First Semester First Series Online Test, January 2021

20MCA101 MATHEMATICAL FOUNDATIONS FOR COMPUTING

Duration: 1:00 Hr **Max.Marks:20**

PART A (*Answer all Questions*) (4*2marks= 8 Marks)

1. Let A = $\{1,2,3,4,5\}$ $B = \{1,2,5,6,7\}$. Find A-B, B-A and symmetric difference of A and B. (CO1)
2. Prove that $A \cap (B - A) = \emptyset$. (CO1)
3. Write the first five terms of the sequence $a_n = 5a_{n-1} + n^2, a_1 = 12$. (CO2)
4. Find the g.c.d of (1365,2597). (CO2)

PART B (*Answer all Questions*) (2*6marks=12 Marks)

5. Define equivalence relation and check whether the relation R on the set of integers is an equivalence or not R $= \{(a,b): a - b \text{ is an even integer}\}$. Give a relation that is not reflexive but symmetric. (CO1)

OR

6. (a) Let A = {1, 2, 3, 4}, and let R = {(1, 2),(2, 3),(3, 4),(2, 1)}. (CO1)
   Find the transitive closure and symmetric closure of R.
   (b) Give an example of a partial ordering.

7. (a) Solve the linear Diophantine equation $37x + 249y = 7$. (CO2)
   (b) Find the remainder when 2^{44} is divided by 89.

OR

8. (a) Solve the linear congruence $34x \equiv 60\ (mod\ 98)$. (CO2)
   (b) Prove that 53 is a prime. (CO2)