Paper Id: 214306 Roll No:

MCA
(SEM-III) THEORY EXAMINATION, 2019-20
INTRODUCTION TO PROGRAMMING & COMPUTER ORGANIZATION

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a.	What do you mean by disjoint sets?
b.	Discuss Cartesian product of two sets.
c.	What do you mean by range of a relation?
d.	Discuss Complement law of Boolean algebra.
e.	How write operation is performed in memory?
f.	Explain indirect mode of instruction.
g.	Discuss do-while statement.

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a.	Prove the following by mathematical induction : $1^2 + 2^2 + 3^2 + \ldots\ldots\ldots + n^2 = [n(n + 1) (2n + 1)] / 6$
b.	What do you mean by partial order relation? Explain with the help of example.
c.	Simplify the following function with don't-care conditions : $F(A, B, C) = \sum (0, 2, 6)$ and $d(A, B, C) = \sum (1, 3, 5)$
d.	Discuss timing and control used for computer instructions.
e.	What is pseudocode? Discuss advantages and limitations of pseudocodes.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Let P and Q be the relation on set A = {1, 2, 3, 4}defined by P = {(1, 2), (2, 2), (2, 3), (2, 4), (3, 2), (4, 2), (4, 3)} Q = {(2, 2), (2, 3), (3, 2), (3, 3), (3, 4), (4, 1), (4, 2)} Find (i) PoP (ii) PoQ (iii) PoPoQ
(b)	Consider the relation '≤' on the set A = {2, 3, 4, 5}. Determine its inverse.

4. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Discuss various types of functions applied on sets.
(b)	Let A = {4, 5, 6, 7}. Determine whether the relation R = {(4, 5), (5, 4), (7, 6), (6, 7)} is reflexive, symmetric, transitive or anti-symmetric.

5. Attempt any *one* part of the following: 7 x 1 = 7

(a)	A sequential circuit has two D flip-flops A and B, two inputs x and y, and one output z. The flip-flop input equations and the circuit output are as follows: D(A) = x'y + xA, D(B) = x'B + xA, z = B. Draw the logic diagram and state table.
(b)	Show that half adder can be converted to half subtracter by using an additional NOT gate.

6. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Explain four phases instruction pipeline.
(b)	Discuss IEEE format for floating-point representation.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Discuss storage classes in C with the help of example.
(b)	What is algorithm? Discuss algorithm for adding first ten numbers.