



STUDENTS EDUCATION POINT ®

D-113, OPP. ARYA SAMAJ MANDIR, SHAKARPUR, DELHI-92

MATHEMATICS TEST

CLASS XI TH

Time : 3:00 hr

MM: 70

SECTION A

(SETS) 20 MARKS

1. Write the solution set of the equation $x^2 + x = 2$ in the roster form. (2)
2. Let $A = \{a, e, i, o, u\}$ and $B = \{a, i, u\}$ show that $A \cup B = A$. (2)
3. If R is the set of real numbers and Q is the set of rational numbers, then what is $R - Q$? (2)
4. Show that the set of letters needed to spell "CATARACT" and the set of letters needed to spell "TRACT" are equal. (2)
5. Assume that $P(A) = P(B)$. show that $A = B$. (2)
6. If $X = \{a, b, c, d\}$ and $Y = \{f, b, d, g\}$ find (3)
 - (i) $X - Y$
 - (ii) $Y - X$
 - (iii) $X \cap B$
7. In a survey of 400 students in a school, 100 were listed as taking apple juice 150 as taking oranges juice. Find how many students were taking neither apple juice nor orange juice. (3)
8. There are 200 individuals with a skin disorder, 120 had been exposed to the chemical C_1 , 50 to chemical C_2 , and 30 to both the chemicals C_1 and C_2 . find the number of individuals exposed to (4)
 - (i) Chemical C_1 but not chemical C_2 .
 - (ii) Chemical C_2 but not chemical C_1 .
 - (iii) Chemical C_1 or chemical C_2 .

SECTION B

(RELATIONS AND FUNCTIONS) 20 MARKS

9. If $(x/3 + 1, y - 2/3) = (5/3, 1/3)$ find the value of x and y . (2)
10. If $G = \{1, 2, 3\}$ from the set $G \times G \times G$. (2)
11. If $G = \{7, 8\}$ and $H = \{5, 4, 2\}$ find $G \times H$. (2)
12. Let $F = \{(1, 1)(2, 3)(0, -1)(-1, -3)\}$ be a linear function from Z into Z . find $f(x)$. (2)
13. If the set A has 3 elements and the set $B = \{3, 4, 5\}$ then find the number of elements in $A \times B$. (2)
14. Let $A = \{1, 2, 3, 4, 5, 6\}$ define a relation R from A to A by $R = \{(x, y) : y = x + 1\}$ (3)

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(i) Depict this relation using an arrow diagram.

(ii) Write down the domain co domain and range of R.

15. Find the domain and range of $f(x) = \sqrt{9 - x^2}$ (3)

16. Let $f(x) = x^2$ and $g(x) = 2x+1$ be two real functions find, (4)

$(f+g)(x), (f-g)(x), (fg)(x), (f/g)(x)$

SECTION C

(TRIGONOMETRIC FUNCTIONS) 30 MARKS

17. Find the value of $\tan 15^\circ$ (2)

18. Convert 6 radians in to degree measure. (3)

19. If the arcs of the same lengths in two circles subtend angles 65 and 110 at the center find the ratio of their radii. (3)

20. Find the angle in radian through which a pendulum swings if its length is 75 cm and the tip describes an arc of length. (3)

(i) 10 cm

(ii) 21 cm

21. Find the values of (any two) (4)

(i) $\sin 31\pi/3$

(ii) $\tan 19\pi/3$

(iii) $\operatorname{cosec} (-1410)$

22. If the $\cot x = -5/12$, x lies in second quadrant, find the values of other five trigonometric functions. (4)

23. Prove that: (4)

$$\frac{\cot^2 \pi}{6} + \frac{\operatorname{cosec} 5\pi}{6} = 6 - \frac{3\tan^2 \pi}{6}$$