(Please write your Exam Roll No.) Exam Roll No. 0691770017

END TERM EXAMINATION

SECOND SEMESTER [BCA] MAY 2018

Paper Code: BCA 102	***Subject: Mathematics-II***
Time : 3 Hours	***Maximum Marks :75***

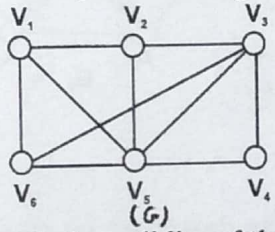
Note: Attempt any five questions including Q. NO.1 which is compulsory. Select atleast one question from each unit.

Q1. a) Let A= {1, 2, 3} and R= {(1,1), (1,2), (2,1), (2,2), (3,3)}. Show that R is equivalence relation. **(5)**

b) For all n ≥1, let a recursive function f(n) be defined as $f(n)=\begin{cases} 1 & n=1 \\ 1+f(n/2) & n-even \\ f(3n-1), & n>1 \text{ and } odd \end{cases}$. Is f a well defined function? **(5)**

c) Let A= {1,2,3,9,18}. Consider the partial order of divisibility on A. Draw the Hasse diagram of the poset (A,≤). **(5)**

d) Find all paths of length 2 in the following graph G. **(5)**



(G)

e) Check the validity of the argument:
If Dr. Das buys a car, then he can go home in time. If he goes in time, then his family will be happy. **(5)**

Unit-I

Q2. a) Construct the truth table to determine whether each of the following is a tautology, or an absurdity.? **(6)**
i) P∨~P ii) P∧~P

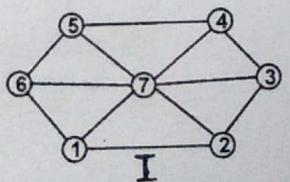
b) Show that P∨q ≡ q∨p, ~ (Pvq) ≡ ~ p ∧~q. **(6.5)**

Q3. If p(x) and Q(x) are propositions, then prove that
i) $(\forall x\, p(x)) \vee (\forall x Q(x)) = (\forall x\, (p(x) \vee Q(x))$
ii) $\exists x(p(x) \wedge Q(x)) = \exists x\, p(x) \wedge \exists x\, Q(x)$.

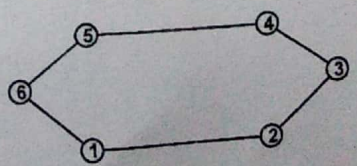
Are (i) and (ii) tautologies? **(12.5)**

Unit-II

Q4. a) Is H a subgraph of I shown in the following figure? Explain it. **(6)**



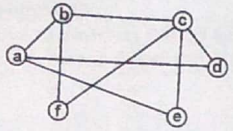
I



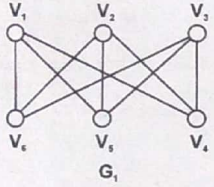
P.T.O.

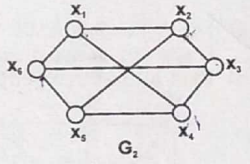
P 1/3

b) Define bipartite graphs. Verify whether following graph is bipartite or not. **(6.5)**



Q5. Show that the graph $G_1 = (V_1, E_1)$ and $G_2 = (V_2, E_2)$ are isomorphic.

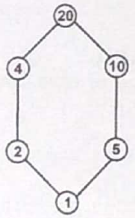




Unit-III

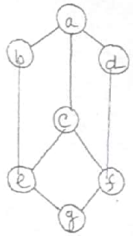
Q6. a) Consider a poset ({1,2,4,5,10,20},|) as described by Hasse diagram in the following. **(6)**

Fig.



Show that it is a lattice.

b) Let (L, ≤) be a lattice shown in the following figure where L= {a,b,c,d,e,f,g}. Define an algebraic system on A. **(6.5)**



Q7. a) IN Q 6a, consider the following subset of lattice **(6)**
i) S= {2,4,10,20}
ii)S={4,5,10,20,}
iii) S= { 1,2,5,10}

Determine whether the above subset of the lattice is a sublattice.

b) Define distributed and complemented lattices. In Q 6a, find the complement the element 4. Is the lattice given in Q6a complemented lattice. **(6.5)**

Unit-IV

Q8. a) Let A = B=R the set of real numbers. Let f: A→B be given by the formula $f(x)=4x^5-1$ and let g: B→A be given by $g(y)=\left(\frac{(y+1)}{4}\right)^{\frac{1}{5}}$. Show that f is bijection and g is also bijection. **(6)**

b) Let R be the set of real number and let f:R→R be defined by $f(x)=x^4$. Is f invertible? **(6.5)**

Q9. a) *Let* $u=\{x/x \in Z^+,\ x\leq 9\}$, $A=\{1,3,5,7\}$, $B=\{2,4,6\}$ $C=\{1,2,3,4\}$. *Find (i)* $(AUC)-B$ *(ii)* $\overline{AUB}$ *(iii)* $(\overline{A}\,\overline{UB})$ **(6)**

b) Prove the following: **(6.5)**
i) $(\overline{AUB})= \overline{A}\cap\overline{B}$ ii) $\overline{A\cap B}= \overline{A}\cup\overline{B}$

****

(Please write your Exam Roll No.) Exam Roll No. .....

END TERM EXAMINATION

SECOND SEMESTER [BCA] MAY-JUNE 2018

Paper Code: BCA 104 **Subject: Principles of Management**

Time : 3 Hours **Maximum Marks :75**

Note: Attempt any five questions including Q. NO. 1 which is compulsory.

Q1. Answer the following: **(5x5=25)**

a) Levels of management
b) Process of Decision Making
c) Skills of a Manager
d) McGregor's Theory X & Y
e) Type of control

Q2. Discuss the meaning, scope & functions of management in detail. **(12.5)**

Q3. Explain 14 principles of Fayol and explain their relevance to the field of management. **(12.5)**

Q4. Discuss the process of planning in detail. Explain the different types of planning. **(12.5)**

Q5. Explain the concept of decision making and its process in detail. **(12.5)**

Q6. Write short notes on:

a) Staffing and its importance **(2.5)**
b) Departmentation, Authority & Responsibility **(5)**
c) Styles of leadership. **(5)**

Q7. Explain the Herzberg's Two factor Theory of Motivation & Maslow's Need Heirarchy Theory. **(12.5)**

Q8. Explain the concept of Organizational Behaviour. What are the elements of it that are important to understand Human Behaviour & Problems? **(12.5)**

Q9. What is Personality? How is it different from perception? **(12.5)**

****

P

(Please write your Exam Roll No.) *Exam Roll No. .....*

END TERM EXAMINATION

SECOND SEMESTER [BCA] MAY-JUNE 2018

Paper Code: BCA106 ***Subject: Digital Electronics***

Time : 3 Hours ***Maximum Marks :75***

Note: Attempt any five questions including Q.no.1 which is compulsory. Select one question from each unit.

Q.1 Attempt all the questions:- **(5x5=25)**

(a) Why are NAND and NOR gates known as universal gates? Implement half adder circuit using NAND gates only.

(b) Define the terms for digital circuits:
(i) Speed of operations, (ii) Figure of Merit (iii) Noise margin.

(c) What is De-multiplexer? Explain the difference between MUX and DEMUX.

(d) What is the major disadvantage of SR flip-flop? How is this addressed in JK Fip-Flop?

(e) Explain ripple counter. What's the difference between ripple counter and synchronous counter?

Unit-I

Q.2 (a) Explain deMorgan's theorem. Prove the following using De Morgan's theorem: **8.5**

(i) $AB + CD = \overline{\overline{AB}.\overline{CD}}$ and (ii) $(A+B).(C+D) = \overline{\overline{(A+B)} + \overline{(C+D)}}$

(b) Implement EX-OR and EX-NOR gate using only NOR gates **4**

Q.3 (a)Explain the term "logic family". Compare RTL and TTL logic. **3**

(b)Simplify the following expression using K-map: **5**

$Y=m_0+m_1+m_3+m_7+m_8+m_9+m_{11}+m_{15}$

(c) Prove the relationship:

(i) $\overline{A}.B.C + A.\overline{B}.C + A.B.\overline{C} + A.B.C = A.B + B.C + CA$ **3**

(ii) $A.\overline{B} + A.B + B.C = A + B.C$ **1.5**

UNIT-II

Q.4 (a) Explain even parity and odd parity. Design a circuit for even parity generator for 3-bit message. **5.5**

(b) Show block diagram of a 3 bit parallel binary adder. **3**

(c) Explain the binary multiplication method using the example (1010x1011) **4**

Q.5 (a) Implement the expression using a multiplexer **6.5**

$f(A,B,CD) = \sum m(0,2,3,6,8,9,12,14)$

(b) Design a 3:8 decoder using basic logic gates. **6**

Unit III

Q.6 (a)Design a S-R latch using 2-input NOR gates **3**

(b) Explain (a) J-K Flip-Flop can be converted to T Flip-Flop, (b) race around condition. **7.5**

(c) Explain master-slave flip-flop **2**

Q.7 (a) Justify the statement: "J-K Flip-Flop is a universal Flip-Flop. **5.5**

(b)Explain the advantage of SIPO over SISO. Discuss their applications. **4**

(c) What is Bi-directional Flip-Flop? **3**

P.T.O.

P 1/2

Unit-IV

Q.8 (a)How ripple counter works? **2.5**

(b)Show state diagram of 3 bit up/down counter. Design 3 bit up/down counter using T flip-flop. **7.5**

(c) Define ring counter **2**

Q.9 Write short notes on any two of the following: **(6.25x2=12.5)**

(i) RAM & ROM

(ii) PLA

(iii) Modulo counters

****

P.T.O.

(Please write your Exam Roll No.) Exam Roll No. .....

END TERM EXAMINATION

SECOND SEMESTER [BCA] MAY 2018

Paper Code: BCA 108 **Subject: Data Structure Using C**

Time : 3 Hours **Maximum Marks :75**

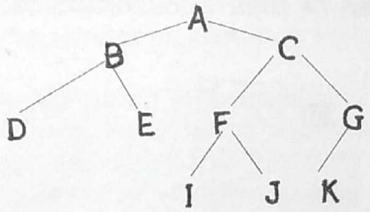
Note: Attempt any five questions including Q. NO.1 which is compulsory. Select atleast one question from each unit.

Q1. a) Define data structures. In how many ways can you categorized data structures? Explain each of them.

b) Perform selection sort on the following values
6, 55, 11, 10, 18

c) Convert the following infix expression into postfix expression.
(A*B-C/D)+H

d) Write the postorder traversal of the following tree.



e) Explain the difference between a circular linked list and a singly linked list. **(5x5=25)**

Unit-I

Q2. a) Write a short note on different operations that can be performed on data structures. **(4.5)**

b) Evaluate the following postfix expression using stacks. **(8)**
320, 10, *, 10, 60, 100, +, *, /

Q3. a) Explain why circular queue is better than linear queue? Give examples. **(4.5)**

b) Discuss D-queues and priority queues. What are the applications of stacks, queues, D-queues and priority queues? **(8)**

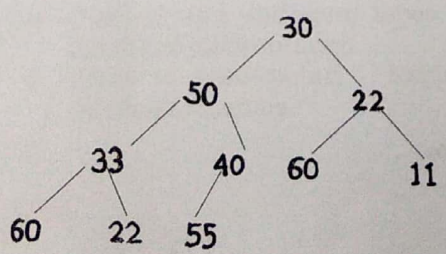
Unit-II

Q4. a) Write a function to insert a node at the beginning of single linked list. **(4.5)**

b) Write a function to delete a note from the end of double linked list. **(8)**

Q5. a) A binary tree T has 09 nodes. The inorder & preorder traversals of T yield the following sequences of nodes. **(4.5)**
Inorder: D G B A H E I C F
Preorder: A B D G C E H I F.
Draw the tree T

b) Consider the following binary tree T with with N=10 nodes. What is the inorder traversal of the tree? **(8)**



P.T.O.

P1/2

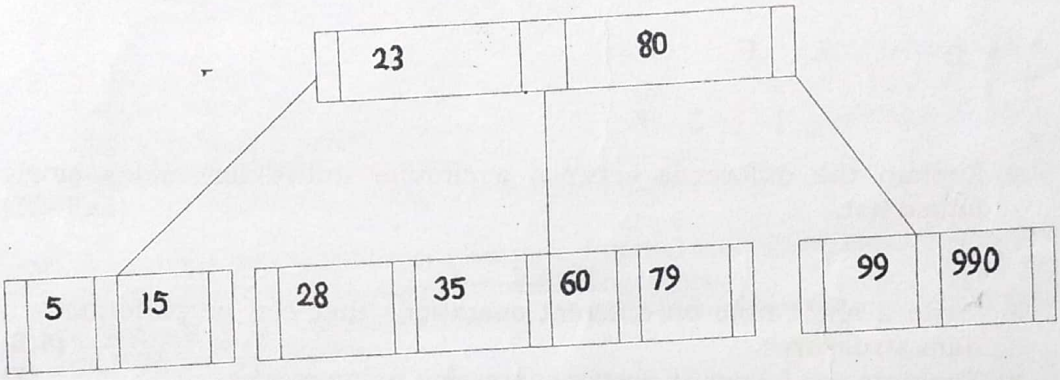
Unit-III

Q6. a) Construct B-tree of order 3 by inserting the following keys in the order shown. 18, 19, 6, 10, 40, 45, 5, 8. **(4.5)**

b) Construct Binary Search Tree of the following keys in the order shown.
1, 2, 3, 15, 8, 25, 7, 9 **(8)**

Q7. a) Construct an AVL search tree of the following values: **(4.5)**
11, 20, 23, 5, 3, 7, 9, 6

b) Insert the following values in the order of their occurrence 32, 34 in the given B tree of order 5. **(8)**



Unit-IV

Q8. a) Define hashing. Why do we use hashing? Discuss any two hashing methods with example. **(4.5)**

b) Which searching technique is best and under what conditions? Justify your answer with the help of an example. **(8)**

Q9. a) Explain merge sort with example. **(4.5)**

b) Which sorting technique is better and why? Explain with an example. **(8)**

****

P/2/2

(Please write your Exam Roll No.) Exam Roll No. .....

END TERM EXAMINATION

SECOND SEMESTER [BCA] MAY 2018

Paper Code: BCA 110 **Subject: Database Management System**

Time : 3 Hours **Maximum Marks :75**

Note: Attempt any five questions including Q. No.1 which is compulsory.

Q1. Answer the following: **(5x5=25)**

a) Draw and explain the architecture of DBMS. Compare it with file system.
b) Explain the role of E-R model in database design.
c) How can the two tables be joined using left outer and right outer joins?
d) What problems are encountered if data is not stored in normalized table?
e) List the problems associated with two phase locking protocol.

Q2. a) Discuss the advantages and disadvantages of DBMS. **(6.5)**
b) Why is relation database approach better than earlier methods? **(6)**

Q3. a) Construct an E-R diagram for a hospital management system with a set of doctors and a set of patients. With each patient, a series of various tests and examinations are conducted. On the basis of preliminary report patients are admitted to a particular specialty ward. **(6)**
b) Construct appropriate tables for the above E-R diagram. **(6.5)**

Q4. a) Explain the differences among external, internal and conceptual schemas. **(4.5)**
b) Related with database, explain the following terms: **(8)**
i) Data integrity ii) Concurrency iii) Data independence
iv) Referential integrity

Q5. Consider the following relational schema: **(2.5x5=12.5)**
Emp (empno, ename, job, sal, comm., hiredate, deptno)
Dept (deptno, dname, location)

Give an expression in SQL for the following Queries:

a) Find the names of employees who work in deptno 10 and 20.
b) Increase the salary by Rs 1500 for the employees who are 'CLERK'.
c) Display the details of employees who work in same deptno as of the employee 'SMITH'.
d) Create the table Dept.
e) Display total salary of employees of each deptno and display those deptno whose total salary is more than Rs. 30000.

Q6. Differentiate between: **(2.5x5=12.5)**

a) Primary Key and Foreign Key
b) View and Indexes
c) Serializable and non serializable transactions
d) 2NF and 3CNF
e) Data and Metadata

Q7. a) Explain the CODD's rules of RDBMS. **(6)**
b) Discuss the timestamp ordering techniques for concurrency control. **(6.5)**

Q8. a) Discuss the different types of transaction failures that may occur in database environment. **(5)**
b) What is checkpoint? Explain the different recovery techniques when database crashes. **(7.5)**

****

P1