SA - II

BLUE PRINT - II

Topic/Type	*MCQ 1 Mark*	*SA (I) 2 Mark*	*SA (II) 3 Mark*	*LA 4 Marks*	*Total*
Algebra	3 (3)	2 (4)	3 (9)	1 (4)	9 (20)
Geometry	1 (1)	2 (4)	2 (6)	1 (4)	7 (16)
Mensuration	1 (1)	1 (2)	2 (6)	3 (12)	6 (20)
Some Application of Tegumentary	2 (2)	1 (2)	–	1 (4)	4 (8)
Coordinate Geometry	2 (2)	1 (2)	2 (6)	–	5 (12)
Probability	1 (1)	1 (2)	1 (3)	–	3 (6)
Total	10 (10)	8 (16)	10 (30)	6 (24)	34 (80)

Note : Marks are within brackets.

SAMPLE QUESTION PAPER

MATHEMATICS (SA - II)

Time allowed : 3 to 3½ hours ***Maximum Marks : 80***

General Instructions

1. All questions are compulsory.
2. The question paper consists of 34 questions divided into four sections A, B, C and D. Section A comprises of 10 questions of 1 mark each. Section B comprises of 8 questions of 2 marks each. Section C comprises of 10 questions of 3 marks each and Section D comprises of 6 questions of 4 marks each.
3. Question numbers 1 to 10 in Section A are multiple choice questions where you are to select one correct option out of the given four.
4. There is no overall choice. How ever, internal choice has been provided in 1 question of 2 marks 3 questions of three marks each and 2 questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
5. Use of calculators is not permitted.

SECTION A

Question number 1 to 10 are of 1 mark each

1. The sum of roots of the quadratic equation $2x^2 + 13x + 11 = 0$ is

   (a) -13 (b) $-\frac{13}{2}$

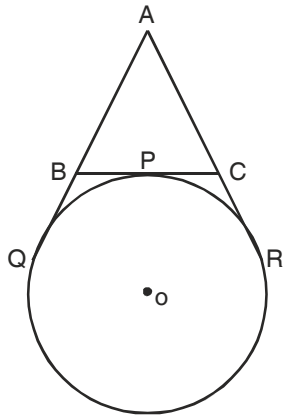
   (c) $\frac{11}{2}$ (d) -11

2. n^{th} term of the A.P. $-5, -3, -1, \ldots\ldots$ is

   (a) $2n - 7$ (b) $7 - 2n$

   (c) $2n + 7$ (d) $2n + 1$

3. In the given fig. *P, Q* and *R* are the points of contact. If *AB* = 6 cm, *BP* = 3 cm, then the perimeter of ΔABC is



(a) 12 cm (b) 18 cm

(c) 9 cm (d) 15 cm

4. The tops of the two poles of height 8 m and 12 m are connected with wire. If wire makes an angle 30° with the horizontal, then the length of wire is–

(a) 10 m (b) 12 m

(c) 8 m (d) 4 m

5. The distance between the line $y + 3 = 0$ and $2y - 5 = 0$ is–

(a) 8 unit (b) $\frac{11}{2}$ unit

(c) 6 unit (d) 5 unit

6. The probability of a question calculated to be right is $\frac{x}{12}$. If the probability of the question calculated not to be right is $\frac{2}{3}$ then x = ...

(a) 2 (b) 3

(c) 4 (d) 6

7. If –9, –14, –19, ... is an A.P. then the value of $a_{30} - a_{20}$ is

(a) –50 (b) 50

(c) 10 (d) None of these

8. A right circular cylinder of height 45 cm and radius 4 cm is made by melting of spheres of radius 6 cm each. Find the number of spheres.

(a) 3 (b) 4

(c) 5 (d) 6

9. At any instant, the shadow of a pole is equal to its height, the angle of elevation of the sum is

(a) 30° (b) 45°

(c) 60° (d) 90°

10. The perimeter of triangle formed by the points (0, 0), (3, 0) and (0, 3) is

(a) 6 unit (b) 9 unit

(c) $2\left(1+\sqrt{3}\right)$ unit (d) $3\left(2+\sqrt{2}\right)$ unit

SECTION B

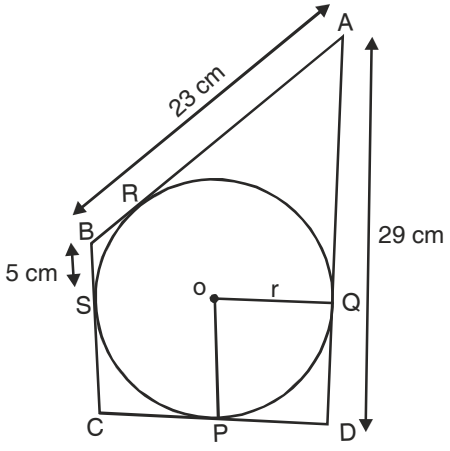
11. If the third term of an A.P. is 1 and 6^{th} term is –11 then find its 15^{th} term.

12. For what value of '*m*' the roots of the quadratic equation : $4x^2 + mx + 1 = 0$ are real?

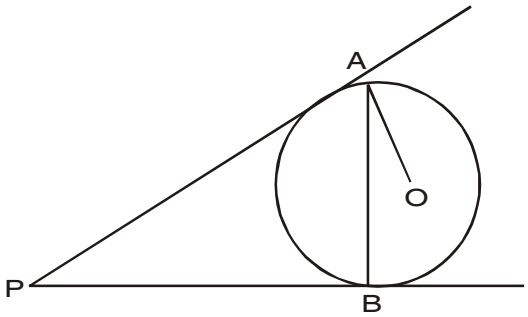
13. Two concentric circles are of radii 5 cm and 3 cm. Find the length of chord of the larger circle which touches the smaller circle.

OR

In given Fig. find the radius of the circle.



14. Two tangents PA and PB are drawn to a circle with centre O from an external point P. Prove that $\angle APB = \angle OAB$



15. Three balls are made by melting a ball of radius 3 cm out of these three the radius of two balls are 1.5 cm and 2 cm respectively. Find the radius of third ball.

16. The angle of elevation of the top of a tower from two points at a distance of 4 m and 9 m from the base and on the same straight line with it are complementary. Find the height of the tower.

17. Find a point on *y*-axis which is equidistant from the points (–2, 5) and (2, –3).

18. All kings, queens and jacks have been removed from a pack of cards and remaining cards are well shuffled. A card is drawn at random. Find the probability that it is–

    (a) A face card. (b) A black card.

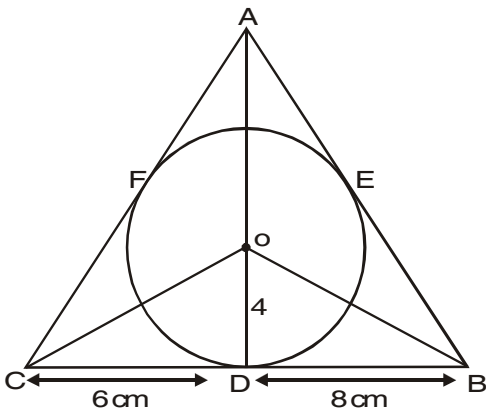
SECTION C

19. Construct an isosceles triangle whose base is 8 cm and altitude 5 cm and then construct another triangle whose sides are $\frac{3}{4}$ times the corresponding sides of the given triangle.

20. Solve the equation

$$2\left(\frac{x-1}{x+3}\right) - 7\left(\frac{x+3}{x-1}\right) = 5 \quad (\text{for } x \neq -3,\ x \neq 1)$$

21. In given fig. a ΔABC is drawn to circumscribe a circle of radius 4 cm. *D*, *E* and *F* are points of contact. Find the sides *AB* and *AC.*



22. A copper of 2.2 dcm^3 is melted and recast into a wire of diameter .50 cm. Find the length of wire.

OR

Find the area swept by a minute hand of length 14 cm in one minute.

23. In an AP, the 1st term is –4, the last term is 29 and sum of all terms is 150, find the common difference.

24. How many terms lie between 10 and 300, which when divided by 4 leaves a remainder 3.

OR

If n^{th} term of an A.P. is $3–2n$, then find the sum of its 40 terms.

25. The slant height of right circular cone is 10cm and its height is 8 cm. It is cut by a plane parallel to its base passing through the mid point of the height find ratio of the volume of two parts.

26. In right angled ΔABC, $\angle B = 90°$ and $AB = \sqrt{34}$ unit. The coordinates of points B and C are (4, 2) and (–1, y) respectively. If $ar\ (\Delta ABC) = 17$ sq. unit, then find the value of y.

27. A number 'x' is selected from the numbers 1, 2, 3 and the another number 'y' is selected from the numbers 1, 4, 9 what is the probability that the product of both is less than 9.

OR

A bag contains 12 balls out of which x are black. If 6 more black balls are put in the box, the probability of drawing a black ball is double of what it was before. Find x.

28. If the points (x, y), $(-5, -2)$ and $(3, -5)$ are collinear prove that $3x + 8y + 31 = 0$.

SECTION D

29. Two pipes together can fill a tank in 6 minutes. One of the pipes alone can fill the tank by taking 5 minutes more than the other. Find the time in which each pipe alone can fill the tank.

OR

A train covers a distance of 90 km at a uniform speed. Had the speed been 15 km/hr more, it would have taken half an hour less the journey. Final original speed of train.

30. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

31. From solid cylinder of height 28cm and radius 12cm, a conical cavity of height 16cm, and radius 12cm, is drilled out. Find (a) the volume (b) total surface area of remaining solid.

32. A container, shaped like a right circular cylinder, having diameter 12cm and height 15 cm is full of ice-cream. This ice-cream is to be filled in to cones of height 12cm and diameter 6cm, having a hemispherical shape on the top, find the number of such cones which can be filled with ice-cream.

33. From a point on the ground, the angle of elevation of the bottom and top of a transmission tower fixed at the top of 20m high building are 45° and 60° respectively. Find the height of the transmission tower.

34. A hemispherical bowl of internal diameter 36 cm is full of liquid. Thus liquid is to be filled in cylindrical bottles of radius 3 cm and height 65 cm. How many bottles are required to empty the bowl?

OR

The inner circumference of a circular track is 440 cm. The track is 14 cm wide. Find the cost of levelling it at 20 paise/sqm. Also find the cost of putting up a fence along outer circle at Rs. 2 per metre.

ANSWERS

1. *b*
2. *a*
3. *b*
4. *c*
5. *b*
6. *c*
7. *a*
8. *c*
9. *b*
10. *d*
11. –47
12. $m \geq 4$ or $m \leq -4$
13. 8 cm or $\frac{11}{2}$ cm
15. 5 cm
16. 6 *m*
17. (0, 1)
18. (a) 0, (b) $\frac{1}{2}$
20. $-\frac{23}{5}, -1$
21. $AB = 15$ cm, $AC = 13$ cm
22. 112 m or 10.26 cm^2
23. d = 3
24. 73
25. 8 : 7
26. $y = -1, 5$
27. $\frac{5}{9}$ OR 3.
29. 10 min, 15 min or 45 km/hr
31. $10258\frac{2}{7}\ cm^3$, $3318\frac{6}{7}\ cm^2$
32. 10
33. $33\left(20\sqrt{3} - 1\right)$ m.
34. 72 OR Rs. 1355.20, Rs. 1056