CLASS : XI A/B/C
SUBJECT : MATHEMATICS

M.M : 100
TIME: 3 Hrs

SECTION – A

I. Each question carries 1 mark. (1 x 4 = 4)

1. If $A = \{3, 4, 5\}$, then write the power set of A.

2. Evaluate $\sin\left(\frac{-11\pi}{3}\right)$

3. If $\alpha + \beta = 90^\circ$, find the maximum and minimum values of $\sin\alpha \sin\beta$.

4. Write the solution set of $\frac{x+3}{x-2} \leq 2$

5. Find the equation of the circle, the coordinates of the end points of whose diameter are (-1 , 2) and (4, -3).

6. Two vertices of a triangle are (3 , -5) and (-7 , 4). If its centroid is (2, -1), find the third vertex.

7. Two sides of a square lie on the lines $x + y = 1$ and $x + y + 2 = 0$. What is its area?

8. Differentiate $2^x \cot x$.

9. There are 4 letters and 4 addressed envelopes. Find the probability that all the letters are not dispatched in right envelopes.

10. Find the median of the data: 4 , 6, 9 , 4 , 2 , 8 , 10.

SECTION – B

II. Each question carries 4 mark. (4 x 12 = 48)

11. If $A = \{1,2,3\}, B = \{3,4\}$ and $C = \{4,5,6\}$ find
(i) $A \times (B \cap C)$ (ii) $(A \times B) \cap (A \times C)$ (iii) write your observation.

12. Find the domain and range of the function $f(x) = \frac{3}{2 - x^2}$.

OR

In a survey of 700 students in a college, 180 were listed as drinking Limca, 275 as drinking Miranda and 95 were listed as both drinking Limca as well as Miranda. Find how many students were drinking neither Limca nor Miranda.

13. Evaluate $x^4 + 4x^3 + 6x^2 + 4x + 9$ when $x = -1 + i\sqrt{2}$.

14. If ${}^9P_5 + 5.{}^9P_4 = {}^{10}P_r$, find r.

15. Divide 32 into four parts which are in A.P such that product of extremes is to the product of means is 7:15.

16. Find the image of the point (2,1) w.r.t the line mirror $x + y - 5 = 0$

OR

Find the equations of the st.lines through (3,2) which make acute angle of 45° with the line $x - 2y - 3 = 0$

17. Differentiate $\sqrt{\cos x}$ w.r.t to x form first principles

18. Evaluate $\lim_{x \to \frac{\pi}{4}} \frac{\tan^3 x - \tan x}{\cos\left(x + \frac{\pi}{4}\right)}$ OR Evaluate $\lim_{x \to \frac{\pi}{4}} \frac{4\sqrt{2} - (\cos x + \sin x)^5}{1 - \sin 2x}$

ROLL NO :...69...

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SECTION-A

(1x10=10)

Q1. If $A = \{2,3,6\}, B = \{1,3,7,10\}$ then find A – B.

Q2. Find the domain of the function $\frac{x}{\sqrt{x^2 - 3x + 2}}$.

Q3. If $Tan69^0 + Tan66^0 - Tan69^0 . Tan66^0 = 2K$, then find K

Q4. Wirte the coordinates of the centroidof the triangle formed by vertices (8,0),(4,6) and(0,0).

Q5. Find the angle between the lines 2X-Y+3=0 and x+2y+3=0

Q6. Find the equation of the circle drawn on the intercept made by the line 2x+3y=6 between the coordinate axes as diameter.

Q7. Find $\frac{d}{dx}\{(x+|x|)|x|\}$.

Q8. A card is drawn from an ordinary pack of 52 cards and a gambler bets that, it is a spade or an ace . What is the probability that it is a spade or an ace.

$\frac{16}{52}$

Q9. Find the variance of the data: 5, 9, 10, 12, 8, 13, 6.

Q10. Solve $|x - 2| \geq 5$

SECTION-B

(4x12=48)

Q11. In a survey of 700 students in a college, 180 were listed as drinking limca 275 as drinking mrinda and 95 as drinking both Limca as well as Mirinda. Find how many were drinking neither Limca nor Mirinda.

OR

If $A = \{1,2,3\}, B = \{4,5\} and C = \{5,6\}$ verify that $A \times (B \cup C) = (A \times B) \cup (A \times C)$.

Q12. The Angles Of a Triangle Are In A.P. The Number Of Grades In The Least Is To The Number of Radians In The Greatest As 40:π.Find The Angles In Degrees.

Q13. With Usual Notations If In a ΔABC

$\frac{b+c}{11} = \frac{c+a}{12} = \frac{a+b}{13}$, Then Prove that $\frac{CosA}{7} = \frac{CosB}{19} = \frac{CosC}{25}$

Q14. Solve for x, $2Sin^2 x + Sin^2 2x = 2$

OR

Solve For x, $4 Sinx Sin2x Sin4x = Sin3x$.

Q15. Find the Equation of the Parabola with Vertex (2,-3) and Focus (0, 5).

OR

An arc is in the form of a parabola with its axis vertical. The arc is 10 m high and 5 m wide at the base. How wide is it 2m from the vertex of the parabola?

Q16. Differentiate $e^{\sqrt{Tanx}}$ From First Principle.