Time: 3 Hrs.   Max Marks: 75

SECTION- A (4 X 15 = 60 M)
Answer ALL Questions

1. a) Explain how developments in software and hardware have happened over generations with time. Justify Moores Law.   (15)

(Or)

   b) Explain the working of input and output units of a computer and their applications

   If a page has 1200 characters, how many bits are needed to store it in a bit mapped form? How many bits are needed to store it in ASCII?   (15)

2. a) Explain operators available in C, their precedence and associativity with examples. Give an example C Program to illustrate how improper use of operators will result in the generation of logical error.   (15)

(Or)

   b) Explain input and output statements without formatting and with formatting. Give examples.   (15)

3. a) Write a C Program using user defined functions and library functions to (i) concatenate two strings (ii) extract a substring from a string (iii) replace a substring (iv) find the length of a string   (15)

(Or)

   b) Write a C program to (i) find the smallest in an array of n elements using pointer arithmetic (ii) check orthogonality of a matrix.   (15)

4. a) Write a C program to process the internal and semester end marks of MCA I Semester students and display the result. Calculate SGPA. Overall result status should be Pass or Fail as per the conditions stipulated by the university.

(Or)

   b) Write a C program to process sequential and random access files.   (15)

5.a) What is the octal equivalent of the decimal fraction 0.374? Give decimal equivalent of octal number 362.

b) Write short notes on functions of OS.

C) What are the similarities and differences between tc++ and gcccompilers? Give the commands used in running a sample program using them.

d) Write a C Program to find whether a number is positive, negative or zero using simple if, if..else.

e) Write a C program using *break* to generate the output 1 A 2 B 3 C. Use *continue* to generate the output 1 A 2 3 C.

f) Writea C Program to find the cube of a number using a) macro and b) function

g) Explain the differences between malloc(), calloc() and realloc() in terms of the functions they perform.

h) What is conditional compilation? What are its benefits?

ADIKAVI NANNAYA UNIVERSITY, RAJAMAHENDRAVARAM
MCA I Semester
1.2 DATA STRUCTURES
MODEL QUESTION PAPER

Time: 3 Hrs.   **Max Marks: 75**

SECTION –A(4×15 =60 M)
Answer ALL Questions with internal choice

1.   a)   Define data structure and explain Stack applications with an example   (7M)
      b)   Write ADT operations for array implementation of a queue   (8M)
                              (OR)
      c)   Explain implementation of priority queue   (7M)
      d)   Write a c program to implement operations of circular linked list   (8M)

2.   a)   Define Binary Tree and explain traversals binary tree with examples   (7M)
      b)   Explain Threaded Binary Trees and their applications with examples   (8M)
                              (OR)
      c)   Construct a Binary Search Tree from the given values 45, 23, 29, 85, 92, 7, 11,35, 49,
            51?   (7M)
      d)   Write a C program to implement the operations of Binary Search Tree   (8M)

3   a)   Explain Radix sort and Heap sort methods in Detail   (8M)
      b)   Write a C Program to implement Quick Sort   (7M)
                              (OR)
      c)   Define Searching explain with an example   (8M)
      d)   Write a C Program to implement binary search with an example   (7M)

4   a)   Define Hashing and explain open addressing with an example   (8M)
      b)   What is Collision? What are the different Collision resolving techniques with
            example   (7M)
                              (OR)
      c)   Define a Graph explain Graph traversal techniques with an example   (15M)

SECTION –B (5×3 =15 M)

5.   *Answer any FIVE Questions of the following.*
   a)   Explain about Stack applications
   b)   Explain about doubly linked list
   c)   Write the applications of binary trees
   d)   Explain about Huffman Algorithm
   e)   Explain the procedure for selection sort
   f)   Explain about B+ Trees
   g)   Explain about the representation of graphs
   h)   Explain about the Dynamic Hashing

ADIKAVI NANNAYA UNIVERSITY, RAJAMAHENDRAVARAM
MCA I Semester
1.3 DISCRETE MATHEMATICAL STRUCTURES
MODEL QUESTION PAPER

Time:3 hrs.   **Max.Marks: 75**

SECTION- A (4 X 15 = 60 M)
Answer ALL Questions

1(a) Show that $p \rightarrow q$ and $\neg q \rightarrow \neg p$ are logically equivalent.   (7M)

  (b) Show that the relation $\leq$(less than or equal to) defined on the set of positive integers Z^+ is a partial order relation.   (8M)

(or)

(c) S.T $R \wedge (P \vee Q)$ is a valid conclusion from the premises $P \vee Q$, $Q \Rightarrow R$, $P \Rightarrow M$ and $\neg M$.   (7M)

(d) If R be a relation in the set of integers z defined by R = {(x,y)/:x$\in z, y \in z$, (x-y) is divisible by 6}.

(8M)

2(a) Solve the recurrence relation $a_n = a_{n-1} + 2,\ n \geq 2$ subject to initial condition $a_1 = 3$ (7M)

(b)How many ways are there to assign five different jobs to four different employees if every employee is assigned atleast one job?   (8M)

(or)

(c) Applyingpegion hole principle show that of any 14 integers are selected from the set

S= {1,2,3,….,25} there are atleast two whose seem is 26.Also write a statement that generalizes this result.   (7M)

(d) In a class of 25 students, 12 have taken mathematics. 8 have taken mathematics but not biology.Find the number of students who have taken mathematics and biology and those who have taken biology but not mathematics.   (8M)

3(a) If G= (V,E) be a directed graph with e edges , then $\sum_{v \epsilon V} deg_G^+ (V) = \sum_{v \epsilon V} deg_G^- (V) = $ e   (7M)

(b)Show that C_6 is a bipartite graph.   (8M)

(or)

(c) Show that the complete graph K_n has a Hamiltonian cycle.   (7M)

(d)Prove that a tree with n vertices has n-1 edges.   (8M)

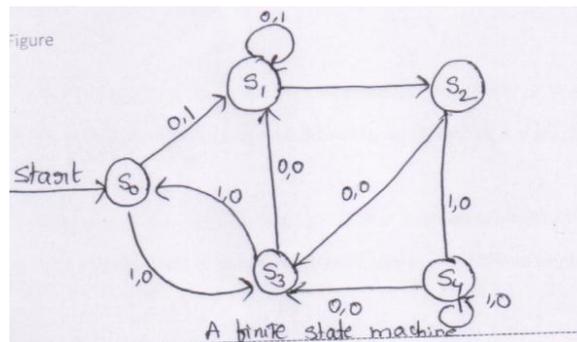4. (a)Find the sum of products expansion for the function $F(x, y, z) = (x + y)\bar{z}$ (7)

(b) Construct circuits that produce the following outputs (i)$(x + y)\bar{x}$ (ii)$\bar{x}(\bar{y + \bar{z}})$ (8)

(or)

(c) Show that distributive law $x(y + z) = xy + xz$ is valid (7)

(d)Construct the state table for the finite state machine with the state diagram shown in the following

Figure (8)

A finite state machine

SECTION-B(5*3=15M)

5.Answer any Five Questions of the following

a.Construct the truth table for $p \wedge (\sim q \vee q)$

b.Write the following in symbolic form

Every person is precious.

c. Compute $\frac{20!}{18!}$

d.Prove $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

e.State and prove Hand shaking theorm

f.Define Hamilton circuit Hamiltonian graph give examples to each

g.Find the duals of $x(y + 0)$ and $\bar{x}.1 + (\bar{y} + z)$

h. Let A= {1,00} , find A^n for n= 0,1,2 and 3

ADIKAVI NANNAYA UNIVERSITY - RAJAMAHENDRAVARAM
MCA I -Semester
1.4 COMPUTER ORGANIZATION
MODEL QUESTION PAPER

Time: 3 Hrs   **Max Marks: 75**

SECTION- A(4 X 15 = 60 M)
Answer ALL Questions

1. a) What is Flip-Flop? Explain various types of Flip-Flop.   15M

                            (Or)

     b) Write about Decoder and Multiplixers and also Construct 8 to 1 Line multiplexers   15M

2. a) Explain Data types,Complements and fixed –point representation.   15M

                            (Or)

     b) Draw and Explain 8085 microprocessor Architecture.   15M

3. a) Describe the mechanism of an instruction cycle and memory reference instructions.   15M

                            (Or)

     b) Explain instruction formats and addressing modes   15M

4. a) Write about Asynchronous data transfer methods and Explain DMA transfer with block diagram.   15M

                            (Or)

     b) What is the difference between main memory and Auxiliary memory and Explain the mapping process of Cache memory.   15M

SECTION – B(5 X 3 = 15 M)
Answer any FIVE of the following

5. a) Logic Gates.

 b) Registers and memory unit.

 c) Floating point representation.

 d)Arithmetic microoperations.

 e)Timing and Control.

 f)Stack organization.

 g) I/O interface.

 h) Virtual memory.

ADIKAVI NANNAYA UNIVERSITY - RAJAMAHENDRAVARAM
MCA I -Semester
1.5 MANAGEMENT ACCOUNTANCY
MODEL QUESTION PAPER

Time: 3 Hrs   **Max Marks: 75**

SECTION- A(4 X 15 = 60 M)
Answer ALL Questions

1. a) Define Accounting Process? Explain various Branches of Accounting.   [15]
        (OR)
    b) Give detailed proforma for Trading A/C, P&L A/C and Balance Sheet.   [15]

2. a) What do you mean by financial statement analysis? Explain the importance of Ratio
        analysis in analyzing the financial strength of an organization?   [15]
        (OR)
    b) Distinguish between Funds flow and cash flow analysis   [15]

3. a) Explain the nature and importance of budgets and budgetary control in planning and
        coordinating the functional activities of an organization?   [15]
        (OR)
    b) Calculate P/V ratio ,BEP and Margin of Safety from the following data of a
        manufacturing
        Enterprise.
        Selling price   10 Rs
        Variable Cost   6 Rs
        Fixed Cost   40,000 Rs
        Actual Sales   16,500 Units   [15]

4. a) What are the various types of documents used for data collection in computerized
        accounting system?   [15]
        (OR)
    b) Explain the importance of coding logics in computerized accounting system? [15]

SECTION – B (5×3=15 Marks)
Answer any five Questions

5. a) Double entry system
    b) Closing entities
    C) Liquidity ratios
    d) Working Capital Cycle
    e) Master Budget
    f) Assumptions of Break even analysis
    g) Transaction files
    h) Flexibility budget