

Time : 3 Hrs.

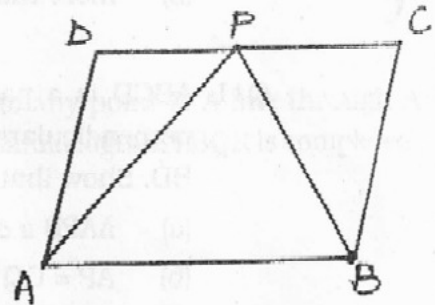
M.M.: 90

General Instructions :

- All questions are compulsory.
- The question paper consists of 31 questions divided into five sections A, B, C, D and E. Section-A comprises of 4 questions of 1 mark each. Section-B comprises of 6 questions of 2 marks each. Section-C comprises of 8 questions of 3 marks each. Section-D comprises of 10 questions of 4 marks each. Section-E comprises of 2 questions of 3 marks each and 1 question of 4 marks. This section is based on Open Text Based Assessment (OTBA).
- Use of calculator is not permitted.

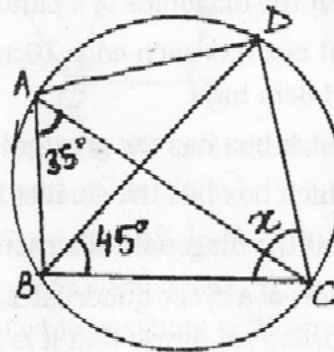
SECTION-A

- Q1. Diameter of the base of a cone is 10.5cm and its slant height is 10cm. Find its curved surface area.
- Q2. Find the value of k , if $x = 3$, $y = 1$ is a solution of the equation $2x + 5y = k$.
- Q3. In a sample study of 642 people, it was found that 514 people have a high school certificate. If a person is selected at random, what is the probability that the person does not have a high school certificate?
- Q4. Find the area of parallelogram ABCD, if $ar(\triangle APB) = 15\text{cm}^2$.



SECTION-B

- Q5. Check whether $(-1, 0)$ and $(0, 3)$ are solutions of the equation $x + 2y = 6$ or not.
- Q6. In the given figure, if $\angle DBC = 45^\circ$ and $\angle BAC = 35^\circ$, then find the value of x .



- Q7. The following table shows the marks scored by a group of 50 students in a test of 100 marks.

Marks	0-20	20-40	40-60	60-80	80-100
Number of students	10	15	8	12	5

Find the probability that a student obtained:

- less than 20% marks.
 - more than or equal to 60% marks.
- Q8. The total surface area of a cube is 216cm^2 . Find the volume of the cube.
- Q9. Write the equation of any two lines passing through the point $(5, -2)$.
- Q10. The following data regarding the number of children in a family was collected for 1600 families.

Number of children	0	1	2	3	more than 3
Number of families	55	550	470	360	165

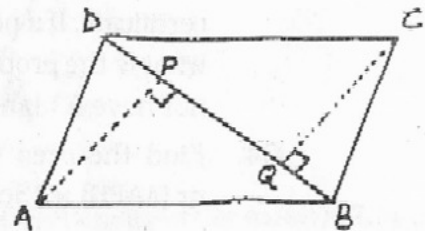
If a family is selected at random, find the probability that it has

- no child
- more than two children.

SECTION-C

- Q11. ABCD is a parallelogram and AP and CQ are perpendiculars from vertices A and C on diagonal BD. Show that

- $\triangle APB \cong \triangle CQD$
- $AP = CQ$



- Q12. Construct a $\triangle ABC$, given that $AC = 8\text{cm}$, $\angle A = 60^\circ$ and $AB + BC = 15\text{cm}$.
- Q13. Write any three solutions of the equation:
 $5x + 4y = 20$
- Q14. Show that the diagonals of a parallelogram divide it into four triangles of equal area.
- Q15. A cubical box has each edge 10cm and another cuboidal box is 12.5cm long, 10cm wide and 8cm high.
- Which box has the greater lateral surface area and by how much?
 - Which box has the smaller total surface area and by how much?
- Q16. Show that the diagonals of a rhombus are perpendicular to each other.
- Q17. If diagonals of a cyclic quadrilateral are diameters of the circle through the vertices of the quadrilateral, prove that it is a rectangle.

Q18. The table given below shows the ages of 80 teachers in a school.

Age (in years)	20-30	30-40	40-50	50-60
Number of teachers	11	32	30	7

A teacher from this school is chosen at random. What is the probability that the age of the selected teacher is

- (a) less than 30 years
- (b) above 60 years
- (c) 40 or more than 40 years?

SECTION-D

Q19. Give the geometric representation of $x = -7$ as an equation:

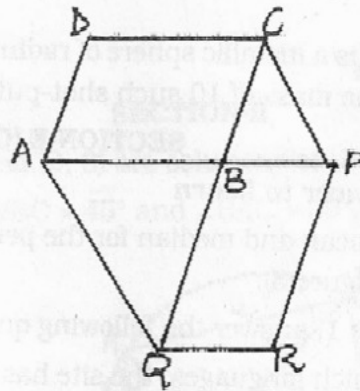
- (a) in one variable
- (b) in two variables

Q20. Construct a triangle PQR given that $\angle Q = 60^\circ$, $\angle R = 30^\circ$ and $PQ + QR + RP = 12.5\text{cm}$.

Q21. (a) Mr. Patnayak donated 10 cylindrical drums to a school hostel for storage of food items. If the radius and height of each drum is 70cm and 40cm respectively, find the total capacity of all the drums. If the cost of each drum is ₹500 per m^3 , find the total cost of the drums.

(b) Which value is being depicted here?

Q22. The side AB of a parallelogram ABCD is produced to any point P. A line through A and parallel to CP meets CB produced at Q and then parallelogram PBQR is completed. Show that $\text{ar}(\text{ABCD}) = \text{ar}(\text{PBQR})$.



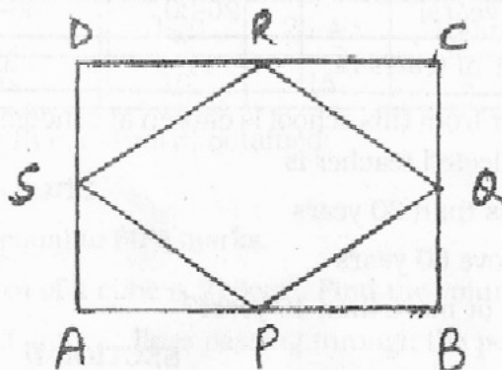
Q23. Prove: "The angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle."

Q24. Draw the graph of the equation $3x + 4y = 12$. Is (2, 3) a solution of the equation?

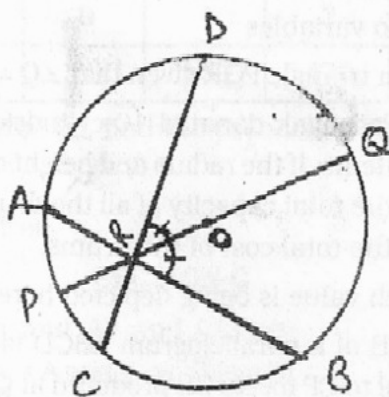
Q25. A dome of a building is in the form of a hemisphere. From inside, it was white washed at the cost of ₹616. If the cost of white washing is ₹2 per m^2 , find:

- (a) the inside surface area of the dome.
- (b) the volume of the air inside the dome.

- Q26. ABCD is a rectangle and P, Q, R and S are mid-points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rhombus.



- Q27. If two intersecting chords AB and CD of a circle with centre O make equal angles with the diameter passing through their point of intersection, prove that the chords are equal.



- Q28. A shot-putt is a metallic sphere of radius 4.9cm. If the density of the metal is 7.8g per cm^3 , find the mass of 10 such shot-putts.

SECTION-E (OTBA) (3+3+4)

Theme II : Empower to Learn

- Q29. Calculate mean and median for the percentage of campaigns conducted in different subjects (Figure 3).

- Q30. Using Table 1, answer the following questions:

- In which languages, the site has minimum and maximum users?
- In how many languages, there are less than 5% users? Name them.
- What is the difference between the percentage of the users of English and Serbian languages?

- Q31. Draw a histogram and frequency polygon to represent the data given in Table 2.