Brain International School

Vikas Puri, New Delhi

ASSIGNMENT NO. 2

SUBJECT: MATHEMATICS CLASS-XI MAY,2025

CHAPTER : RELATIONS AND FUNCTIONS

Ques1. Let A={1,2,3…14}. Define a relation R from A to A by R={(x, y):3x-y=0, where x, y∈ A}. Write its domain, codomain and range.

Ques2. A={1,2,3,5} and B={4,6,9}. Define a relation R from A to B by R={(x, y):the difference between x and y is odd; x∈ $A, y \in B$}. Write R in roster form.

Ques3. Let A={1,2,3,4,6}. Let R be the relation on A defined by {(a, b): a, b∈ A, b is exactly divisible by a}.

(i) Write R in roster form.

(ii) Find the domain of R.

(iii) Find the range of R.

Ques 4. Find the domain and the range of the real function f defined by f(x)=$|x-1|$.

Ques 5. Let f={(x,$\frac{x^2}{1+x^2}$): $x \in R$} be a function from R into R. Determine the range of f.

Ques 6 A={1,3,5,7} and B={2,4,6,8} be two sets R be relation from A to B (x, y) such that x > y.

Ques 7 Let A be the set of first ten natural numbers and R={(x, y) ; x ε A and y ε A and x+2y=10} Write domain and range.

Ques 8 A relation R is defined on the set Z of integers as (x, y)ε R; $x^2 + y^2 = 25$. Express R.

Ques 9 Let R be the relation on the set N of natural numbers defined by R={(a, b); a+3b=12 a, b ε N}

Find: (i) R (ii) Domain of R (iii) Range of R

Ques 10 A relation R is defined from a set A ={2,3,4,5} to a set B ={3,6,7,10} as follows

(x, y)ε R⇒ x is relatively prime to y.

Ques11 Find domain and range of (i) f(x)=$\frac{1}{\sqrt{1-x}}$ (ii) f(x)= $\frac{x}{1+x^2}$ (iii) f(x)= $\frac{3}{2-x^2}$

Ques 12. The domain of the function f defined by f(x) = $\sqrt{a^2 - x^2}$ (a > 0) is

(a) (-a, a) (b) [-a, a] (c) [0, a] (d) (-a, 0]

Ques 13. The domain of the function f defined by f(x) = $\sqrt{x^2 - 9}$ is

(a) [-3, 3] (b) (-3, 3) (c) (-∞, -3] ∪ [3, ∞) (d) [0, 3]

Ques 14 The domain of the function f defined by f(x) = $\frac{x^2+2x+1}{x^2-x-6}$ is

(a) R – [3, -2] (b) R – {-3, 2] (c) R – {3, -2] (d) R – (-3, 2)

Ques15. find the degree measure for (i) ¼ (ii) -2

Ques 16. find radian measure corresponding to (i) -37°30′ (ans (ii) 5°37′30"

Ques 17. the angles of a triangle are in A.P. the number of degrees in the least is to the number of radians in the greatest is 60:π. Find the angles in degrees

Ques 18 A horse is tied to a post by a rope . if the horse moves along a circular path always keeping the rope Tight and describe 88 mtrs when it has traced out 72° at the centre . find the length of the rope.

Ques 19 A circular wire of radius 7.5 cm is cut and bent so as to lie along the circumference of a hoop whose Radius is 120 cm . find in degrees the angle which is subtended at the centre of the hoop.

Ques 20A railway train is travelling on a circular curve of 1500 mtrs radius at the rate of 66 km/hr. through What angle has it turned in 10 seconds

Ques 21. if $\sin\theta = 3/5$, $\tan\emptyset = 1/2$ and $\frac{\pi}{2} < \theta < \pi < \emptyset < \frac{3\pi}{2}$, find the value of $8\tan\theta - \sqrt{5}sec\emptyset$

Ques 22 find the value of cos(-480°) (ii) $\sin(-1125°)$

Ques 23 prove that $\sin(-420°)\cos(390°) + \cos(-660°)\,sin330° = -1$

Ques 24. prove that $\frac{\cos(90+\theta)\sec(-\theta)\tan(180-\theta)}{\sec(360-\theta)\sin(180+\theta)\cot(90-\theta)}$ =-1

Ques 25 if A,B,C and D are angles of a cyclic quad. Prove that cosA+cosB+cosC+cosD=0

Ques 26. in any quad. ABCD prove that

(i) sin(A+B)+ sin(C+D)=0 (II) cos(A+B)=cos (C+D)

Ques 27. IN ΔABC prove that $\cos(\frac{A+B}{2}) = \sin\frac{C}{2}$

Ques 28 prove that $\tan\frac{11\pi}{3} - 2sin\frac{4\pi}{6} - \frac{3}{4}cosec^2\frac{\pi}{4} + cos^2\frac{17\pi}{6} = \frac{3-4\sqrt{3}}{2}$

Ques 29 find x if $\text{cosec}(90+\theta) + xcos\theta\cot(90+\theta) = \sin(90+\theta)$