

SET - 3

MODEL PAPER - 1
S.S.C. PUBLIC EXAMINATIONS - 2021
MATHEMATICS
(English Medium)

Class : X

(Max. Marks : 100)

Time : 2hr. 45 min.

Instructions to students :

1. There are four sections and 33 questions in this paper.
2. Answers should be written in a given answer sheets.
3. There is an internal choice in Section - IV
4. Write all the questions visible and legibly.
5. 15 Minutes are given for reading the question paper and 2hr 30 min given for writing answers.

Section - I**Note : 1. Answer all the Questions.****2. Each Question carries 1 mark****12 x 1 = 12 M**

1. The distance from (3,4) to the X - axis is ()
 A) 3 units B) 4 units C) 5 units D) 7 units
2. The zero value of p(x) is k then ()
 A) k =0 B) p(k)=0 C) p(-k)=0 D) p(-k)=1
3. The sum of the zeroes of $ax^3 + bx^2 + cx + d$ ($a \neq 0$) is ()
 A) $-\frac{b}{a}$ B) $\frac{b}{a}$ C) $\frac{a}{b}$ D) $-\frac{a}{b}$
4. $\frac{1 - \tan^2 45^\circ}{1 + \tan^2 45^\circ}$ ()
 a) $\tan 90^\circ$ b) 1 c) $\sin 45^\circ$ d) 0
5. If x, y, z are in A.P. then z = ()
 A) 2x+y B) 2y+x C) x-2y D) 2y-x
6. If $\tan A = \frac{1}{\sqrt{2}}$ then A = ()
 A) 30° B) 0° C) 45° D) 60°
7. The zeroes of the polynomial $x^2 + 1 = 0$ ()
 A) ± 1 B) 0,1 C) -1,1 D) does not exist

8. If AP and AQ are the two tangents a circle with centre O so that $\angle POQ = 110^\circ$. then $\angle PAQ$ is equal to ()
a) 60° b) 70° c) 80° d) 90°
9. The mean of first ten odd natural numbers is ()
A) 10 B) 20 C) 30 D) 40
10. If $n(A) = 5$ then the number of all proper subsets of A is ()
A) 32 B) 31 C) 30 D) 16
11. Which of the following point lies on the Y - axis ()
A) (0,x) B) (0,y) C) (0,0) D) All of them
12. The slope of the line parallel to Y - axis is ... ()
A) 0 B) 1 C) $1/2$ D) not defined

Section - II

Note : 1. Answer all the Questions.

2. Each Question carries 2 Marks.

8 x 2 = 16 M

13. If $A = \{4,5,6\}$; $B = \{7,8\}$ then show that $A \cup B = B \cup A$.
14. Check whether the following pair of equations is consistent or inconsistent.
 $x + y = 8$; $3x + 3y = 14$
15. Write two more polynomials and create two questions for each of them.
16. Write GP if $a = 256$, $r = \frac{-1}{2}$
17. If $P(E) = 0.05$, what is the probability of 'not E' ?
18. The wickets taken by a bowler in 10 cricket matches are as follows : 2, 6, 4, 5, 0, 2, 1, 3, 2, 3.
Find the mode of the data.
19. Find the distance between A(1,-3) and B (-4,4) and rounded off to two a decimal.
20. Rajender observes a person standing on the ground from a helicopter at an angle of depression 45° . If the helicopter flies at a height of 50 meters from the ground, what is the distance of the person from Rajender ?

Section - III

Note : 1. Answer all the Questions.

2. Each Question carries 4 Marks

8 x 4 = 32 M

21. Find x if $2\log 5 + \frac{1}{2}\log 9 - \log 3 = \log x$
22. The sum of a two digit number and the number obtained by reversing the digits is 66. If the digits of the number differ by 2, find the number. How many such numbers are there ?
23. Match the roaster form with set builder form.
- (i) $\{1,2,3,6\}$ (a) $\{x : x \text{ is prime number and a divisor of } 6\}$
- (ii) $\{2,3\}$ (b) $\{x : x \text{ is an odd natural number smaller than } 10\}$
- (iii) $\{M, A, T, H, E, I, C, S\}$ (c) $\{x : x \text{ is a natural number and divisor of } 6\}$
- (iv) $\{1,3,5,7,9\}$ (d) $\{x : x \text{ is a letter of the word MATHEMATICS}\}$
24. Find two consecutive positive integers, sum of whose squares is 613.
25. Find the coordinates of the point P on AD such that AP : PD = 2:1
26. A survey was conducted by a group of students as a part of their environment awareness programme, in which they collected the following data regarding the number of plants in 20 houses in a locality. Find the mean number of plants per house.

Number of plants	0-2	2-4	4-6	6-8	8-10	10-12	12-14
Number of houses	1	2	1	5	6	2	3

27. Evaluate the and justify your answer $\frac{\sin^2 15^\circ + \sin^2 75^\circ}{\cos^2 36^\circ + \cos^2 54^\circ}$
28. A dice is thrown twice. What is the probability that (i) 5 will not come up either time ? (ii) 5 will come up at least once ?

Section - IV

Note : 1. Answer all the Questions.

2. Each Question carries 8 marks

3. There is an internal choice for each question 5 x 8 = 40 M

29. If $A = \{1,2,3,4\}$; $B = \{1,2,3,4,5,6,7,8\}$ then find $A \cup B$, $A \cap B$. What do you notice about the result ?

(or)

Find the HCF and LCM of 12 and 18 by the prime factorization method.

30. If A, B and C are interior angles of triangle ABC, then show that $\sin \frac{B+C}{2} = \cos \frac{A}{2}$

(or)

If $\operatorname{cosec} \theta + \cot \theta = k$ then prove that $\cos \theta = \frac{k^2 - 1}{k^2 + 1}$.

31. In a retail market, fruit vendors were selling oranges kept in packing baskets. These baskets contained varying number of oranges. The following was the distribution of oranges.

Number of oranges	10-14	15-19	20-24	25-29	30-34
Number of baskets	15	110	135	115	25

(or)

Show that the points $(-4,-7)$ $(-1,2)$ $(8,5)$ and $(5,-4)$ taken in order the vertices of a rhombus and find its area. (Hint : Area of rhombus = $\frac{1}{2} \times$ product of it's diagonals)

32. A girl of height 90 cm is walking away from the base of a lamp post at a speed of 1.2 m / sec. if the lamp post is 3.6m above the ground, find the length of her shadow after 4 seconds.

(or)

Two trains leave a railway station at the same time the first train travels towards west and the second train towards north. The first train travels 5km/hr faster than the second train. If after two hours they are 50 km apart find the average speed of each train.

33. 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.

(or)

Find the area of the segment AYB showing in the adjacent figure. If radius of the circle is 21 cm and $\angle AOB = 120^\circ$ (Use $\pi = \frac{22}{7}$ and $\sqrt{3} = 1.732$)