

MATHEMATICS, Paper-I & II
(English Version)

Time : 3 Hours, 15 Minutes

Maximum 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** 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.
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SECTION I

12 × 1 = 12

- Notes :**
1. Answer **all** the questions in One Word or Phrase.
 2. Each question carries **1** mark.

1. "The cost of 2 pens and 5 pencils is Rs. 20". Express this data as a linear equation.
2. Choose the correct answer satisfying the following statements.
Statement (A) : Number of maximum zeroes of a cubic polynomial is 3.
Statement (B) : Zero of a linear polynomial $x - 2$ is -2 .
 - i) Both (A) and (B) are TRUE.
 - ii) (A) is TRUE, (B) is FALSE
 - iii) (A) is FALSE, (B) is TRUE.
 - iv) Both (A) and (B) are FALSE.

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3. Find the value of $\text{Log}_6 36$.
4. Find the discriminant of quadratic equation $x^2 - 5x + 6 = 0$.
5. Find the volume of a cylinder whose base radius is 3 cm and height is 7 cm.
6. If $n(A) = 10$, $n(B) = 6$ and $n(A \cup B) = 12$, then $n(A \cap B) = \dots\dots\dots$
7. Give two different examples of pair of similar figures.
8. Match the following :

A) $\text{Tan}\theta$	i) $\frac{\text{Cos}\theta}{\text{Sin}\theta}$
B) $\text{Cot}\theta$	ii) $\sqrt{1 + \text{Cot}^2\theta}$
C) $\text{Cosec}\theta$	iii) $\sqrt{\text{Sec}^2\theta - 1}$

- a) $A \rightarrow \text{(i)}$, $B \rightarrow \text{(ii)}$, $C \rightarrow \text{(iii)}$
- b) $A \rightarrow \text{(ii)}$, $B \rightarrow \text{(iii)}$, $C \rightarrow \text{(i)}$
- c) $A \rightarrow \text{(iii)}$, $B \rightarrow \text{(i)}$, $C \rightarrow \text{(ii)}$
- d) $A \rightarrow \text{(ii)}$, $B \rightarrow \text{(i)}$, $C \rightarrow \text{(iii)}$

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9. Midpoint of a line joining the two points $(0, 0)$ and $(4, 6)$ is
10. Draw a rough diagram to the given situation.
"A person observed a top of a tree 10 m. away from its foot at the angle of elevation is 45° ."
11. Assertion : Mode of $\sin 0^\circ, \cos 0^\circ, \sin 90^\circ$ and $\tan 45^\circ$ is 0
Reason : $\bar{x} = \frac{\sum f_i x_i}{\sum f}$
Choose the correct answer
- 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 true but the Reason is false.
 - D) Assertion is false but the Reason is true.
12. The number of common tangents can be drawn to two concentric circles is

SECTION II

$8 \times 2 = 16$

Notes : 1. Answer **all** the questions.

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

13. If $x + 2y = 7$ and $4x - ay = 10$ has no solution, then find the value of ' a '.
14. In a construction of kitchen shed at school, a truck unloaded the sand which was formed in the shape of a cone. The base radius of the cone is 2.7 m. and its height is 7 m. Find the volume of sand unloaded there.

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15. Express the following sets in set-builder form :

i) $A = \{1, 8, 27, 64\}$

ii) $B = \{-3, -2, -1, 0, 1, 2\}$

16. Find the HCF of 220 and 40 by using Euclid Division Lemma.

17. Draw a circle and two lines parallel to a given line such that one is a tangent and the other is a secant to the circle.

18. If $\tan\theta = \frac{7}{24}$, then find the value of $\sec\theta$.

19. Write the formula to find mean of grouped data in direct method and explain the terms in it.

20. Show that the centroid of a triangle formed by the vertices $(0, 0)$, $(2, 0)$ and $(1, 3)$ is $(1, 1)$.

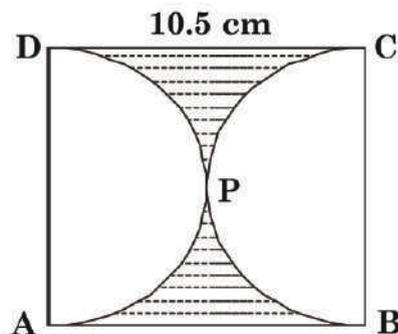
SECTION III

 $8 \times 4 = 32$

Notes : 1. Answer **all** the questions.

2. Each question carries **4** marks.

21. Find the zeroes of the polynomial $x^2 + 7x + 10$ and verify the relation between the co-efficients of the polynomial and the zeroes of the polynomial
22. Kavitha went to a bank to withdraw Rs. 8,000. She asked the cashier to give the cash in Rs. 100 and Rs. 500 notes only. She got 32 notes in all. Can you tell how many notes each of Rs. 100 and Rs. 500 she received?
23. If $A = \{x : x \text{ is a factor of } 6\}$,
 $B = \{x : x \text{ is a positive even number less than } 10\}$,
 then find (i) $A \cup B$, (ii) $A \cap B$, (iii) $A - B$ by Venn diagram.
24. If the Geometric Progressions 162, 54, 18, and $\frac{2}{81}, \frac{2}{27}, \frac{2}{9}, \dots$ have their n^{th} terms equal, then find the value of ' n '.
25. Find the area of shaded region in figure, if $ABCD$ is a square of side 10.5 cm and APD, BPC are semicircles (Use $\pi = \frac{22}{7}$).



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26. Express the following in terms of trigonometric ratios of angles between 0° and 45° .

i) $\sin 81^\circ + \tan 75^\circ$ ii) $\cos 65^\circ + \cot 75^\circ$

27. When a die is thrown once, find the probability of getting on its face :

- i) 8
- ii) a number less than 6
- iii) a prime number
- iv) a composite number

28. $ABCD$ is a trapezium in which $AB \parallel DC$ and its diagonals intersect each other at the point ' O '. Show that $\frac{AO}{BO} = \frac{CO}{DO}$.

SECTION IV

5 × 8 = 40

- Notes :**
- 1. Answer **all** the questions.
 - 2. Each question carries **8** marks.
 - 3. Each question has internal choice.

29. a) Prove that $\sqrt{2} + \sqrt{5}$ is irrational.

OR

b) Check whether - 150 a term of the AP : 11, 8, 5, 2,

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30. a) Find the roots of the quadratic equation $x^2 + 3x - 18 = 0$ by the method of completing the square.

OR

- b) Two cubes each of volume 64 cm^3 are joined end to end together. Find the lateral surface area and total surface area of resulting Cuboid.
31. a) Find the area of the quadrilateral whose vertices taken in order are $A(1,1)$, $B(7, -3)$, $C(12,2)$, $D(7,21)$.

OR

- b) If the median of 60 observations given below is 28.5, then find the values of x and y .

Class interval	0–10	10–20	20–30	30–40	40–50	50–60
Frequency	5	x	20	15	y	5

32. a) A straight highway leads to the foot of a tower. Ramaiah standing at the top of the tower observes a car at an angle of depression 30° . The car is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be 60° . Find the time taken by the car to reach the foot of the tower from this point.

OR

- b) One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting :
- i) A queen of black colour ii) a face card
- iii) a jack of diamond iv) a club card

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33. a) Draw the graph of the polynomial $P(x) = x^2 - 2x - 8$ and find its zeroes.

OR

- b) Construct an isosceles triangle whose base is 6 cm and altitude is 3 cm. Then draw another triangle whose sides are $1\frac{1}{3}$ times the corresponding sides of the isosceles triangle.



Mathematics Model Paper:2022-23

Blue Print and Weightage Tables.

Blue Print:

Q. No.	Unit No.	A.S. No.	Q. No.	Unit No.	A.S. No.	Q. No.	Unit No.	A.S. No.	Q. No.	Unit No.	A.S. No.
1	4	3	13	4	1	21	3	2	29(a)	1	2
2	3	2	14	14	4	22	4	1	29(b)	6	2
3	1	1	15	2	3	23	2	5	30(a)	5	1
4	5	1	16	1	1	24	6	1	30(b)	10	1
5	10	1	17	9	5	25	9	1	31(a)	7	1
6	2	1	18	11	1	26	11	3	31(b)	14	1
7	8	3	19	14	3	27	13	4	32(a)	12	4
8	11	4	20	7	2	28	8	2	32(b)	13	4
9	7	1							33(a)	3	5
10	12	5							33(b)	8	5
11	14	2									
12	9	1									

Weightage Table:

Academic Standard – I	Academic Standard – II	Academic Standard – III	Academic Standard – IV	Academic Standard – V
6x1m.=6m.	2x1m.=2m.	2x1m.=2m.	1x1m.=1m.	1x1m.=1m.
3x2m.=6m.	1x2m.=2m.	2x2m.=4m.	1x2m.=2m.	1x2m.=2m.
3x4m.=12m.	2x4m.=8m.	1x4m.=4m.	1x4m.=4m.	1x4m.=4m.
2x8m.=16m.	1x8m.=8m.		1x8m.=8m.	1x8m.=8m.
40m.	20m.	10m.	15m.	15m.