*POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE*

**Name of student** _____ **Enrollment No.**____ _____

**BENNETT UNIVERSITY, GREATER NOIDA**
**B.TECH. Semester - III**
**Makeup Test**
**ODD SEMESTER 2017**

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| COURSE CODE | : | ECSE203L | MAX. TIME (1 Hour) |
| COURSE NAME | : | Discrete Mathematical Structures | |
| COURSE CREDIT | : | 5.0 | MAX . MARKS : 15 |

Note: All questions are mandatory.

Q.1 (a) Let R be a relation defined on a set of positive integers such that for all x,y Z xRy if and only if x-y is divisible by 3. Prove that R is an equivalence relation. (2)

(b) Let f: R→R be a function defined as f(x) = 3x+5 and g: R→R be another function defined as g(x) = x+4. Find $(g \circ f)^{-1}$ and $f^{-1} \circ g^{-1}$ (1.5)

(c) Find whether function $f(x) = x^3$ is onto or not? Draw it graphically as well. (1.5)

Q.2 (a) Find the smallest number that satisfies all three of the following:
$x \equiv 2 (\text{mod } 3)$ $x \equiv 4 (\text{mod } 5)$ $x \equiv 5 (\text{mod } 7)$ (2)

(b) What is a hash table? Explain quadratic probing for resolving collisions while inserting in it with example. (2)

(c) Find 539 mod 3 using its digits and powers of 10 using modular arithmetic. (1)

Q.3 (a) Find the remainder when $3^{28}$ is divided by 5. (2)

(b) Define an algebraic system 'group' and give an example. (1)

(c) Find the first solution of linear Diophantine equation: 32x + 56y = 72 (2)