝍸	5
1	𝍸 ||	7
2	𝍸 |||	8
3	||||	4
4	||||	4
5	||	2

22.

Class-Interval	Tally Marks	Frequency
0–25	𝍸 ||||	9
25–50	𝍸	5
50–75	|	1
75–100	||	2
100–125	|	1

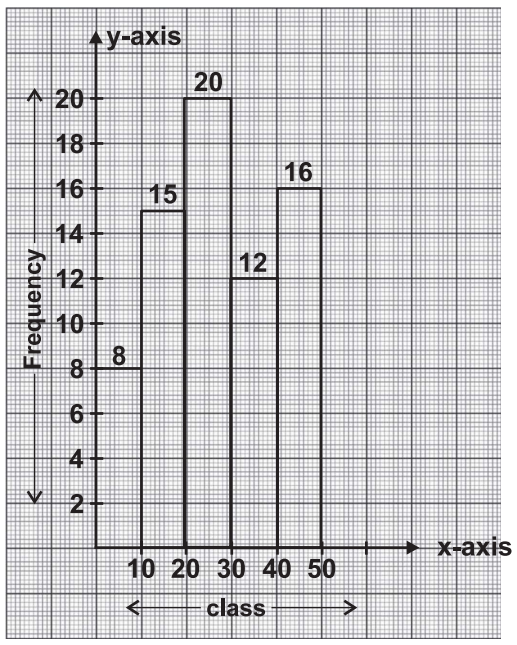
0 - 25 has maximum frequency.

23.

Class-Interval	Tally Marks	Frequency
15–25	|||	3
25–35	𝍸 |	6
35–45	||||	4
45–55	𝍸 |||	8
55–65	||||	4

15 - 25 has minimum frequency.

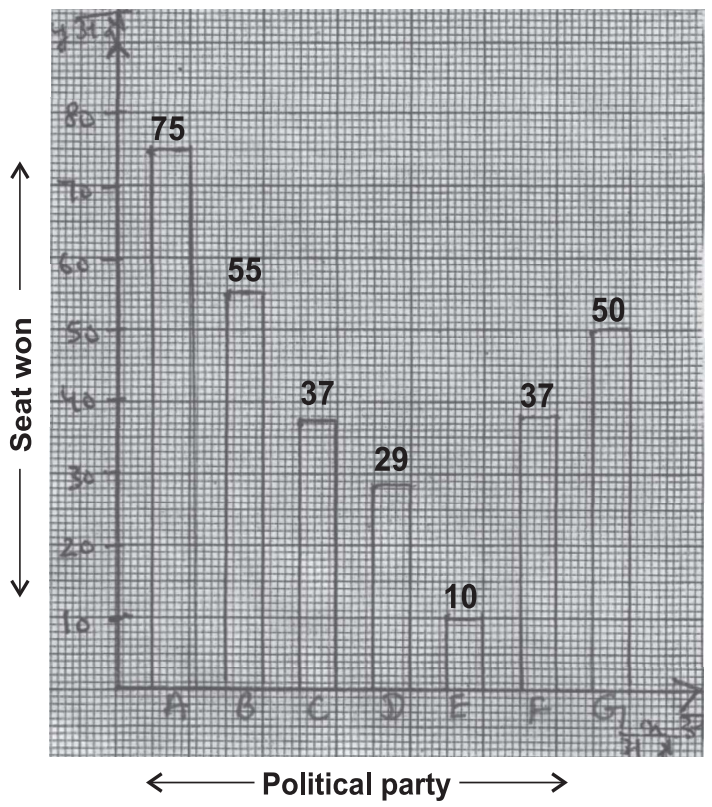
24.



25.

Class-Interval	Frequency
0-20	17
20-40	5
40-60	7
60-80	8
80-100	13

26.



Chapter - 12
STATISTICS
Practice Paper

Time : 1 Hr. **M.M. 20**

1. Write class limits of the following class marks: (1)

47, 52, 57, 62, 67, 72, 77

2. The class-mark of class interval 8-15 is _____ (1)

3. The following data gives the number of children in 20 families: (2)

1, 2, 0, 3, 2, 1, 0, 4, 3, 2, 2, 0, 1, 2, 3, 2, 2, 0, 4, 3

Represent it in the form of a frequency distribution.

4. The class marks of a distribution are 25, 35, 45, 55, 65. Determine the class size and the class limits. (2)

5. The time taken (in seconds) by 25 students in an examination to solve certain question is given below: (3)

18, 22, 17, 25, 27, 33, 35, 19, 21, 20, 17, 16, 25, 27, 33, 34, 38, 42, 43, 41, 37, 22, 19, 44, 36

By taking class intervals of size 10, make a frequency distribution table.

6. Given below is a cumulative frequency distribution table showing the marks scored by 50 students of a class: (3)

Marks	Below 20	Below 40	Below 60	Below 80	Below 100
No. of students	17	22	29	37	50

Form a frequency table from the above data.

7. Draw the histogram from the following data : (3)

Age (in yrs)	18-20	20-22	22-24	24-26	26-28	28-30
No. of persons	5	4	6	9	7	2

8. Given below is the data of students who participated in different activities. (5)

Activity	Sports	Meditation	Yoga	Walking
No. of girls	25	32	17	27
No. of boys	35	18	22	25

Draw double bar graph. Which Activity has maximum number of girls and which has minimum number of boys ?

ASSERTION REASONING BASED QUESTIONS

In the following questions, there is one Assertion (A) and one reason (R). Choose the correct answer of these questions from the four options (a), (b), (c) and (d) given below:

(a) Both A and R are correct and R is the correct explanation of the assertion
(b) Both A and R are correct but R is not the correct explanation of the assertion
(c) A is true but R is false.
(d) A is false but R is true.

1. Assertion (A) : $\sqrt{5}$ is an irrational number
   Reason (R) : A number is called irrational, if it can not be written in the form p/q, where p and q are integers and $q \neq 0$.
2. Assertion (A) : 7 is rational number.
   Reason (R) : The square root of all rational numbers is irrational.
3. Assertion (A) : 0.258..... is a terminating decimal.
   Reason (R) : A decimal in which a digit or a set of digits is repeated periodically is called a repeating or a recurring decimal .
4. Assertion (A) : The degree of the polynomial $(x^2 - 2)(x - 3)(x + 4)$ is 3.
   Reason (R) : A polynomial of degree 3 is called a cubic polynomial.
5. Assertion(A) : –7 is a constant polynomial.
   Reason (R) : The degree of a constant polynomial is zero.
6. Assertion(A) : The expression $3x^4 - 4x^{3/2} + x^2 = 2$ is not a polynomial because the term $-4x^{3/2}$ contains a rational power of x.
   Reason (R) : The highest exponent in various terms of an algebraic expression in one variable is called its degree.
7. Assertion (A) : The point (–2, 0) lies on the y-axis and (0, 4) lies on the x-axis.
   Reason (R) : Every point on the x-axis has zero distance from the x-axis and every point on the y-axis has zero distance from the y-axis.
8. Assertion (A) : The abscissa of a point (5, 2) is 5.
   Reason (R) : The perpendicular distance of a point from the y-axis is called its abscissa.
9. Assertion (A) : If the ordinate of a point is equal to its abscissa, then the point will lie either in the first quadrant or in the fourth quadrant.

Reason (R) : A point whose both coordinates are negative will lie in the third quadrant.

10. Assertion (A) : The values of a, b and c in linear equation $9y = 2x + 9$ are 2, –9 and 9 respectively.
    Reason (R) : The general form of linear equation in two variables is $ax + by + c = 0$

11. Assertion (A) : The equation $9x = 100$ is parallel to y-axis.
    Reason (R) : The graph of $x = a$ is a straight line parallel to the y-axis

12. Assertion (A) : $x + y = 9$ has only two solutions (0, 9) and (9, 0).
    Reason (R) : Every linear equation in two variables has infinitely many solutions.

13. Assertion (A) : Parallel lines are those lines which never intersect each other.
    Reason (R) : Two or more lines can be parallel.

14. Assertion (A) : An infinite number of lines can be drawn to pass through a given point.
    Reason (R) : A line segment has two end-points.

15. Assertion (A) : Raj and Ali have the same weight. If each gain weight by 3 kg, then second Euclid's axiom will be used to compare their weights.
    Reason (R) : According to Euclid's second axiom, when equals are added to equals the wholes are equal.

16. Assertion (A) : An angle exceeds its complement by 20°, then the angle is 52°.
    Reason (R) : Two angles are said to be complementary if the sum of the measures of their angles is 90°.

17. Assertion (A) : If $a = 35°$ and $b = 155°$, then angles 'a' and 'b' form a linear pair of angles.
    Reason (R) : The sum of a linear pair of angles is always 180°.

18. Assertion (A) : If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 5 : 4, then the larger of the two angles is 100°.
    Reason (R) : If a transversal intersects two parallel lines, then the sum of the interior angles on the same side of the transversal is 180°.

19. Assertion (A) : If $\Delta ABC \cong \Delta PQR$ by SSS congruence rule then AB = QR.
Reason (R) : If two triangles are congruent then corresponding parts of congruent triangles are equal.

20. Assertion (A) : Two angles measures a° and 3a-80°. If each angle is opposite to equal sides of an isosceles triangle, then the value of a is 40°.
Reason (R) : The sides opposite to equal angles of a triangle are equal.

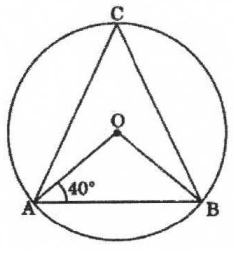
21. Assertion : All the sides of a square are of equal length.
Reason (R) : All squares are congruent.

22. Assertion(A) : The angles of a quadrilateral are$x°$, $(x - 10)°$, $(x + 30)°$ and $(2x)°$. The smallest angle is equal to 58°.
Reason(R) : The sum of the angles of a quadrilateral is 360°.

23. Assertion(A) : The adjacent sides of a quadrilateral have one common point.
Reason(R) : The opposite sides of a quadrilateral have two common point.

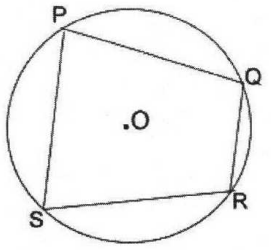
24. Assertion(A) : Every square is rhombus.
Reason(R) : Every rhombus is a square.

25. Assertion (A) : In the figure, $\angle ACB = 50°$.
Reason (R) : The angle in the semicircle is a right angle.



26. Assertion (A) : The part of a circle cut from the chord is sector of the circle.
Reason (R) : A sector of a circle is the region between its radii and arc.

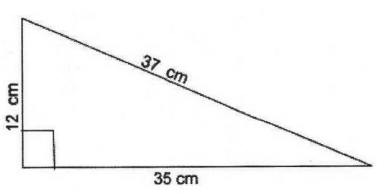
27. Assertion (A) : In figure, PQRS is a cyclic quadrilateral.
Reason (R) : The opposite angles of a cyclic quadrilateral are supplementary.



28. Assertion (A) : If the sides of a triangle are 6 cm, 11 cm and 23 cm then the value of 's' is 40 cm.
Reason (R) : 's' is the semi-perimeter of the triangle.

29. Assertion (A) : The area of an equilateral triangle having side a is given by $\frac{\sqrt{3}}{4} a^2$.
Reason (R) : The area of an equilateral triangle cannot be found using Heron's formula.

30. Assertion (A) : The area of the given right angled triangle is 210 cm^2.
Reason (R) : The general formula to find the area of triangle is $\sqrt{\frac{1}{2}} \times$ base $\times$ height



31. Assertion (A) : If the curved surface area of a sphere is $64\pi r^2$, then the radius of the sphere is $2r$.
Reason (R) : The volume of a sphere is $\frac{4}{3}\pi r^3$.

32. Assertion (A) : The slant height of a cone is $l = h^2 - r^2$, where h is the height and r is the radius
Reason (R) : The slant height l, height h and radius r of a cone are the sides of a right angled triangle.

33. Assertion (A) : The curved surface area of the hemisphere is 25.12 cm^2
Reason (R) : The diameter of the hemisphere is 4 cm.

34. Assertion (A) : Range = Maximum value – Minimum value
Reason (R) : The range of the first 6 multiples of 6 is 9.

35. Assertion (A) : The class mark of the class interval 90-120 is 105.
Reason(R) : Class mark = $\frac{1}{2}$ (upper limit + lower limit)

36. Assertion(A) : For class intervals 10-20, 20-30, 20 is included in interval 20-30.
Reason(R) : The number is always included in the lower limit of the class interval.

ANSWERS

Assertion Reasoning Based Questions

1. (a) Both A and R are correct and R is the correct explanation of the assertion
2. (c) A is true but R is false.
3. (d) A is false but R is true.
4. (d) A is false but R is true.
5. (a) Both A and R are correct and R is the correct explanation of the assertion.
6. (b) Both A and R are correct but R is not the correct explanation of the assertion.
7. (a) Both A and R are correct and R is the correct explanation of the assertion.
8. (a) Both A and R are correct and R is the correct explanation of the assertion
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20. (d) A is false but R is true.
21. (c) A is true but R is false.
22. (a) Both A and R are correct and R is the correct explanation of the assertion.

23. (c) A is true but R is false.

24. (c) A is true but R is false.

25. (b) Both A and R are correct but R is not the correct explanation of the assertion.

26. (d) A is false but R is true.

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33. (a) Both A and R are correct and R is the correct explanation of the assertion.

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35. (a) Both A and R are correct and R is the correct explanation of the assertion.

36. (a) Both A and R are correct and R is the correct explanation of the assertion.