



SECTION - A

This section consists of 20 questions of 1 mark each.

$20 \times 1 = 20$

1. Which term of the A.P. $-29, -26, -23, \dots, 61$ is 16?

(A) 11th

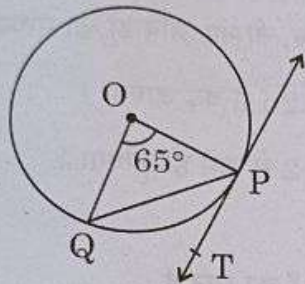
(B) 16th

(C) 10th

(D) 31st

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2. In the given figure, PT is tangent to a circle with centre O. Chord PQ subtends an angle of 65° at the centre. The measure of $\angle QPT$ is:



(A) 65°

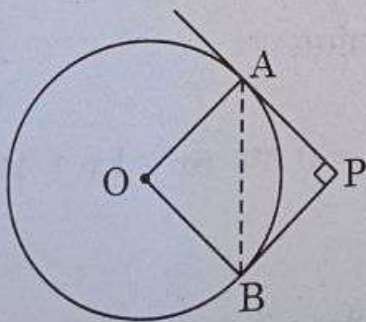
(B) 57.5°

(C) 67.5°

(D) 32.5°

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3. In the given figure, tangents PA and PB to the circle centred at O, from point P are perpendicular to each other. If $PA = 5$ cm, then length of AB is equal to



(A) 5 cm

(B) $5\sqrt{2}$ cm

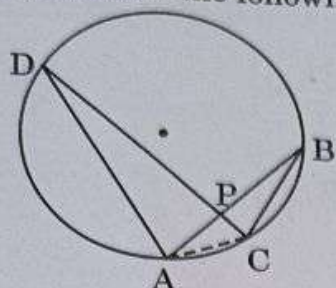
(C) $2\sqrt{5}$ cm

(D) 10 cm

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4. AB and CD are two chords of a circle intersecting at P. Choose the correct statement from the following : 1



- (A) $\triangle ADP \sim \triangle CBA$ (B) $\triangle ADP \sim \triangle BPC$
(C) $\triangle ADP \sim \triangle BCP$ (D) $\triangle ADP \sim \triangle CBP$

5. If value of each observation in a data is increased by 2, then median of the new data 1

- (A) increases by 2 (B) increases by $2n$
(C) remains same (D) decreases by 2

6. If α and β are zeroes of the polynomial $2x^2 - 9x + 5$, then value of $\alpha^2 + \beta^2$ is 1

- (A) $\frac{1}{4}$ (B) $\frac{61}{4}$
(C) 1 (D) $\frac{71}{4}$

7. After an examination, a teacher wants to know the marks obtained by Maximum number of the students in her class. She requires to calculate _____ of marks.

- (A) median (B) mode
(C) mean (D) range

8. The value of k for which the system of equations $3x - y + 8 = 0$ and $6x - ky + 16 = 0$ has infinitely many solutions, is

- (A) -2 (B) 2
(C) $\frac{1}{2}$ (D) $-\frac{1}{2}$



9. Point P divides the line segment joining the points A(4, -5) and B(1, 2) in the ratio 5:2. Co-ordinates of point P are

(A) $\left(\frac{5}{2}, \frac{-3}{2}\right)$ (B) $\left(\frac{11}{7}, 0\right)$
(C) $\left(\frac{13}{7}, 0\right)$ (D) $\left(0, \frac{13}{7}\right)$

1

10. A box contains cards numbered 6 to 55. A card is drawn at random from the box. The probability that the drawn card has a number which is a perfect square, is

(A) $\frac{7}{50}$ (B) $\frac{7}{55}$
(C) $\frac{1}{10}$ (D) $\frac{5}{49}$

1

11. If $\sin \theta = \cos \theta$, ($0^\circ < \theta < 90^\circ$), then value of $(\sec \theta \cdot \sin \theta)$ is :

(A) $\frac{1}{\sqrt{2}}$ (B) $\sqrt{2}$
(C) 1 (D) 0

1

12. Two dice are rolled together. The probability of getting the sum of the two numbers to be more than 10, is

(A) $\frac{1}{9}$ (B) $\frac{1}{6}$
(C) $\frac{7}{12}$ (D) $\frac{1}{12}$

1

13. Value of k for which $x = 2$ is a solution of the equation $5x^2 - 4x + (2 + k) = 0$, is

(A) 10 (B) -10
(C) 14 (D) -14

1



14. The perimeters of two similar triangles ABC and PQR are 56 cm and 48 cm respectively. PQ/AB is equal to

(A) $\frac{7}{8}$

(B) $\frac{6}{7}$

(C) $\frac{7}{6}$

(D) $\frac{8}{7}$

1

15. The sum of first 200 natural numbers is

(A) 2010

(B) 2000

(C) 20100

(D) 21000

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16. If the HCF (2520, 6600) = 40 and LCM (2520, 6600) = $252 \times k$, then the value of k is

(A) 1650

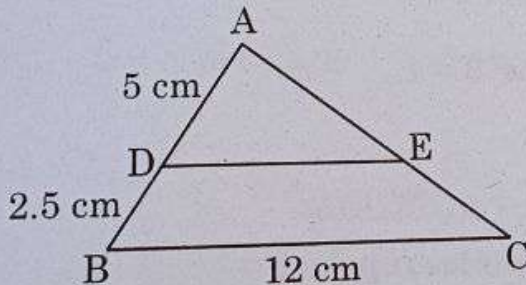
(B) 1600

(C) 165

(D) 1625

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17. In the given figure $\triangle ABC$ is shown. DE is parallel to BC. If AD = 5 cm, DB = 2.5 cm and BC = 12 cm, then DE is equal to



(A) 10 cm

(B) 6 cm

(C) 8 cm

(D) 7.5 cm

1

18. XOYZ is a rectangle with vertices $X(-3, 0)$, $O(0, 0)$, $Y(0, 4)$ and $Z(x, y)$. The length of its each diagonal is

(A) 5 units

(B) $\sqrt{5}$ units

(C) $x^2 + y^2$ units

(D) 4 units

1



Directions : In Question 19 and 20, Assertion (A) and Reason (R) are given. Select the correct option from the following :

- (A) Both Assertion (A) and Reason (R) are true. Reason (R) is the correct explanation of Assertion (A).
- (B) Both Assertion (A) and Reason (R) are true. Reason (R) does not give correct explanation of (A).
- (C) Assertion (A) is true but Reason (R) is not true.
- (D) Assertion (A) is not true but Reason (R) is true.

19. **Assertion (A) :** Two cubes each of edge length 10 cm are joined together.
The total surface area of newly formed cuboid is 1200 cm^2 .

Reason (R) : Area of each surface of a cube of side 10 cm is 100 cm^2 . *D*

1

20. **Assertion (A) :** If $\sin A = \frac{1}{3}$ ($0^\circ < A < 90^\circ$), then the value of $\cos A$ is $\frac{2\sqrt{2}}{3}$

Reason (R) : For every angle θ , $\sin^2 \theta + \cos^2 \theta = 1$. *A, D*

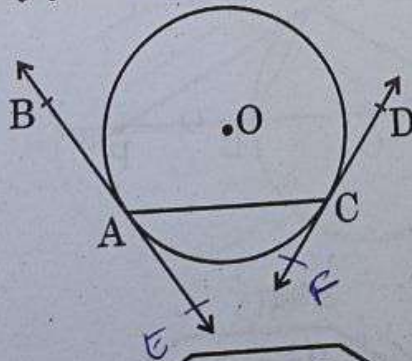
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SECTION - B

In this section, there are 5 questions of 2 marks each.

21. In the given figure, AB and CD are tangents to a circle centred at O. Is $\angle BAC = \angle DCA$? Justify your answer.

2



22. (a) In what ratio is the line segment joining the points $(3, -5)$ and $(-1, 6)$ divided by the line $y = x$? 2

OR

- (b) $A(3, 0)$, $B(6, 4)$ and $C(-1, 3)$ are vertices of a triangle ABC . Find length of its median BE . 2

23. Explain why $7 \times 11 \times 13 + 13$ and $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$ are composite numbers. 2

24. The vertices of a ΔABC are $A(-2, 4)$, $B(4, 3)$ and $C(1, -6)$. Find length of the median BD . 2

25. (a) Evaluate : $2 \sin^2 30^\circ \sec 60^\circ + \tan^2 60^\circ$. 2

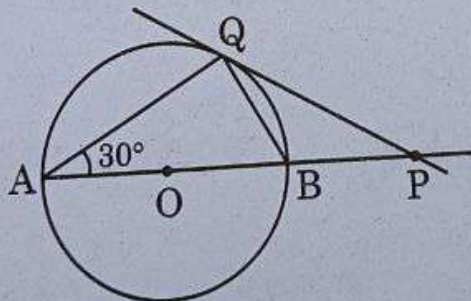
OR

- (b) If $2 \sin (A + B) = \sqrt{3}$ and $\cos (A - B) = 1$, then find the measures of angles A and B . $0 \leq A, B, (A + B) \leq 90^\circ$. 2

SECTION - C

This section consists of 6 questions of 3 marks each.

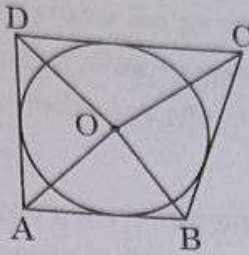
26. (a) In the given figure, PQ is tangent to a circle centred at O and $\angle BAQ = 30^\circ$; show that $BP = BQ$. 3



OR

- (b) In the given figure, AB, BC, CD and DA are tangents to the circle with centre O forming a quadrilateral ABCD.

Show that $\angle AOB + \angle COD = 180^\circ$



27. In a test, the marks obtained by 100 students (out of 50) are given below :

Marks obtained :	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
Number of students :	12	23	34	25	6

Find the mean marks of the students.

28. Three consecutive integers are such that sum of the square of second and product of other two is 161. Find the three integers.

29. (a) If the sum of first m terms of an A.P. is same as sum of its first n terms ($m \neq n$), then show that the sum of its first $(m + n)$ terms is zero.

OR

- (b) In an A.P., the sum of three consecutive terms is 24 and the sum of their squares is 194. Find the numbers.

30. Prove that $\sqrt{5}$ is an irrational number.

31. Prove that $\sin^6 \theta + \cos^6 \theta = 1 - 3 \sin^2 \theta \cos^2 \theta$.



$$\begin{array}{c|c|c|c} x & & & \\ \hline & -7 & -2 & -1 \end{array}$$

$$\begin{array}{c|c|c} 0 & -1 & -2 \\ \hline 2 & -1 & -4 \end{array}$$

SECTION - D

This section consists of 4 questions of 5 marks each.

32. The angle of elevation of an aircraft from a point A on the ground is 60° . After a flight of 30 seconds, the angle of elevation changes to 30° . The aircraft is flying at a constant height of $3500\sqrt{3}$ m at a uniform speed. Find the speed of the aircraft. 5
33. If the length of a rectangle is reduced by 5 cm and its breadth is increased by 2 cm, then the area of the rectangle is reduced by 80 cm^2 . However, if we increase the length by 10 cm and decrease the breadth by 5 cm, its area is increased by 50 cm^2 . Find the length and breadth of the rectangle. 5
34. (a) Using graphical method, solve the following system of equations : 5
 $3x + y + 4 = 0$ and $3x - y + 2 = 0$
OR
- (b) Tara scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks been deducted for each wrong answer, then Tara would have scored 50 marks. Assuming that Tara attempted all questions, find the total number of questions in the test. 5
35. (a) If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then prove that the other two sides are divided in the same ratio. 5
OR
- (b) Sides AB and AC and median AD to $\triangle ABC$ are respectively proportional to sides PQ and PR and median PM of another triangle PQR. Show that $\triangle ABC \sim \triangle PQR$. 5



SECTION - E

This section consists of 3 case based questions of 4 marks each.

36. The word 'circus' has the same root as 'circle'. In a closed circular area, various entertainment acts including human skill and animal training are presented before the crowd.

A circus tent is cylindrical upto a height of 8 m and conical above it. The diameter of the base is 28 m and total height of tent is 18.5 m.



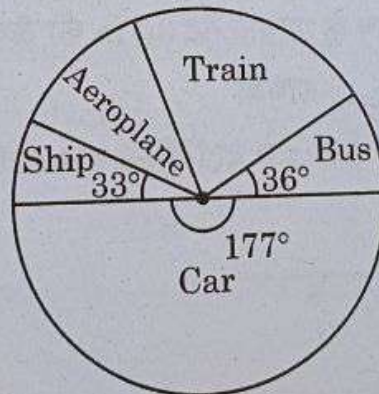
Based on the above, answer the following questions :

- (i) Find slant height of the conical part. 1
(ii) Determine the floor area of the tent. 1
(iii) (a) Find area of the cloth used for making tent. 2

OR

- (iii) (b) Find total volume of air inside an empty tent. 2

37. In a survey on holidays, 120 people were asked to state which type of transport they used on their last holiday. The following pie chart shows the results of the survey.



Observe the pie chart and answer the following questions :

- (i) If one person is selected at random, find the probability that he/she travelled by bus or ship.



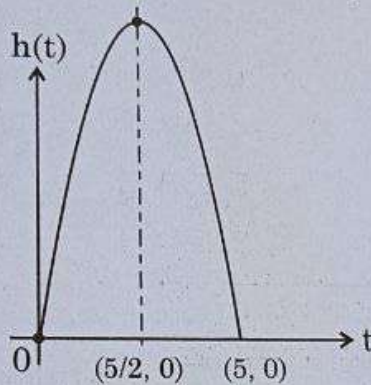
(ii) Which is most favourite mode of transport and how many people used it? 1

(iii) (a) A person is selected at random. If the probability that he did not use train is $\frac{4}{5}$, find the number of people who used train. 2

OR

(iii) (b) The probability that randomly selected person used aeroplane is $\frac{7}{60}$. Find the revenue collected by air company at the rate of ₹ 5,000 per person. 2

38. A ball is thrown in the air so that t seconds after it is thrown, its height h metre above its starting point is given by the polynomial $h = 25t - 5t^2$.



Observe the graph of the polynomial and answer the following questions :

(i) Write zeroes of the given polynomial. 1

(ii) Find the maximum height achieved by ball. 1

(iii) (a) After throwing upward, how much time did the ball take to reach to the height of 30 m? 2

OR

(iii) (b) Find the two different values of t when the height of the ball was 20 m. 2