SET-2

MODEL PAPER - 2
S.S.C. PUBLIC EXAMINATIONS-2021
MATHEMATICS

(English Medium)

Class : X **(Max. Marks:100)** **Time : 2hr.45min.**

Instructions to students:

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

Section - I

Note : 1. Answer all the Questions.
2. Each Question carries 1 mark **12 × 1 = 12**

1. A = {1,2,3,4,6} and B={2,3,4}then $A \cap B$ = _____
2. The general form of A.P. is a, a+d, a+2d, a+3d .... Which of the following represent 'd'. ( )
   A) First term B) Common difference
   (C) Common ratio (D) Last term
3. Tangent touches the circle at _____ point(s).
4. Distance between A(2,4) and B(1,2) is _____ units.
5. Which of the following statement is correct? ( )
   Statement p : $\sin^2 A + \cos^2 A = 1$
   Statement q: $\sin(90^0 - A) = \cos A$
   (A) p is true, q is false (B) p is false, q is true
   (C) Both p , q are true (D) Both p, q are false
6. P(E) = 0.5 then $P(\overline{E})$ = _____
7.  Name the shape of this figure _____

   (A) Hemi sphere (B) Sphere (C) Circle (D) Cylinder

[Turn Over

8. Number of subsets of an empty set ( )

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

9. Which of the following point is in the first Quadrant ? ( )

(A) (−2,3) (B) (2,−3) (C) (2,3) (d) (−2,−3)

10. Match the following ( )

(a) Sinθ ( ) (i) $\frac{\text{adj.side}}{\text{hypo}}$

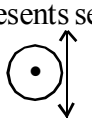
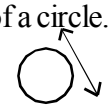
(b) Cosθ ( ) (ii) $\frac{\text{opp.side}}{\text{adj.side}}$

(c) Tanθ ( ) (iii) $\frac{\text{opp.side}}{\text{hypo}}$

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

(C) a-ii, b-iii, c-i (D) a-iii, b-ii, c-i

11. Which figure among the following represents secant of a circle. ( )

(A)  (B)  (C)  (D) 

12. Match the following ( )

a) LCM of 4 and 6 (i) $\frac{1}{\sqrt{3}}$

b) If x =1 in $x+y=3$. value of 'y' ? (ii) 2

c) $\text{Tan}30^0$=? (iii) 12

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

(C) a-(iii), b-(ii), c-(i) (D) a-(iii), b-(i), c-(ii)

Section - II

Note : 1. Answer all the Questions.

2. Each Question carries 2 Marks **8 × 2 = 16**

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13. Draw the Venn diagram for

    (1) $A \cup B$ (2) $A \cap B$ (3) $A - B$ (4) $B - A$

14. Check whether -2 and 2 are the zeros of the polynomial $x^4 - 16$

15. A person bought 3 pens and 2 pencils together and paid Rs.80/-. Express this in the form of a Linear equation.

16. If the points A(6,1) B (8,2) C(9,4) and D(p,3) are the vertices of a parallelogram taken in order, find the value of p ?

17. One card is drawn from a well shuffled deck of 52 cards. Calculate the probability that the card will (i) be an ace (ii) not be an ace.

18. Write any three Arithmetic progressions?

19. Find the Mean of 2,8,9,0,1 and 5 ?

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

Section - III

Note : 1. Answer all the Questions.

2. Each Question carries 4 Marks. **8 × 4 = 32**

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

22. Find the zeroes of the polynomial $x^2 - 3$ and verify the relationship between the zeroes and the coefficients.

23. Write the following sets in Roaster form.

    (a) A = $\{x : x$ is an odd natural number smaller than 10$\}$

    (b) B = $\{x : x$ is an integer, $x^2 = 4\}$

    (c) C = $\{x : x$ is a two digit natural number and the sum of its digits lessthan 8$\}$

    (d) D = $\{x : x$ is a Prime number and $x < 20\}$

24. The product of two consecutive positive integers is 306. Find those integers?

25. A bag contains of one red ball, one yellow ball and one blue ball. All are equal in size. Vahini takes out a ball from the bag without looking into. What is the probability that she takes one (i) yellow ball (ii) red ball (iii) blue ball and (iv) not an yellow ball.

26. The hypotenuse of a right angled triangle is 6 cm more than twice of the smallest side. Length of the third side is 2cm lessthan it's hypotenuse. Find lengths of it's sides.

27. If A, B and C are interior angles of a triangle ABC, then show that $\text{Tan}\left(\frac{A+B}{2}\right)=\text{Cot}\frac{C}{2}$

28. If a circle touches all the four sides of a quadrilateral ABCD at points P, Q, R and S, then prove that AB + CD = BC + DA.

Section - IV

Note : 1. Answer all the Questions.

2. Each Question carries 8 Marks. **5 × 8 = 40**

3. There is an internal choice for each question.

29. A = {x:x is the multiple of 3 between 5 and 20 which is also divisible by 9 }

B = {x:x is a positive integer and is a divisor of 18}

(i) Find $A-B$ and $B-A$. What do you obsrve?

(ii) Also represent this problem through venn diagram.

OR

If $3^x = 5^{x-2}$ then find the value of 'x'.

30. Show that

i) $\text{Tan}48^0\ \text{Tan}16^0\ \text{Tan}42^0\text{Tan}74^0 = 1$

ii) $\text{Cos}36^0\ \text{Cos}54^0 - \text{Sin}36^0\ \text{Sin}54^0 = 0$

OR

If $\text{Cosec}\theta + \text{Cot}\theta = k$ then prove that $\text{Cos}\theta = \frac{k^2 - 1}{k^2 + 1}$

31. If the median of 60 observotions is 28.5. Find the values of 'x' and 'y'.

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	5	x	20	15	y	5

OR

Find the ratio in which Y-axis divides the line seqment joining the points

(5,-6) and (-1, -4). Also find the point of intersection.

32. State and prove converse of pythagoras theorem.

OR

Δ ABC is a right angled triangle. Right angle is at 'C', BC=a, CA=b, AB=C and let 'p' be the length of perpendicular from 'C' on AB then prove that.

(i) pc=ab (ii) $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$

33. Draw the graph of $p(x) = x^2 - 6x + 9$ and find the zeros. Jistify the answer.

OR

Construct a tangent to a circle of radius 4 cm from a point on the concentric circle of radius 6 cm and measure it's length. Also verify the measurement by actual calculation.

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Note:- (1) Academic Standards are slightly deviated for this academic year due to Covid-19.
(2) Unit weightage is considered based on alternate academic calender.