Clas:10

Time: 1.30 hrs Relations and functions Marks: 50

I. Answer any five of the following. Q. No 06 is compulsory 5×2=10

1. (-2, 3), (-2, 4), (0, 3),(0,4), (3, 3), (3, 4) } find A and B.
2. A Relation R is given by the set { (x, y) / y= x+3, x∈ { 0, 1, 2, 3, 4, 5} }. Determine its domain and range.
3. Define Cartesian product and Range.
4. Represent the function f(x) = $\sqrt{2x^2-5x+3}$ as a composition of two functions.
5. Find k if fof(k) = 5, where f(k) = 2k-1
6. The distance S (in kms) travelled by a particle in time 't' S(t) = $\frac{t2+t}{2}$. Find the distance travelled by the particle after

   (1) Three and half hours

   (2) Eight hours and fifteen minutes

II. Answer any seven of the following:Q.No14 is compulsory 7×5=35

7. Let A = The set of all natural numbers less than , B = The set of all prime numbers less than 8, and C = The set of all even prime numbers. Then verify that

   (1) (A B) × C = (A×C) (B×C)

   (2) A×(B-C) = (A×B) – (A×C)

8. A function f is defined by f(x) = 2x – 3

   (!) find $\frac{f(0)+f(1)}{2}$

   (!!) find x such that f(x) = 0

   (!!!) find x such that f(x) = x

   (!v) find x such that f(x) = f (1- x)

9. Show that (fog)oh = fo(goh), $f(x) = x^2$, g(x) = 2x, h(x) = x+4 .

10. If the function f:R→ R is defined by

$$f(x) = \begin{cases} 2x+7, \\ x^2-2, \\ 3x-2, \end{cases}$$

(!) f(4) (!!) f(-2) (!!!) f(4)+2f(1) (!V) $\frac{f(1)-3f(4)}{f(-3)}$

11. Let A → B be a function defined by $f(x) = \frac{x}{2} - 1$, where A = {2, 4, 6, 10, 12} B = { 0, 1, 2, 4, 5, 9 } represent f by

(!) Set of ordered pairs (!!) table

(!!!) an arrow diagram (!V) a graph

12. If f(x) = 3x- 2, g(x) = 2x +k, and if fog = gof , then find the value of k.

13. (!) A function f is defined by f(x) = 3 – 2x, then find x such that

$f(x^2) = (f(x))^2$

(!!) A plane is flying at a speed of 500 km per hour. Express the distance d travelled by the plane as function of time t in hours.

14. Find x if gff(x) = fgg(x), given f(x) = 3x+1, and g(x) = x+3

Anwer the following:1×5=5

15. Draw a circle of diameter 6 cm from a point which is 8cm away from its centre , Draw the two tangents and measure their lengths

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