2S04106677

15E & 16E

Total No. of Printed Pages : 7

Question Booklet Sl. No.
3917821

MATHEMATICS
(English Version)

Time : 3 Hours 15 Minutes

Max. Marks : 100

Instructions :

1) In the duration of **3** hours **15** minutes, **15** minutes of time is allotted to read the question paper.
2) **All** the answers shall be written in the answer booklet only.
3) Question paper consists of **4** Sections and **33** questions.
4) **Internal** choice is available in Section – **IV only**.
5) Answers shall be written **neatly** and **legibly**.

SECTION – I

(12×1=12)

Note : 1) Answer **all** the questions in **one** word or **a** phrase.
2) **Each** question carries **1** mark.

1. If HCF (26, 91) is 13, then find LCM of (26, 91).

2. Write an example for trinomial having degree 6.

3. If P(E) the probability of an event "E", then

A) $P(E) \geq 1$

B) $P(E) \leq 0$

C) $0 \leq P(E) \leq 1$

D) $P(E) \leq 1$

4. Define tangent to a circle.

5. An observer 1.5 m tall is 28.5 m away from a tower of height 30 m. Find the angle of elevation of the top of tower from her eyes.

6. Match the following :

i. $\sin 90° \times \cos 90°$	p. 2
ii. $\cos\theta \times \sec\theta$	q. 0
iii. If $\operatorname{cosec}\theta + \cot\theta = \frac{1}{2}$, then $\operatorname{cosec}\theta - \cot\theta$	r. 1

Choose the correct answer :

A) i → r, ii → p, iii → q

B) i → r, ii → q, iii → p

C) i → p, ii → q, iii → r

D) i → q, ii → r, iii → p

7. Draw the rough figure of the toy which is in the form of a cone mounted on a hemisphere of same radius.

8. **Statement I** : Any two circles are similar.

Statement II : Any two equilateral triangles are similar.

Choose the correct option from the following.

A) Statement I is true and statement II is false

B) Statement I is false and statement II is true

C) Both statements are true

D) Both statements are false

9. **Assertion** : The pair of linear equations $2x + 3y + 6 = 0$ and $4x + 6y + 7 = 0$ have no solution.
Reason : $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ so, the linear equations are parallel and there is no possible solution.

Choose the correct option from the following.

A) Both Assertion and Reason are true, Reason is supporting the Assertion

B) Both Assertion and Reason are true, but Reason is not supporting the Assertion

C) Assertion is false, but Reason is true

D) Assertion is true, but the Reason is false

10. The quadratic polynomial whose sum of zeroes is –3 and product of zeroes is 2 is

A) $x^2 + 3x + 2$

B) $x^2 - 3x + 2$

C) $x^2 - 3x - 2$

D) $x^2 + 3x - 2$

11. If one root of the quadratic equation $x^2 - 7x + 12 = 0$ is 4, then find the other root.

12. What is the common difference in an A.P. if the first term is 6 and the n^{th} term is 6n ?

A) 4

B) 5

C) 6

D) 0

SECTION – II

(8×2=16)

Note : 1) Answer **all** the questions.

2) **Each** question carries **2** marks.

13. Express $(\text{cosec}\theta - \cot\theta)^2$ in terms of $\cos\theta$.

14. Find the distance between $(a\cos\theta, 0)$ and $(0, a\sin\theta)$.

15. Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$.

16. 2 cubes each of volume 64 cm^3 are joined end to end. Find the total surface area of the resulting cuboid.

17. Check whether the following is a quadratic equation or not ?
$(2x - 1)(x - 3) = (x + 5)(x - 1)$.

18. A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that OQ = 12 cm. Find the length of tangent PQ.

19. Define similar triangles.

20. A player sitting on the top of a tower of height 20 m observes the angle of depression of a ball lying on the ground as 60°. Draw a rough diagram for this situation.

SECTION – III

(8×4=32)

Note : 1) Answer **all** the questions.
2) **Each** question carries **4** marks.

21. Two dice, one blue and one grey are thrown at the same time. What is the probability that the sum of the two numbers appearing on their tops is ?
i) 6
ii) 12
iii) 9
iv) 13

22. Write the formula to find the median of a grouped data and explain the terms involved in it.

23. A pen stand made of wood is in the shape of a cuboid with four conical depressions to hold pens. The dimensions of the cuboid are 15 cm by 10 cm by 3.5 cm. The radius of each of the depressions is 0.5 cm and the depth is 1.4 cm. Find the volume of wood in the entire stand.

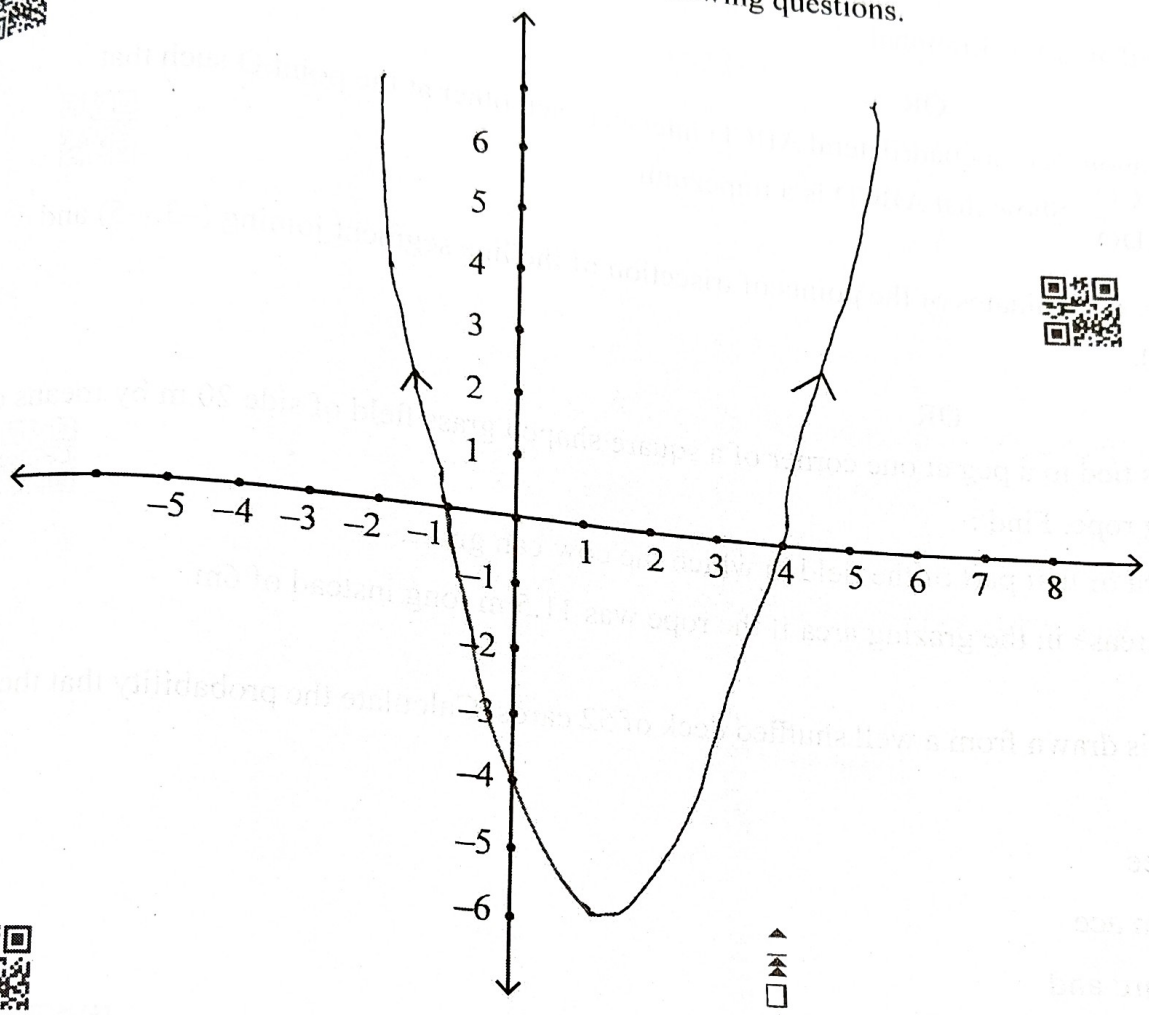
24. Find the value of k for the quadratic equation $kx(x - 2) + 6 = 0$, so that it has two equal real roots.

25. Prove that $\sqrt{\frac{1-\sin A}{1+\sin A}} = \sec A - \tan A$.

26. How many two digit numbers are divisible by 3 ?

27. Prove that the lengths of tangents drawn from external point to a circle are equal.

28. Observe the following graph and answer the following questions.



a) Name the shape of graph.

b) How many zeroes of the polynomial are there in the graph ?

c) What are the zeroes of the polynomial in the graph ?

d) Write the sum of zeroes.

P.T.O.

SECTION – IV

(5×8=40)

Note : 1) Answer **all** the questions.

2) **Each** question carries **8** marks.

3) There is an **internal** choice for **each** question.

29. a) Prove that $\sqrt{7}$ is irrational.

OR

b) The diagonals of a quadrilateral ABCD intersect each other at the point O such that $\frac{AO}{BO} = \frac{CO}{DO}$. Show that ABCD is a trapezium.

30. a) Find the co-ordinates of the points of trisection of the line segment joining (–3, –5) and (–6, –8).

OR

b) A cow is tied to a peg at one corner of a square shaped grass field of side 20 m by means of 6 m long rope. Find :

i) the area of that part of the field in which the cow can graze.

ii) the increase in the grazing area if the rope was 11.5 m long instead of 6m.

31. a) One card is drawn from a well shuffled deck of 52 cards. Calculate the probability that the card will

i) be an ace

ii) not be an ace

iii) a face card and

iv) a spade.

OR

b) A contractor plans to install two slides for the children to play in a park. For the children below the age of 5 years, she prefers to have a slide whose top is at a height of 1.5 m, and is inclined at an angle of 30° to the ground, whereas for elder children, she wants to have a steep slide at a height of 3 m and inclined at an angle of 60° to the ground. What should be the length of the slide in each case ?

32. a) Find the mean for the following data (Using step deviation method).

Class :	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency :	8	16	36	34	6

OR

b) Find the sum of first 51 terms of an A.P. whose second and third terms are 14 and 18 respectively.

33. a) Solve the following pair of linear equations graphically :

$2x + y - 6 = 0$

$4x - 2y - 4 = 0.$

OR

b) Form the pair of linear equations in the following situation and find their solution graphically.

Lata bought two pencils and three chocolates for ₹ 9 and Suma bought one pencil and two chocolates for ₹ 5. Find the price of one pencil and that of one chocolate.