SET – 2

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. A line makes 45^0 with X – axis, then its slope is ……. ( )

   A) 0 B) 1 C) -1 D) 2

2. The zero value of $p(x) = ax + b$ is ..... ( )

   A) $\frac{a}{b}$ B) $-\frac{a}{b}$ C) $\frac{b}{a}$ D) $-\frac{b}{a}$

3. If $ax + b$ is a factor of a polynomial p(x) then ..... ( )

   A) $P\left(\frac{b}{a}\right) = 0$ B) $P\left(\frac{a}{b}\right) = 0$ C) $P\left(\frac{-b}{a}\right) = 0$ D) $P\left(\frac{-a}{b}\right) = 0$

4. $\frac{2\tan 30^0}{1-\tan^2 30^0}$ ( )

   a) $\cos 60^0$ b) $\sin 60^0$ c) $\tan 60^0$ d) $\sin 30^0$

5. In an A.P. $a_9 = -6$ *and* $d = \frac{5}{4}$ *then* $a_{25} =$ ( )

   A) 46 B) 41 C) -16 D) 14

6. If sinA = $\frac{3}{5}$ then cos A ( )

   A) $\frac{4}{5}$ B) $\frac{3}{5}$ C) $\frac{5}{3}$ D) $\frac{5}{4}$

7. If $p(x) = 4x^2 + 3x - 1$ *then* $p\left(\frac{1}{4}\right) = ...$ ( )

A) 2 B) -1 C) 5/4 D) 0

8. If tangents PA and PB from appoint P to a circle with centre O are inclined to each other at angle of 80^0. Then $\angle POA$ is equal to ( )

a) 50^0 b) 60^0 c) 70^0 d) 80^0

9. A secant of a circle cuts the circle at … points/ point ( )

A) only one B) two C) three D) no

10. n(A)=13,n(B)=16,n($A \cap B$) = 9 then $n(A \cup B) = ...$ ( )

A) 19 B) 20 C) 4 D) 7

11. The area of the square whose vertices are (0,-1), (2,1), (0,3) and (-2,1) is … ( )

A) 2 sq. units B) $2\sqrt{2}$ sq. units C) 4 sq. units D) 8 sq. units

12. The slope of 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 = $\{6,9,11\}; \phi = \{\ \}$, *find* $A \cup \phi$, $A \cap \phi$

14. Solve the given pair of equations using substitution method.

$x + y = 5$ *and* $x - y = 1$

15. State which of the following statements are true and which are false ? Give reasons for your choice.

16. Find the 10^{th} term of the AP :

5,1,-3,-7

17. In case of a die is getting a 1 complementary to events getting 2, 3, 4, 5, 6 ? Give reasons for your answer.

18. Find the mean of first n Natural numbers

19. Find the centroid of the triangle whose vertices are (3,-5), (-7,4), (10,-2) respectively.

20. Two men on either side of a temple of 30 meter height observe its top at the angles of elevation 30^0 and 60^0 respectively. Find the distance between the two men.

Section – III

Note : 1. Answer all the Questions.

2. Each Question carries 4 Marks **8 x 4 = 32 M**

21. If $x^2 + y^2 = 25xy$, then prove that $2\log(x+y) = 3\log 3 + \log x + \log y$.

22. Two angles are complementary. The larger angle is 3^0 less than twice the measure of the smaller angle. Find the measure of each angle by drawing the graph.

23. Which of the following are sets ? Justify your answer.

24. Find the roots of the $3(x-4)^2 - 5(x-4) = 12$ quadratic equation by factorization

25. Find the radius of the circle whose centre is (3,2) and passes through (-5,6).

26. A survey conducted on 20 households in a locality by a group of students resulted in the following frequency table for the number of family members in a household.

Family size	1-3	3-5	5-7	7-9	9-11
Number of families	7	8	2	2	1

27. Is it right to say $\cos(60^0+30^0) = \cos 60^0 \cos 30^0 - \sin 60^0 \sin 30^0$.

28. A bag contains lemon flavoured candies only. Malini take out one candy without looking into the bag. What is the probability that she takes out

(i) an orange flavoured candy ? (ii) a lemon flavoured candy ?

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. Write the following sets in the set – builder form.

(i) $\{3,6,9,12\}$ (ii) $\{2,4,8,16,32\}$ (iii) $\{5,25,125,625\}$ (iv) $\{1,4,9,16,25.....100\}$

(or)

If $(2.3)^x = (0.23)^y = 1000$ then find the value of $\frac{1}{x} - \frac{1}{y}$.

30. Prove the $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} = \operatorname{cosec}\theta + \cot\theta$

(or)

Prove that $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$.

31. The following distribution shows the daily pocket allowance of children of a locality. The mean pocket allowance is Rs. 18. Find the missing frequency *f*.

Daily pocket allowance (in Rupees)	11-13	13-15	15-17	17-19	19-21	21-23	23-25
Number of children	7	6	9	13	*f*	5	4

(or)

Find a point on the Y- axis which is equidistant form both the points A (6,5) and B (-4,3).

32. Prove that a line joining the midpoints of any two sides of a triangle is parallel to the third side. (Using converse of Basic proportionality theorem).

(or)

The altitude of a right triangle is 7cm less than its base. If the hypotenuse is 13 cm, find the other two sides.

33. Verify that $3, -1, -\frac{1}{3}$ are the zeroes of the cubic polynomial.

(or)

Draw a circle with the help of a bangle, Take a point outside the circle. Construct the pair of tangents from this point to the circle measure them. Write conclusion.