

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

**Time: 3 Hrs. 15 Min.**

**Max. Marks : 100 Marks**

**Instructions:**

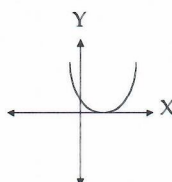
1. Answer ALL the questions in a separate answer Booklet.
2. The question paper consists of 4 Sections and 33 questions.
3. There is an internal choice in Section-IV.
4. Write answers neatly and legibly.

**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.  $\log 10, \log 100, \log 1000, \dots$  are in \_\_\_\_\_ progression.
4. If  $x = 2$  is a solution of  $2x + 3y = 13$  then  $y = \dots$
5. Find the common ratio of G.P  $\sqrt{2}, \sqrt{8}, \sqrt{32}, \dots$
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)  $\sin 0^\circ$                                       B)  $\cos 90^\circ$   
 C)  $\tan 90^\circ$                                       D)  $\tan 0^\circ$

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.

$8 \times 2 = 16$

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  $\triangle ABC$ ,  $BC \parallel DE$  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

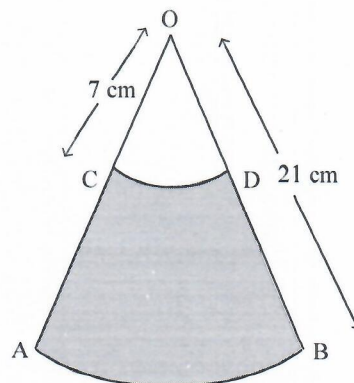
**Note:** 1. Answer all the Questions.

2. Each Question carries 4 Marks.

$8 \times 4 = 32$

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

22. Show that  $a_1, a_2, a_3, \dots, a_n$  form an 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)  $D = \{1, 4, 9, 25, \dots, 100\}$ .
24. Find  $10^{\text{th}}$  and  $n^{\text{th}}$  term of G.P. 5, 25, 125, .....
25. Find the co-ordinates of midpoint of line joining the points  $(\sin 45^\circ, \tan 30^\circ)$ ,  $(\cos 45^\circ, \cot 60^\circ)$ .
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 an equilateral triangle.
28. AB and CD are respectively arcs of two concentric circles of radii 21 cm and 7 cm with centre 'O'. If  $\angle AOB = 30^\circ$ , 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.



