

Roll. No.....

1212082

BCA 2nd Semester Examination

Jan.2014

Subject – Mathematical Foundation of Computer Science

Subject Code: CAL 104

Time Allowed: 03 hours.

Maximum Marks: 100

Before answering the question paper the candidate should ensure that they have been supplied the correct question paper. Complaints in this regard, if any, shall not be entertained after the examination.

Note: Question No. 1 is Compulsory and attempt any two questions from each section. All questions carry equal marks.

- 1(a) Give one example of each type of the relation R on $A=\{1,2,3\}$ having following properties
- (i) R is transitive but not Symmetric
 - (ii) R is both Symmetric and Antisymmetric (5)
- (b) Explain in how many ways a Relation is represented? (5)
- (c) Explain all Fundamental Connector with truth Table? (5)
- (d) Explain Multigraph & their representation? (5)

SECTION - A

- 2(a) Explain the concept of Isomorphic and Homomorphic graph through an example? (10)
- (b) What do you mean by Graph? Explain their types also? (10)
- 3(a) What do you mean by Composition of Relations? (10)
- Let $X=\{4,5,6\}$ $Y=\{a,b,c\}$ $Z=\{1,m,n\}$. Consider the relation R_1 from X to Y and R_2 from Y to Z
- $R_1=\{(4,a),(4,b),(5,c),(6,a),(6,c)\}$
- $R_2=\{(a,l),(a,n),(b,l),(b,m),(c,l),(c,m),(c,n)\}$
- Calculate $R_1 \circ R_2$
- (b) Explain Equivalence Relation with the help of example? (10)

- 4(a) What do you mean by Algorithm? Write down Merit & Demerit also. (10)
- (b) Explain Binary Search with the help of example? (10)

SECTION - B

- 5(a) Explain AVL Tree? Construct an AVL Tree by Inserting the following elements 64,1,14,26,13,110,88,95 (10)
- (b) Explain Binary search Tree? Write down algorithm for insertion in a Binary Search Tree? (10)
- 6(a) Explain Bubble Sort with the help of example? (10)
- (b) What do you mean by Sorting? Sort the Following element according to Bucket Sort (10)
- 47,58,23,11,8,44
- 7(a) Explain Tautologies, Contradiction, Contingency with truth table. (5)
- (b) From 10 programmers in how many ways can 5 be selected when
- (i) A Particular programmer is included every time.
 - (ii) A Particular programmer is not included at all. (5)
- (c) Explain Pigeonhole principle? (5)
- (d) What do you mean by Proposition Statement? (5)