Total No. of Questions : 07

B.Sc.(Computer Science) (2013 & Onwards)   (Sem.–4)
NUMBER THEORY
Subject Code : BCS-401
M.Code : 72317

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.**

SECTION-A

1. **Answer the followings in short :**

    (a) Find G.C.D. of (49,210,350).

    (b) Show that n is odd iff $n \equiv 1(mod\,2)$.

    (c) Give an example to show that if $ab \equiv 0(mod\,m)$, then $a \not\equiv 0(mod\,m)$ and $b \not\equiv 0\,(mod\,m)$

    (d) Solve the linear congruence : $9x \equiv 21(mod\,30)$.

    (e) State Euclidean algorithm.

    (f) State Euler's theorem.

    (g) State Wilson's theorem.

    h) Define Euler phi function.

    (i) Calculate the value of $\varphi\,(360)$.

    (j) For n > 2, $\varphi\,(n)$ is an even integer.

SECTION-B

2. Prove that the numbers of primes are infinite.

3. Find values of x and y to satisfy $71x - 50y = 1$.

4. State and prove Fundamental theorem of Arithmetic.

5. State and prove Chinese remainder theorem.

6. State and prove Mobius inversion formula.

7. State and prove Fermat's theorem.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.