Self Assessment Paper

5

Section 'A'

Questions 1 to 10 carry 1 mark each. Each question has four alternate answers of which only one is correct. Choose the correct answer.

1. $\sqrt{10} \times \sqrt{15}$ is equal to

   (a) $6\sqrt{5}$ (b) $5\sqrt{6}$

   (c) $\sqrt{25}$ (d) $10\sqrt{5}$

   OR

   The number $\sqrt{45}$ is
   (a) a rational number   (b) an irrational number
   (c) a prime number   (d) Nine of these

AI 2. Which of the following is a factor of $(x + y)^3 - (x^3 + y^3)$?
   (a) $x^2 + y^2 + 2xy$ (b) $x^2 + y^2 - xy$
   (c) xy^2 (d) $3xy$

   OR

   If $a + b + c = 0$, then $a^3 + b^3 + c^3$ is equal to
   (a) 0 (b) abc
   (c) $3abc$ (d) $2abc$

3. A point both of whose coordinates are negative will lie in
   (a) I quadrant.   (b) II quadrant.
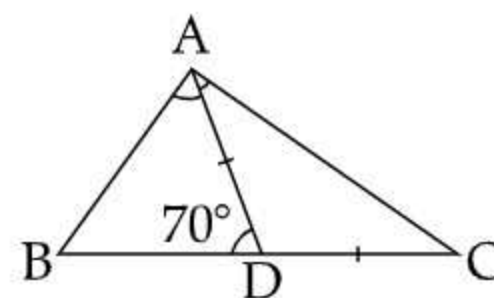   (c) III quadrant.   (d) IV quadrant.

4. The equation of a line passing through the origin is of the form
   (a) $y = kx$ (b) $x + y = k$
   (c) $x - y = k$ (d) None of these
   (where k is a constant)

5. In the $\triangle ABC$, AD bisects $\angle BAC$ and AD = DC. If $\angle BDA = 70°$, then the measure of $\angle ACD$ is
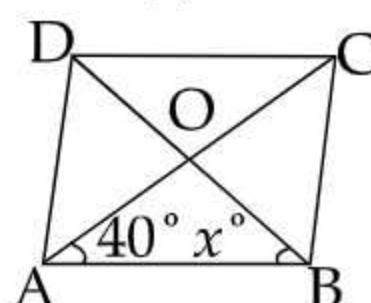   (a) $35°$ (b) $40°$
   (c) $45°$ (d) $50°$

6. In fig. ,ABCD is a rhombus whose diagonals intersect at O.
   If $\angle OAB = 40°$ and $\angle ABO = x°$, then $x =$
   (a) $50°$ (b) $35°$
   (c) $40°$ (d) $45°$

7. A cylinder has a diameter of 14 cm and the area of its curved surface is 220 sq. cm. Then, the volume of the cylinder is

   (a) 770 cm³   (b) 1000 cm³
   (c) 1540 cm³   (d) 6622 cm³

8. A and B are the only two outcomes of an event and P(A) = 0.32, then the value of P(B) would be

   (a) 0.38   (b) 0.68
   (c) 0.78   (d) 0.32

OR

Two coins are tossed 1000 times and the outcomes are recorded as below

Number of heads	2	1	0
Frequency	200	550	250

Based on this information, the probability for atmost one head is

(a) $\dfrac{1}{5}$ (b) $\dfrac{1}{4}$

(c) $\dfrac{4}{5}$ (d) $\dfrac{3}{4}$

9. The two parallel sides of a trapezium are 1 m and 2 m respectively and the perpendicular distance between them is 6 m. Then, the area of the trapezium is

   (a) 18 m²   (b) 12 m²
   (c) 9 m²   (d) 6 m²

10. If an equilateral ∆ABC is inscribed in a circle with centre O, then ∠BOC is

    (a) 30°   (b) 60°
    (c) 90°   (d) 120°
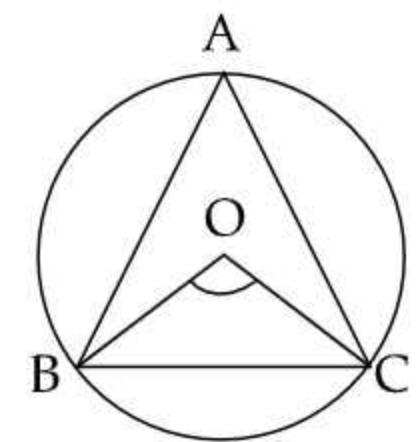
Questions 11 to 15 : State true or false

[AI] 11. The product of non-zero rational number and an irrational number can be rational.

12. The diagonals of a parallelogram are equal.

OR

Sum of interior angles of a polygon having *n* sides is (*n* – 2) right angles

13. The base and the corresponding altitude of a parallelogram are 10 cm and 3.5 cm, respectively. The area of the parallelogram is 30 cm².

14. The Euclidean geometry is valid only for figures in the plane.

[AI] 15. PQRS is a parallelogram whose area is 180 cm² and A is any point on the diagonal QS. The area of ∆ASR = 90 cm².
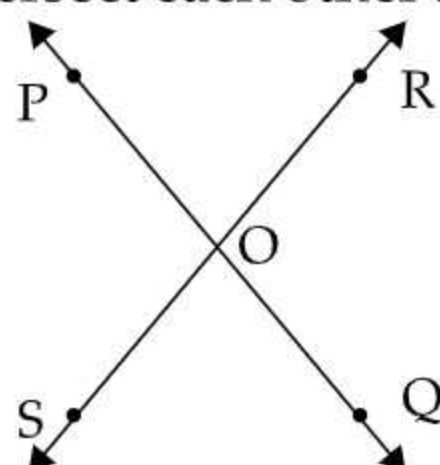
Questions 16 to 20 carry 1 mark each

16. If –4 is a zero of the polynomial

    $p(x) = x^2 + 11x + k$, then calculate the value of k.

OR

If $f(x) = 2 + \dfrac{x}{2} + x^2 - \dfrac{x^3}{3}$, find $P(-1)$

17. In the figure, two lines PQ and RS intersect each other at O. Name pairs of vertically opposite angles.

18. The floor of a rectangular hall has a perimeter 250 m and height 6 m. Find the area of 4 walls.

OR

There are two cones. The curved surface area of one is twice that of the other. The slant height of the later is twice that of former. Find the ratio of their radii.

19. In an equilateral triangle ABC, D and E are the mid-points of sides AB and AC respectively, then length of DE is ....
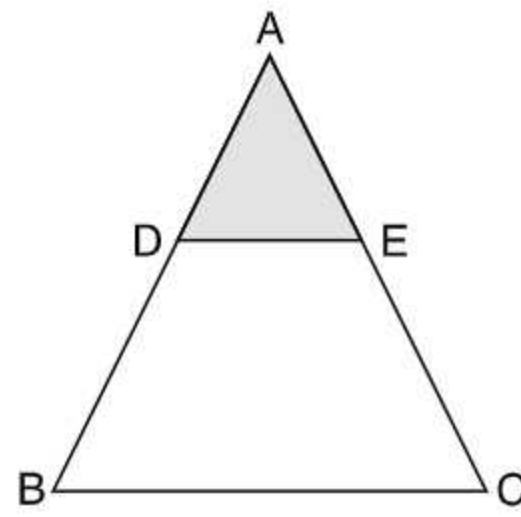
20. Write the name of formula for finding the area of an acute angle triangle when sides are given.

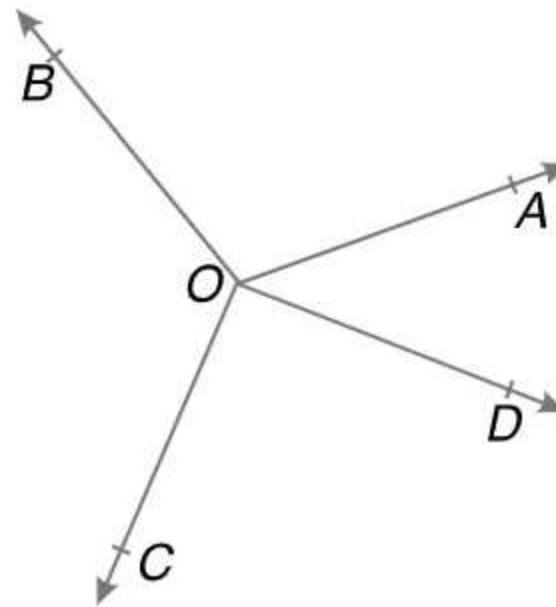## Section 'B'

Questions number 21 to 26 carry 2 marks each.

21. Find the product of $5\sqrt{2}\left(3+\sqrt{2}\right)\left(5+\sqrt{2}\right)$.

OR

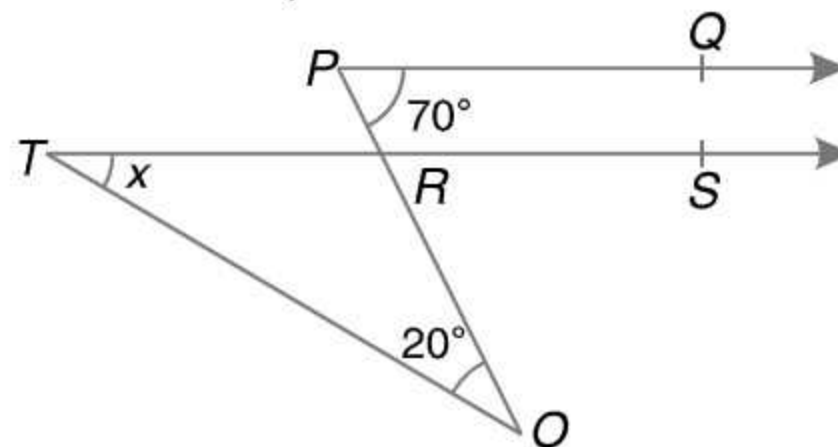Find the value of $(1^3 + 2^3 + 3^3)^{-3/2}$

22. It is known that $x + y = 20$ and that $x = z$. Show that $z + y = 20$?

23. In the given figure, prove that $\angle AOB + \angle BOC + \angle COD + \angle DOA = 360°$.

OR

In fig., $PQ \parallel RS$, $\angle QPR = 70°$, $\angle ROT = 20°$, find the value of x.

24. ABC is an isosceles triangle with $AB = AC$. Draw $AP \perp BC$. Show that $\angle B = \angle C$.

25. An isosceles right triangle has area 200 cm^2. Find the length of its hypotenuse.

26. The mean of 100 observations is 60. If one observation of 50 is replaced by 110, then what will be the new mean ?
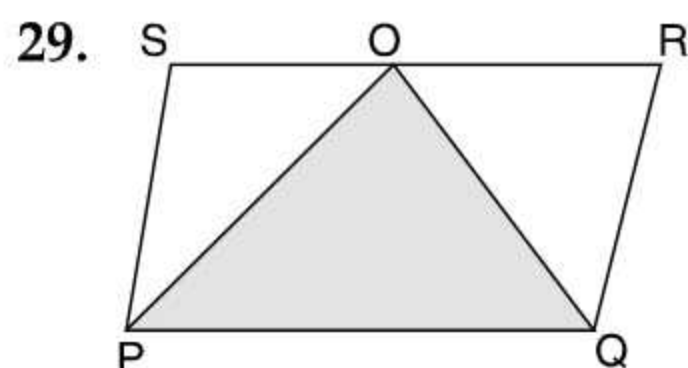
Questions 27 to 34 carry 3 marks each

[AI] 27. Simplify : $(2a + 3b)^3 - (2a - 3b)^3$

<center>**OR**</center>

if $x = 2 + \sqrt{5}$, then find the value of $(x - \dfrac{1}{x})^3$

28. A triangle has sides 5 cm and 12 cm. Find the length, to one decimal place, of the perpendicular from the opposite vertex to the side whose length is 13 cm.

29.

In a parallelogram $PQRS$ of the given figure, the bisectors of $\angle P$ and $\angle Q$ meet SR at O. Show that $\angle POQ = 90°$.

[AI] 30. Draw the graphs of y = x + 1 and x + y = 5 on the same cartesian plane. Shade the triangle formed by these graphs and y-axis and also find its area.

31. $PQRS$ is a trapezium with $PQ \parallel SR$. Side SR is produced to X such that $RX = PQ$. Prove that ar $(\Delta PSQ) = $ ar(ΔQRX).
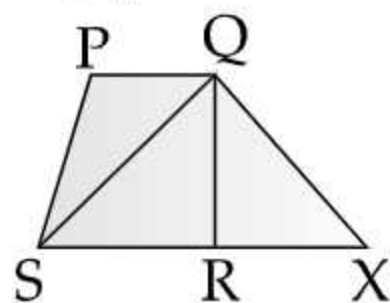
<center>**OR**</center>

In the given figure, $PQRST$ is a pentagon. TX is drawn parallel to SP which meets PQ produced at X. RY drawn parallel to SQ which meets PQ produced at Y. Show that ar $(PQRST) = ar$ (ΔSXY).
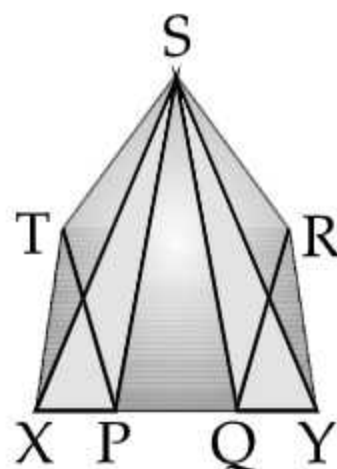
[II] 32. If two equal chords of a circle intersect within a circle, prove that the line segment joining the point of intersection to the centre makes equal angles with the chords.

33. Plot the points (x, y) given in the following table on the cartesian plane, choosing suitable units of distance on the axes.

x	− 1.25	0	3	− 1.75	4	− 2.25
y	2	2.25	1.5	− 2	− 3	0

34. A coin is tossed for a certain number of times. If the probability of getting a head is 0.4 and head appears for 24 times, find the number of times, the coin was tossed. Hence, find probability of getting a tail and verify that P(H) + P(T) = 1.

<center>**OR**</center>

The Following distribution gives the weight of 38 students of a class :

Weight in kg.	Number of students
31 – 35	9
36 – 40	5
41 – 45	14
46 – 50	3
51 – 55	1
56 – 60	2
61 – 65	2
66 – 70	1
71 – 85	1

Find the probability that weight of a student in the class is :
(i) at most 60 kg,
(ii) at least 36 kg,
(iii) not more than 50 kg.

Section 'D'

Questions 35 to 40 carry 4 marks each

35. If $x = \dfrac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ and $y = \dfrac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$, then find

    The value of $x^2 + y^2$.

AI 36. Prove that $2x^3 + 2y^3 + 2z^3 - 6xyz = (x + y + z)[(x - y)^2 + (y - z)^2 + (z - x)^2]$.

    Hence evaluate : $2(13)^3 + 2(14)^3 + 2(15)^3 - 6 \times 13 \times 14 \times 15$.

    (OR)

    Using factor theorem, factorize $x^3 - 2x^2 - 5x + 6$.

37. Draw the graph of the following equation on the same graph sheet : $x - y = 0, x + y = 0, y + 5 = 0$.

    Also find area enclosed between these lines.

AI 38. Draw a histogram to represent the following grouped frequency.

Age (in years)	5-9	10-14	15-19	20-24	25-29	30- 34	35- 39
No. of persons	10	28	32	48	50	35	12

Also draw frequency polygon.

39. Construct a triangle ABC in which BC = 7 cm, $\angle B = 75°$ and AB + AC = 13 cm.

AI 40. A cube and cuboid have the same volume. The dimensions of the cuboid are in the ratio of 1 : 2 : 4. If the difference between the cost of polishing the cuboid and the cube at the rate of ₹5 per m² is ₹80, find the edge of the cube.

OR

The cost of papering the walls of the room 12 m long at the rate of ₹ 1.35 per m² is ₹ 340.20 and the cost of matting the floor at the rate of 85 paise per m² is ₹ 91.50. Find the height of the room.