SSC PUBLIC EXAMINATIONS : JULY-2020
MATHEMATICS - PAPER - I & II
MODEL PAPER
(English Medium)

Time: 3 Hrs. 15 Min. **Max. Marks : 100 Marks**

Instructions:

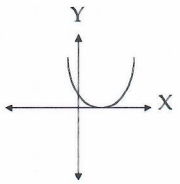
1. Answer ALL the questions in a separate answer Booklet.
2. The question paper consists of 4 Sections and 33 questions.
3. There is an internal choice in Section-IV.
4. Write answers neatly and legibly.

SECTION – I

Note: 1. Answer ALL the questions in ONE WORD or PHRASE.
2. Each Question carries 1 Mark.
3. If any question is answered more than once, the first answer only will be considered.

12 × 1 = 12

1. The No. of subsets of an empty set is
   A) 0 B) 1 C) 2 D) 3
2. The No. of zeroes of the following graph of the polynomial is .....



3. log 10, log 100, log 1000, ... are in _____ progression.
4. If x = 2 is a solution of 2x + 3y = 13 then y = ...
5. Find the common ratio of G.P $\sqrt{2}, \sqrt{8}, \sqrt{32}, ...$
6. Choose the correct answer satisfying the following statements.

   Statement (A) : $2x^3 + 3\sqrt{x} - 5$ is not a polynomial.

   Statement (B) : Zero of the polynomial 2x – 3 is $\frac{3}{2}$

   (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.
7. Slope of the line x = 3 is
   A) sin 0° B) cos 90°
   C) tan 90° D) tan 0°

8. Find the area of semi circle whose radius is 7 cm.
9. Match the following.

A) $\sin\theta$	( )	(i)	$\frac{1}{\sec\theta}$
B) $\cos\theta$	( )	(ii)	$\frac{\sin\theta}{\cos\theta}$
C) $\tan\theta$	( )	(iii)	$\frac{1}{\operatorname{cosec}\theta}$

a) A-(i), B-(ii), C-(iii) b) A-(ii), B-(iii), C-(i)
c) A-(iii), B-(i), C-(ii) d) A-(ii), B-(i), C-(iii)

10. What is the probability to pick a jack card from a deck of cards.
11. The mean of $x + 3$, x, $x - 3$ is _____ .
12. The point lies in Q_1 is
A) $(3, -2)$ B) $(-3, 5)$
C) $((7, 1)$ D) $(-6, -3)$

SECTION – II

Note: 1. Answer all the Questions.
2. Each Question carries 2 Marks. **8 × 2 = 16**

13. Show that $\log 1000 = 3 \log 2 + 3 \log 5$.
14. Draw the rough graph for $x = y$.
15. Find the roots of the quadratic equation $x^2 + 4x + 5 = 0$.
16. Find the volume of a sphere of radius 2.1 cm.
17. In ΔABC, $BC \parallel DE$ and $\frac{AD}{DB} = \frac{3}{5}$, $AC = 5.6$ cm, then find the value of AE.
18. Find the value of $\frac{2\tan 30^\circ}{1+\tan^2 30^\circ}$.
19. Write all the possible outcomes when three coins are tossed at a time.
20. Write the formula to find the Median of grouped data and explain the terms in it.

SECTION – III

Note: 1. Answer all the Questions.
2. Each Question carries 4 Marks. **8 × 4 = 32**

21. If $A = \{x : x$ is an even natural number less than $10\}$
$B = \{x : x \in N$ and $4 < x < 10\}$ then find
(i) $A \cup B$ (ii) $A \cap B$ by using Venn diagram.

22. Show that $a_1, a_2, a_3, \ldots\ldots a_n$ form on A.P where a_n is defined as $a_n = 3 + 4n$ and find sum of the first 15 terms.

23. Write the following sets in the set-builder form

(i) A = {3, 6, 9, 12} (ii) B = {2, 4, 8, 16, 32}

(iii) C = {5, 25, 125, 625} (iv) D = {1, 4, 9, 25, ... 100}.

24. Find 10^{th} and n^{th} term of G.P. 5, 25, 125, ...

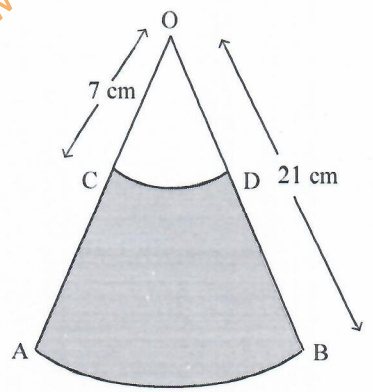
25. Find the co-ordinates of midpoint of line joining the points

(sin 45°, tan 30°), (cos 45°, cot 60°).

26. In two concentric circles, a chord of length 24 cm of larger circle becomes a tangent to the smaller circle whose radius is 5 cm. Find the radius of the larger circle.

27. Show that the point A(a, 0), B(–a, 0), C(0, $a\sqrt{3}$) are the vertices of a equilateral triangle.

28. AB and CD are respectively arcs of two concentric circles of radii 21 cm and 7 cm with centre 'O'. If $\angle AOB = 30°$, find the area of shaded region. (Use $\pi = \frac{22}{7}$)



SECTION-IV

Note: 1. Answer all the Questions.
2. Each Question carries 8 Marks.
3. There is an internal choice for each question. **5 × 8 = 40**

29. a) Show that $\sqrt{11}$ is an irrational number.

(OR)

b) Verify that 1, –1 and –3 are the zeroes of the cubic polynomial $x^3 + 3x^2 - x - 3$ and check the relationship between zeroes and the coefficients.

30. a) Find the roots of the quadratic equation $2x^2 + x - 4 = 0$ by the method of completing the square.

(OR)

b) A storage tank consists of a circular cylinder with a hemisphere stuck on either end. If the external diameter of the cylinder be 1.4 m and its length be 8 m. Find the cost of painting it on the outside at rate of ₹ 20 per m^2.

31. a) Evaluate the following.

(i) $\frac{\sin^2 15° + \sin^2 75°}{\cos^2 36° + \cos^2 54°}$ (ii) $\sin 5° \cdot \cos 85° + \cos 5° \cdot \sin 85°$

(OR)

b) The table below shows the daily expenditure on food of 25 households in a locality.

Daily expenditure (in Rupees)	100-150	150-200	200-250	250-300	300-350
Number of households	4	5	12	2	2

Find the mean daily expenditure on food.

32. a) From the top of a building, the angle of elevation of the top of a cell tower is 60° and the angle of depression to its foot is 45°. If distance of the building from the tower is 7m, then find the height of the tower.

(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 red face card (iv) a red jack.

33. a) Solve the linear equations $2x - 3y = 6$ and $4x - 6y = 12$ graphically.

(OR)

b) Construct a triangle shadow similar to the given ΔABC, with its sides equal to $\frac{5}{3}$ of the corresponding sides of ΔABC.