PRE BOARD –JAN 2024 **M.M.-80**

Time: 3 Hrs. **MATHEMATICS**

CLASS-XI

Section –A

Q1:- Multiple Choice Questions:

i . Let A={1,2,3,4,5,6}, Then

a. $10 \in A$ b. $5 \in A$ c. $5 \in A$ d. $5 \notin A$

ii. If A={2,4,6} and B={6,8,10}, then AUB=

a.{6} b.{2,4,6} c.{6,8,10} d. {2,4,6,8,10}

iii. If (x+1, y-2)=(3,1), then value of x is

a. 3 b. 2 c. 1 d. -1

iv. Radian measure corresponding to degree measure of 240° is

a. 4π b. $\frac{\pi}{2}$ c. $\frac{4\pi}{3}$ d. 2π

v. Value of Sin $[\frac{\pi}{6}]$

a. 0 b. $\frac{1}{2}$ c. $\frac{1}{\sqrt{2}}$ d. $\frac{\sqrt{3}}{2}$

vi. i^6=

a. 1 b. -1 c. i d. -i

vii. Solve -12x>30, When x is a natural number

a. $x<\frac{-5}{2}$ b. $x=\frac{-5}{2}$ c. $x>\frac{5}{2}$ d. $x<\frac{5}{2}$

viii. How many 3 digit numbers can be formed from the digits 1,2,3,4,5 when repetition is allowed .

a. 15 b. 5 c. 125 d. 25

ix. ${}^9P_3$ =

a. 27 b. 504 c. 9 d. 72

x. Third Term of sequence whose n^{th} term is $a_n=\frac{n}{n+1}$ is

a. 1/2 b. 2/3 c. 3/4 d. 4/5

xi Slope of line passing through the points (3,-2) and (2,4) is

a. 6 b. -6 c. $\frac{1}{6}$ d. $\frac{-1}{6}$

xii. Equation of circle with centre at (0,0) and radius r is

a. x-y =0 b. x+y=r c. $x^2+y^2=r^2$ d. $x^2-y^2=r^2$

xiii. Co ordinate planes divide the space into _____ octants

a. 4 b. 6 c. 2 d. 8

xiv. lim $_{x=>3}(x+3)=$

a. 0 b. 3 c. 6 d. 9

xv. lim $_{x=>9}$ $\frac{x^n-a^n}{x-a}$ =

a. na^{n-1} b. na^{n+1} c. na d. 1

xvi. A die is thrown , the probability that a number less than 6will appear is

a. $\frac{5}{6}$ b . $\frac{1}{6}$ c. $\frac{3}{6}$ d. $\frac{4}{5}$

Q2:- Fill in the blanks from the given options

1, 6, {a,b,c}, 1, equal , -1, π, 4a

1. If A={a,b} and B={a,b,c}, then AWB is _____
2. Tan $\frac{\pi}{4}$ =_____
3. i^2 = _____
4. 3! =_____
5. If the line l_1 is parallel to l_2, then their slopes are _____
6. Length of the latus Rectum of the parabola $y^2=4ax$ is _____
7. lim $_{r-->1}$ πr^2= _____
8. lim $_{x-->0}$ $\frac{\text{Sin } x}{x}$ =

Q 3. State True or False for the following statements .

1. Derivative of x^2 a+ x=10 is 20. (T/F)
2. Derivative of x^3 is 3x (T/F)
3. If A={3,5,7,9} AND B={9,11,13}, then A ∩B is {9} (T/F)
4. Cos (x+y)= Cosx Cosy – Sinx Siny (T/F)
5. Second Term of the Sequence $a_n=2^n$ is 8 (T/F)
6. ^nC_r = $\frac{n!}{r!(n-r)!}$ (T/F)

7. If Θ is the inclination of a Line l, then tan Θ is called slope of Line l (T/F)
8. The x- axis and y-axis taken together a plane known as YZ- plane (T/F)

Section –B

Q4. Solve $5x-3<7$, when x is an integer.

Q5. Compute $\frac{8!}{6!\ X2!}$

Q6. Express i^9+i^{19} in the form a+ib .

Q7. Find the equation of the line passing through the point (-4,3) with slope $\frac{1}{2}$

Q8. Adie is rolled Let E be the event "die shows 4"and F be the event "die shows even number" .Are E and F mutually exclusive .

Section – C

Q9. Prove $\sin^2\frac{\pi}{6}+\cos^2\frac{\pi}{3}-\tan^2\frac{\pi}{4}=\frac{-1}{2}$

Q10. Expand the expression $(1-2x)^5$

OR

Using Binomial Theorem , evaluate $(102)^5$

Q11. Find the 12th term of a G.P. whose 8th term is 192 and the common ratio is 2.

Q12. Find the centre and Radius of the circle $(x+5)^2+(y-3)^2=36$

Q13. Find the mean deviation about the mean for the date.
4,7,8,9,10,12,13,17

OR

Nane the octants in which the following points lie
(1,2,3), (4,-2,3), (4,-2,-5), (4,2,-5)

Section - D

Q14. If A={1,2,3,4}, B={3,4,5,6}, C={5,6,7,8} and D = [7,8,9,10). Find
1. AUB 2. AUC 3. BUC 4. BUD 5. AUBUC 6. AUBUD

(OR)

Find the value of other five Trigonometric Functions Cosx = -1/2 , x lies in third quadrant.

Q15. Determine n, if

1. $^{2n}C_3 : {}^nC_3 = 12:1$ 2. $^{2n}C_3 : {}^nC_3 = 11:1$

OR

Write the first Six Terms of the sequence, whose nth term is

$$a_n = \frac{2n-3}{6}$$

Q16. 1. $\lim_{x \to 0} \frac{(x+1)^5-1}{x}$ 2. $\lim_{x \to 2} \frac{3x^2-x-10}{x^2-4}$

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OR

Find the Derivative

1. $\frac{x-a}{x-b}$ 2. $(x-1)(x-2)$