

#### General instructions:

1. All questions are compulsory.
2. The question paper consists of 32 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 10 questions of 3 marks each and Section – D comprises of 11 questions of 4 marks each. Section – E comprises of one question from Open Text theme of 10 marks.
3. There is no overall choice.
4. Use of calculator is not permitted.

#### SECTION – A

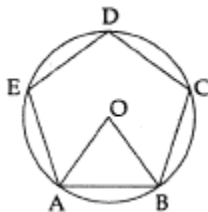
Question numbers 1 to 4 carry one mark each.

1. Cost of a pen is two and a half times the cost of a pencil. Express this situation as a linear equation in two variable.
2. The force applied on a body of mass 5 kg is directly proportional to the acceleration produced in the body. Represent this situation as a linear equation in two variable.
3. ABCD is a parallelogram with area as  $12 \text{ cm}^2$ . If BD is one of the diagonals of ABCD, find ar (ABD).
4. A cylinder of base radius  $r$  and height  $h$  is dipped vertically to half the height in a bucket full of purple paint. Find the area of the surface which gets painted.

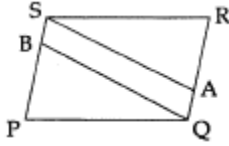
#### SECTION – B

Question numbers 5 to 10 carry two marks each.

5. In the given figure, O is the centre of a circle and A, B, C, D and E are points on the circle such that  $AB = BC = CD = DE = EA$ . Find the value of  $\angle AOB$ .



6. Construct an isosceles triangle if equal sides are of length 5.7 cm and included angle is  $60^\circ$ .
7. In the figure, PQRS is a parallelogram. If A and B are points on QR and PS respectively such that  $QA = \frac{1}{3} QR$  and  $SB = \frac{1}{3} SP$ , show that QASB is also a parallelogram.



8. The diameter of a metallic ball is 4.2 cm. If the density of the metal is 8.9 g per  $\text{cm}^3$ , find the mass of the ball.
9. The observations in ascending order are given below:  
29, 32, 48, 50,  $x$ ,  $x + 2$ , 72, 78, 84, 95  
If the median of the data is 63, find the unknown observations.
10. A coin is tossed 150 times and the outcomes are recorded as follows:

Outcomes	H	T
Frequency	85	65

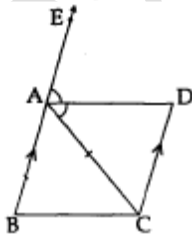
Compute the probability of

- One head
- One tail

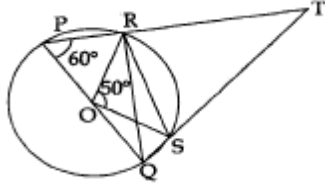
### SECTION – C

**Question numbers 11 to 20 carry three marks each.**

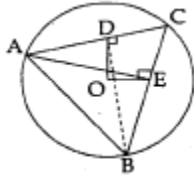
11. ABCD is a square. Coordinates of A and C are  $(-1, -1)$  and  $(1, 1)$  respectively. Write the coordinates of B and D. Also write equations of all the sides of the square.
12. The auto fare in a city are as follows: For the first kilometer it is Rs. 10 and for subsequent distance is Rs. 8 per km. Taking the distance as  $y$  km and total fare as Rs.  $x$ , write a linear equation for this and draw the graph. Also find the fare of 15 km.
13. In the adjoining figure,  $AB = AC$  and  $CD \parallel AB$ . AD is the bisector of  $\angle CAE$ . Show that ABCD is a parallelogram.



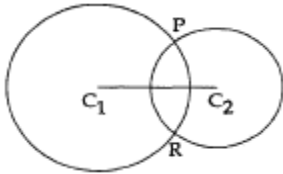
14. Construct triangle WXY if  $WX + XY + YW = 10$  cm and base angles are  $30^\circ$  and  $75^\circ$ .
15. In the given figure, O is the centre of the circle and PQ is a diameter of the circle. If  $\angle ROS = 50^\circ$  and  $\angle P = 60^\circ$ , find  $\angle RTS$ ,  $\angle RSQ$  and  $\angle POR$ .



16. In the given figure, O is the centre of the circle,  $OD \perp AC$ ,  $OE \perp BC$  and  $OD = OE$ . Show that  $\triangle DBA \cong \triangle EAB$ .



17. In the figure, two circles of radii  $x$  cm and  $y$  cm ( $x > y$ ) intersect at two points P and Q respectively. If the distance 'd' between the centres of two circles is given by  $d^2 = x^2 - y^2$ , prove that the length of the common chord is  $2y$  cm.



18. There is a solid cube which has been cut into two cuboids of equal volumes. Find the ratio of the total surface area of one of the cuboids to that of the given cube.
19. The average age of my family consisting of my parents and myself is 30 years. Ten years ago, the average of my parents were 23 years, find my present age.
20. 1500 families were surveyed and following data was recorded about their maids at homes:

Types of maids	Only part – time	Only full – time	Both
Number of maids	860	370	250

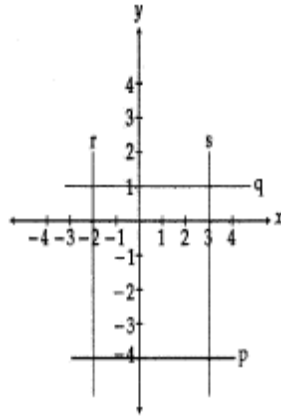
A family is selected at random. Find the probability that the family selected has:

- Both types of maids
- Has part – time maids
- Has no maids

## SECTION – D

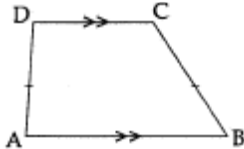
**Question number 21 to 31 carry four marks each.**

21. Find three integral solutions of  $2x + 9y + 18 = 0$ . Represent this equation by a graph. Does it pass through origin?
22. Write the equation of the lines drawn in following graph. Also, find the area enclosed between them.



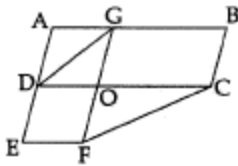
23. Medha has a plot which was of trapezium shape ABCD with  $AB \parallel DC$  and  $AD = BC$ . She decided to use this plot for “GO GREEN CAMPAIGN”. For the same, she planted trees exactly in the middle of the plot.

- How can she do that?
- What can you say about Medha’s act?

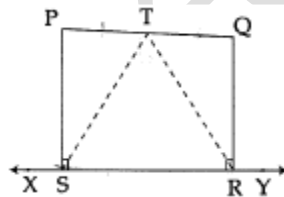


24. Draw a line segment  $AB = 10.4$  cm. Find  $\frac{3}{4}AB$  using ruler and compass.

25. In the given figure, ABCD and AGFE are parallelograms with equal areas. Show that  $DF \parallel FC$ .



26. In the given figure, P and Q are two points which lie on the same side of line XY.  $PS \perp XY$ ,  $QR \perp XY$  and T is the mid – point of line segment PQ, prove that  $TS = TR$ .



27. A pipe empties a hemispherical tank full of water at the rate of  $3\frac{4}{7}$  litres per second. How much time will it take to empty half the tank, if radius of tank is 1.5 m?

28. A metallic cone is 8.4 cm high and the radius of its base is 2.1 cm. It is melted and recasted into a sphere. Determine the radius of sphere.

29. The ratio of total surface area to the curved surface area of a right circular cylinder 3:2. Find the volume if its total surface area is  $14784$   $\text{cm}^2$ .

30. The heights of employees in an office are as follows:

Heights (in cm)	Number of employees
130 – 140	8
140 – 150	18
150 – 160	20
160 – 170	5
170 – 180	4
180 – 190	3

Draw the histogram and frequency polygon of the above table.

31. The ages of 30 teachers in a school are as follows:

Age (in years)	Number of teachers
21 – 23	3
23 – 25	4
25 – 27	5
27 – 29	6
29 – 31	5
31 – 33	4
33 – 35	3

Find the probability that the age of a teacher chosen at random:

- Lies in 29 – 35 years
- Is at least 31 years
- Is below 23 years

### SECTION – E

**32. Theme II (Adventure Camp) (1+3+4+2)**

- Which skills are developed in the adventure camp?
- Find the mean and mode of the data depicting success rate in rock climbing by Brigadier team.
- If manager served welcome drink to IX A students in cylindrical glasses and for rest of the students drink was served in hemispherical cups, find the quantity of welcome drink required in litres.
- For going to the adventure camp, if school arranged 2 mini buses of 14 seats and 1 bus of 42 seats, then what could be the seating arrangement in buses according to the criteria given in open text?