ASSIGNMENT CLASS XII

MATHEMATICS

RELATIONS AND FUNCTIONS

1. If f (x) = |x| and g(x) = [x] . Evaluate – (fog) (-5/3) – (gof) (-5/3)
2. If f(x) = e^{2x} and g(x) = log $\sqrt{x}$, x > 0 , find
   (i) fog (ii) gof (iii) f + g (iv) fg
3. Let N be the set of all natural numbers and let R be the relation on N X N , defined by (a , b)R (c, d) -> ad = bc for all (a, b) , (c, d) ε NXN . Show that R is an equivalence Relation on NXN.
4. Let A = {x ε R : -1≤ x ≤ 1 } = B . Show that f : A -> B given by f(x) = x |x| is a bijection.
5. Let I be the set of integers. Define a relation R on I by a Rb -> a – b is divisible by 5 Show that R is an equivalence relation.
6. (a) Define a binary relation * on Q as follows :
   a* b = a +b –ab ; a, b ε Q. Find the identity element of (Q,*)
   (b) Test * for commutativity.
   (c) If the binary relation* on Z is defined by a*b = a +b +2, then write the identity element.

7. Prove that the function f: N ->N defined by f(n) = n^2+ n +1 is one one but not onto.

8. Let R be the set of real numbers. Show that the function f: R->R : f(x) = cosx is neither One one nor onto.

9. Let f , g : |x | + x and g (x) = |x| - x , for every x ε R .Then find fog and gof.

10. Let f : N -> R be a function defined as f(x) = 4 x^2 + 12x + 15. Show that f: N->Range f is invertible. Find the inverse of f.

11. Answer the following short answers

(i) Let f : R-> R be defined as f(x)= $\frac{x}{1+x^2}$. Then find (fofof)(x)

(ii) If f(x) = {4- $(x-7)^3$}, then find $f^{-1}(x)$

(iii) Let the binary operation * on N is defined by m*n = g.c.d (m,n). Determine whether * is commutative, associative.Write the value of (22) * (4)