

POSSESSION OF MOBILE IN EXAMINATION IS A UFM PRACTICE

Name of Student ----- Enrolment No. -----

Department -----

BENNETT UNIVERSITY, GREATER NOIDA

Supplementary Examination, August 2018

COURSE CODE: ECSE203L

MAX. DURATION: **TWO HOURS**

COURSE NAME: DISCRETE MATHEMATICAL STRUCTURES

COURSE CREDIT: **4.0**

MAX. MARKS: **100**

Note:

- All questions are mandatory

Q.1 If set X and set Y are defined as: $X = \{1,2,3\}$ and $Y = \{2,4,5\}$. Find (10)

(a) $X \cap Y$ (b) $X \cup Y$ (c) $X - Y$ (d) $X \oplus Y$

Q.2 Let set X be defined as: $X = \{1,2,3,4,5\}$. A relation R from X to X is defined as: xRy iff $x+y > 8$. Find R. Is R reflexive? (10)

OR

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be a function defined as $f(x) = 3x+4$ and $g: \mathbb{R} \rightarrow \mathbb{R}$ be another function defined as $g(x) = x+2$. Find $(g \circ f)^{-1}$

Q.3 If there are 5 boxes to keep books, find the minimum number of books required to be sure that there are 2 books in atleast 1 box. (10)

Q.4 In how many ways can 3 diamonds and 2 clubs be selected from a pack of cards? (10)

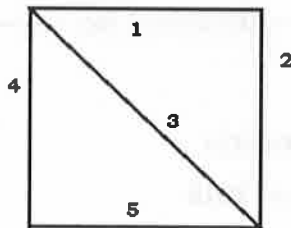
Q.5 In how many ways can 3 different history books, 4 different math books and 2 different English books be arranged on a bookshelf so that books of the same subjects are always together? (10)

Q.6 Use Principle of Mathematical Induction to prove that $1+2+2^2+\dots+2^n = 2^{n+1}-1$. (10)

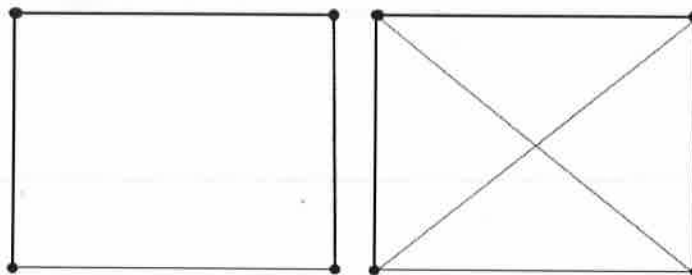
Q.7 Find the smallest number that satisfies all three of the following using Chinese Remainder Theorem: (10)

$x \equiv 2 \pmod{3}$ $x \equiv 4 \pmod{5}$ $x \equiv 5 \pmod{7}$

- Q.8 Consider the graph shown below. Draw the minimum spanning tree using Kruskal's method: (10)



- Q.9 Consider the graphs given below: (10)



(a)

(b)

Which of these is a regular graph and which one is a complete graph? Justify.

- Q.10 Explain any **two** of the following terms with suitable example and diagram (if any): (10)

- (a) Graph coloring
- (b) Algebraic system 'Subgroup'
- (c) Hash function
- (d) Depth First Search