SET – 5

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. If (1,2) (-3,4) and (7,-k) are collinear, k = ? ( )

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

2. The zero values of $p(x) = x^2 - x(\alpha + \beta) + \alpha\beta$ are ..... ( )

   A) $-\alpha, -\beta$ B) $\alpha, -\beta$ C) α, β D) $-\alpha, \beta$

3. If $p(x)$ is divided exactly by $x + a$ then the remainder is ..... ( )

   A) a B) $-a$ C) p(a) D) $p(-a)$

4. $\sin^2\theta + \cos^2\theta =$ ..... ( )

   A) 0 B) 90^0 C) 1 D) -1

5. The sum of first 10 terms of the A.P., 2, 7, 12, ……. ( )

   A) 250 B) 245 C) 240 D) 235

6. How many cards are of red colour present in a deck of playing cards ?

   A) 52 B) 39 C) 13 D) 26 ( )

7. $p(x) = x^2 - 3x + 2$ *then* $p(0) =$ ( )

   A) 0 B) 2 C) -3 D) 1

8. From a point Q, the length of the tangent to a circle is 24 cm. and the distance of Q from the centre is 25 cm. the radius of the circle is ( )

   a) 7cm b) 12 cm c) 15 cm d) 24.5 cm.

9. Outer surface area of a spherical shell = ( )

A) $4\pi r^2$ B) $3\pi r^2$ C) $2\pi r^2$ D) $\frac{4}{3}\pi r^3$

10. If n(A)=4 then n (p(A))= ..... ( )

A) 2 B) 4 C) 8 D) 16

11. The slope of X – axis is …. ( )

A) 0 B) 1 C) 1/2 D) not defined

12. The slope of x – axis is ( )

A) 0 B) 1 C) -1 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 and B are two sets such that $A \subset B$ then what is $A \cup B$?

14. Solve the following systems of equations :

$2x - y = 4$; $4x - 2y = 6$

15. P(x) = 3x -1, Find P (1), P (-1)

16. Find the common ratio of the GP $25, -5, 1, \frac{-1}{5}$.

17. Find the probability of getting a head when a coin is tossed once. Also find the probability of getting a tail.

18. Find the mean of 1, 2, 3, 4, 5, 6.

19. Determine x so that 2 is the slope of the line through, P (2,5) and Q (x,3).

20. From the top of a building, the angle of elevation of the top of a cell tower is 60^0 and the angle of depression to its foot is 45^0. If distance of the building from the tower is 7m, then find the height of the tower.

Section – III

Note : 1. Answer all the Questions.

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

21. Find the HCF of 90^0 and 270

22. Suppose you have Rs. 12000 to invest. You have to invest some amount at 10% and the rest at 15%. How much should be invested at each rate to yield 12% on the total amount invested ?

23. If $A = \{3,6,9,12,15,18,21\}$; $B = \{4,8,12,16,20\}$

$C = \{2,4,6,8,10,12,14,16\}$; $D = \{5,10,15,20\}$ find

(i) A-B (ii) A-C (iii) A-D (iv) B-A

24. Find two consecutive odd positive integers, sum of whose square is 290.

25. Show that the points A(4,2), B (7,5) and C (9,7) are there points lie on a same line.

26. 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 house holds	4	5	12	2	2

Find the mean daily expenditure on food by a suitable method.

27. Evaluate the $(1+\tan\theta+\sec\theta)(1+\cot\theta-\operatorname{cosec}\theta)$

28. A Kiddy bank contains hundred 50 p coins, fifty Rs. 1 coins, twenty Rs. 2 coins and ten Rs. 5 coins. If it is equally likely that one of the coins will fall out when the bank is turned upside down, what is the probability that the coin (i) will be a 50 p coin ? (ii) will not be a Rs. 5 coin ?

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. State the reasons for the following :

(i) $\{1,2,3,.....10\} \neq \{x : x \in N \text{ and } 1 < x < 10\}$

(ii) $\{2,4,6,8,10\} \neq \{x : x = 2n+1 \text{ and } x \in N\}$

(iii) $\{5,15,30,45\} \neq \{x : x \text{ is a multiple of } 15\}$

(iv) $\{2,3,5,7,9\} \neq \{x : x \text{ is a prime number}\}$

(or)

Find the LCM and HCF of 17, 23 and 29 by the prime factorization method.

30. Simplify secA (1-sinA) (secA+ tanA)

(or)

Evaluate the $2\tan^2 45^0 + \cos^2 30^0 - \sin^2 60^0$

31. The following table shows the ages of the patients admitted in a hospital during a year :

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
Number of patients	6	11	21	23	14	5

Find the mode and the mean of the data given above. Compare and interpret the two measures of central tendency.

(or)

Find the values of y for which the distance between the points P(2,-3) and Q(10,y) is 10 units.

32. D,E,F are mid points of sides BC, CA, AB of ΔABC. Find the ratio of areas of $\Delta DEF \text{ and } \Delta ABC$.

(or)

A motor boat whose speed is 18 km/h in still water. It takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

33. Find all the zeroes of $2x^4 - 3x^3 + 6x - 2$, if you know that two of its zeroes are $\sqrt{2} \text{ and } -\sqrt{2}$.

(or)

A car has two wipers which do not overlap. Each wiper has a blade of length 25 cm. sweeping through an angle of 115^0. Find the total area cleaned at each sweep of the blades. (use $\pi = \frac{22}{7}$)