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General Instructions:

1. All the 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. Write the linear equation representing a line which is parallel to x – axis and is at a distance of 4 units below x – axis.
2. Find k, if line $kx + 3y = 5$, passes through $(1, 1)$.
3. In the given figure, O is the centre of the circle with chords AP and BP being produced to R and Q respectively. If ∠QPR = 35^0, find the measure of ∠AOB.
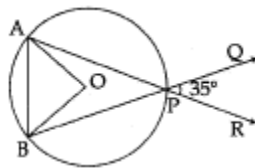

4. If surface area of a sphere is 616 cm^2, find its radius.

SECTION – B

Question numbers 5 to 10 carry two marks each.

5. The angles of a quadrilateral are $(4x)^0$, $(7x)^0$, $(15x)^0$ and $(10x)^0$. Find the smallest and the largest angles of the quadrilateral.
6. Using ruler and compass, construct ∠XYZ = 105^0.

7. In the given figure, ABCD is a cyclic quadrilateral in which AE is drawn parallel to CD and BA is produced to F. if $\angle ABC = 70^0$ and $\angle FAE = 30^0$, find $\angle BCD$.
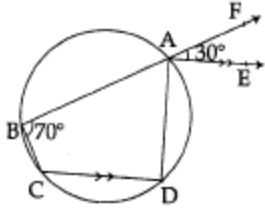

8. The volume of a right circular cylinder of base radius 10 m is 880 m^3. Find the total surface area of the cylinder.

9. A football player scored the following number of goals in 10 matches:

   1, 3, 2, 5, 8, 6, 1, 3, 7 and 9

   Find the median goals of the player.

10. In an experiment, a coin is tossed 600 times. If the tail turns up 380 times, find the experimental probability of getting:

a. A head

b. A tail

SECTION – C

Question numbers 11 to 20 carry three marks each.

11. 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 for 15 km.

12. Represent $\frac{x}{2} + y = 4$ in the form $y = mx + c$ and also draw graph of this equation.

13. ABCD is a parallelogram. T and S are the points on side DC such that DT = TS = SC and AD || TQ|| SR. Show that ar (DTX) = ar (RYB).
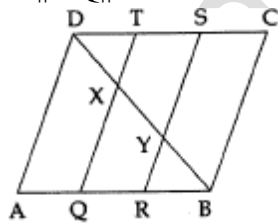
14. WXYZ is a parallelogram. E, F, G and H are respectively the mid – points of sides WX, XY, YZ and ZW. Show that ar (EFGH) = $\frac{1}{2}$ ar (WXYZ).

15. PQRS is a trapezium with PQ || SR. Side SR is produced to X such that RX = PQ. Prove that ar (PSQ) = ar (QRX)
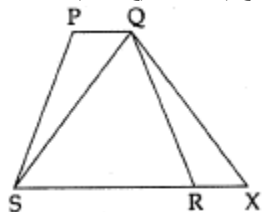
16. The lengths of two parallel chords of a circle are 6 cm and 8 cm respectively. If the smaller chord is at a distance of 4 cm from the centre, what is the distance of the other chord from the centre?

17. In triangle PQR, A and B are points on side QR such that they trisect QR. Prove that ar (PQB) = 2 ar (PBR)
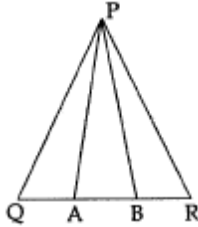
18. There is a solid cube which has been cut into two cuboids of equal volumes. Find the ratio of the total surface area of one of the cuboids to that of the given cube.

19. For the following information, construct a frequency polygon (without histogram):

| Class mark	Frequency
5	3
15	15
25	12
35	18
45	9
55	3

20. In a bottle there are 7 red buttons, 5 green buttons and 8 purple buttons. What is the probability that randomly drawn button from the bottle is a purple button? If one extra green button is put inside the bottle, what will be the probability that randomly drawn button is purple?

SECTION – D

Question numbers 21 to 31 carry four marks each.

21. A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Neeru paid Rs. 21 for a book kept for five days. Write a linear equation which satisfies the data. Draw the graph for the same.

22. Write the equations of the lines drawn in the following graph:
    Also find the area enclosed between these lines.

23. A friendly cricket match is being organized between two teams. The proceeds of this match will be given for the aid to the 'Charitable Hospital' for handicapped children. The field is circular with a ring of uniform width as shown in the figure for spectators. If O is the centre of the field and four poles are fixed at points A, B, C and D lying in straight

lines, prove that AB = CD = $\frac{1}{2}$ (AD – BC). Which value is promoted through this question?
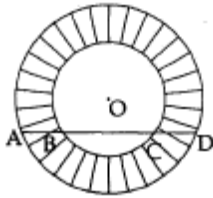
24. Construct a triangle AJK in which JK = 7.5 cm, $\angle J = 40^0$ and AJ – AK = 1.7 cm.
25. In the given figure, ABCD is a parallelogram. X, Y, L and M are mid – points of AB, DC, AD and BC respectively. XY and LM intersect at O. Show that AXOL is a parallelogram.
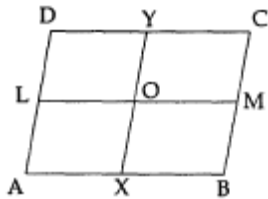
26. In the given figure, O is the centre and AE is a diameter of the semicircle ABCDE. If AB = BC and $\angle AEC = 60^0$, then find:

a. $\angle CBE$ b. $\angle CDE$ c. $\angle AOB$

Also, prove that BO || CE.
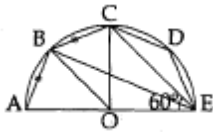
27. A semicircular sheet of metal of radius 14 cm is bent to form an open conical cup. Find the capacity of the cup.
28. A hemispherical bowl of internal radius 9 cm is full of water. This rose water is to be filled in cylindrical bottles of diameter 9 cm and height 4 cm. Find the number of bottles needed to empty the rose water of the bowl. (Take $\pi = \frac{22}{7}$)
29. Curved surface of cylindrical reservoir 12 m deep is plastered from inside with concrete mixture at the rate of Rs. 15 per m^2. If the total payment made is of Rs. 5652, then find the capacity of this reservoir in litres.
30. The distances (in km) of 40 teachers from their residence to the school are given below:
5, 19, 7, 12, 3, 10, 9, 14, 10, 12, 7, 2, 20, 17, 8, 9, 15, 18, 3, 6, 11, 11, 5, 15, 15, 12, 12, 15, 7, 17, 15, 7, 12, 16, 18, 6, 20, 2, 3, 2
Find the probability that a teacher selected at random,

a. Lives in less than 7 km from her school.
b. Lives at most 15 km from her school.
c. Lives within 1 km from her school.

31. Draw a frequency polygon for the following data:

Class	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25
Frequency	16	40	32	24	8

SECTION – E

32. Theme – I (Planning a garden)   **(3 + 2 + 3 + 2)**

a. From the list of herbs given with their height, find the probability of randomly selecting a plant having height
(i)   Almost 1 foot.
(ii)   More than 1 foot.
b. An iron grill is to be put up all along the boundary (except there where is a wall) with one gate which is 4 feet wide at one side. What is the length of the grill?
c. How much compost fertilizer is required to mix with garden soil for preparation of ground excluding the area of paths?
d. Find cost of compost fertilizer to mix with the soil.