**General Instructions:**

1. All questions are compulsory.
2. The question paper consists of 31 questions divided into five sections A, B, C and 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 and Section – D comprises of 10 questions of 4 marks each. Section – E comprises of two questions of 3 marks and 1 question of 4 marks from Open Text Theme.
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. Write the equation $2x = 9$, in the standard form of a linear equation in two variables.
2. Write the linear equation representing a line which is parallel to x – axis and is at a distance of 3 units above x – axis.
3. In the figure, PQRS and AQBC are parallelograms. If $\angle S = 70^0$, find $\angle ACB$.
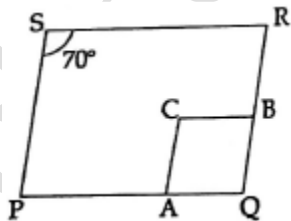
4. A cylindrical jar of volume 150 cm^3 is full of water. A solid cone is put in the cylindrical jar and some water is drained out. Find the volume of the cone if $\frac{2}{3}$ rd of the water still remains in the jar.

Section – B

Question numbers 5 to 10 carry two marks each.

5. MNOP is a parallelogram. U is any point on side OP. Show that ar(ΔMUN) = ar(ΔPUM) + ar(ΔUNO).
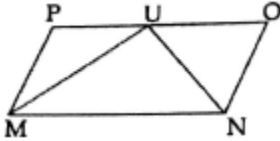
6. Draw an angle of an equilateral triangle, using protractor. Bisect it using compass.

7. PQR is a triangle. If lines drawn through P, Q and R are parallel respectively to the sides QR, PR and PQ and form ΔABC as shown in the figure, show that $PQ = \frac{1}{2} AB$.
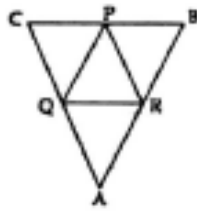

8. If the total surface area of the sphere is 5544 cm², find the diameter of the sphere.

9. The probability of guessing the correct answer to a certain question is $\frac{x}{3}$. If the probability of not guessing the correct answer is $\frac{3x}{2}$, then find the value of x.

10. In a football match, a goalkeeper of a team can stop a goal 32 times out of 40 shots by a team. Find the probability that a team can score a goal.
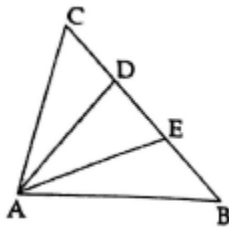
Section – C

Question numbers 11 to 18 carry three marks each.

11. In $2x + y = 13$, express y in terms of x. Also find three solutions of the above equation and draw its graph.

12. ABCD is a rectangle. Find the coordinates of its vertices. Also write the equation of its sides.
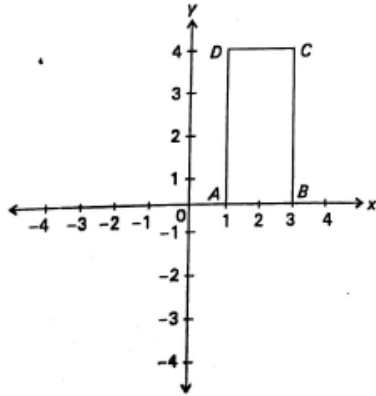
13. In ΔABC, D and E are points on side BC, such that CD = DE = EB. If ar(ΔABC) = 27 cm², find ar(ΔADE).

14. In the figure, AB and CD are two parallel chords of a circle with centre O and radius 13 cm such that AB = 10 cm and CD = 24 cm. If OP is perpendicular to AB and OQ is perpendicular to CD, determine the length of PQ.
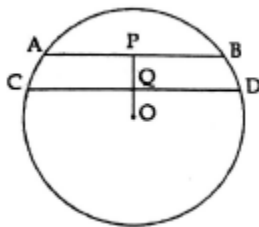

15. Construct an angle of measure $22\frac{1}{2}^0$.

16. ABCD is a rhombus whose diagonals intersect at O. E and F are mid – points of AO and BO respectively. If AC = 12 cm and BD = 16 cm, then find the length of EF.

17. Draw any acute angle. Divide it into four equal parts, using ruler and compass.

18. The surface area of the sphere of radius 5 cm is five times the curved surface area of a cone of radius 4 cm. Find the volume of the cone.

Section – D

Question numbers 19 to 28 carry four marks each.

19. In a class, number of girls is x and that of boys is y. Also, the number of girls is 6 more than the number of boys. Write the given data in the form of a linear equation in two variables. Also, represent it graphically. Find graphically the number of girls, if the number of boys is 20.

20. Write the equations of the lines drawn in the following graph. Also, find the area enclosed between them.
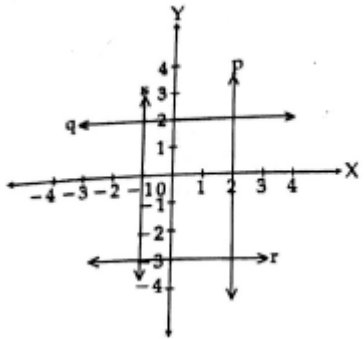
21. In a quadrilateral PQRS, diagonals PR and QS intersect each other such that ar(ΔPOS) = ar(ΔQOR). If distance between sides PQ and SR is 4 cm, PQ = 3 cm and SR = 7 cm, find ar(PQRS).
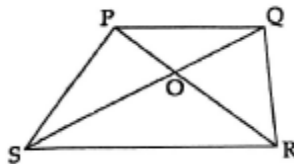
22. Q and R are the centre of two congruent circles intersecting each other at points C and D. The line joining their centres intersects the circle in points A and B such that A and B such that A and B do not lie between Q and R. If CD = 6 cm and AB = 12 cm, determine the radius of either circle and the distance between the centres of two circles.

23. Construct ΔABC if base BC = 5 cm, AB + AC = 8 cm, ∠B = 30^0.

24. ABCD is a rhombus. E, F, G and H are mid – points of the sides AB, BC, CD and AD respectively. Show that EFGH is a rectangle.

25. The 'Caring old people organisation' needs money to build the old age home which requires 164000 bricks. Bricks measure 10 cm × 8 cm × 4 cm and cost of brick depends on its volume at the rate of Rs. 1 per 100 cm^3. It requires 4 cylindrical cans of paint of radius 14 cm and height 30 cm. The

cost of paint is Rs. 1 per 20 cm^3. How much money is required by the organisation? If 'A company gives the money to organisation' then, what common value is depicted by A company and organization.

26. A metallic right circular cylinder is 15 cm high and the diameter of its base is 14 cm. It is melted and recasted into another cylinder with radius 4 cm. Find the height, curved surface area and total surface area of the new cylinder.

27. The ratio of total surface area to the curved surface area of a right circular cylinder is 3 : 2. Find the volume, if its total surface area is 14784 cm^2.

28. A tyre manufacturing company kept a record of the distance covered before a tyre was replaced.

    If you buy a tyre of this company, what is the probability that:

a. It will need a replacement after it has covered 900 km.

b. It will last more than 1200 km.

c. It will need to be replaced between 600 km to 1200 km.

d. It will need to be replaced before 600 km.

Distance	More than 1200	900 – 1200	600 – 900	300 – 600	Less than 300
No. of tyres	250	150	220	200	180

The above table shows the result of 1000 cases, use the data to answer the above questions.

Section – E

(Open Text)

(*Please ensure that open text of the given theme is supplied with this question paper.)

Theme: Childhood Obesity in India

29. If weight of a boy of 9th class is twice the weight of a girl of 9th class, then form a linear equation in two variables and plot a graph for the equation.

30. Why fasting is not good for weight loss?

31. In a survey, it was found that 60% of people come across major trouble because of obesity. Form an equation and draw the graph.