**MCA (SEM-I)**
*Programming with C*
**(OCT-16)**

QP CODE : 510000

[Total Marks : 100 ]

(3 Hours)

N.B. : 1. Question No.1 is **compulsory**

2. Attempt any **four** from the remaining **six** questions.

3. Give **Programming examples** and **syntax** where **required**.

1. (a) Explain enum with suitable example. (10)

   (b) What do you mean by Recursion? Write a program to find n! (10) using recursive function.

2. (a) Write any five string functions with suitable example for each. (10)
   (b) Write a C program for matrix multiplication using function. (10)

3. (a) Differentiate the following: (10)
      i. Structure and Union
      ii. Call by value and Call by reference.
   (b) Write a C program which accepts two file names as command (10) line parameters and append the second file to the first.

4. (a) Write a complete C program to simulate a digital clock. (10)
   (b) What are the storage classes? Explain with suitable example. (10)

5. (a) Write a program in C for returning starting location of a substring (10) using pointers.
   (b) Write a program to generate pattern: (10)
      ```
        1
       121
      12321
      1234321
      ```

6. (a) Write a C program to reverse the string. (10)
   (b) List and explain operators in C. Also write operator precedence. (10)

7. Write Short Notes on **_any four_** :- (20)
      a) Multidimensional array
      b) Pointers
      c) Stream file
      d) Preprocessors in C
      e) Escape Sequence

**N.B.:** (1) Question **no. 1** is **compulsory**

(2) Answer any **four** of the remaining **six** questions

(3) **All** questions carry **equal** marks

**1**

a) Draw data flow diagram (DFD) till second level, depicting various processes, data flow and data repositories and ER diagram for a "Study Centre Management System". (10)

b) What is feasibility study? Explain different types of feasibility studies. (10)

**2**

a) Describe the RAD and waterfall model. (10)

b) Describe the steps in SDLC model in details. (10)

**3**

a) What are structured walkthrough, how can they be carried out. (10)

b) Explain major threats in system security? Which are most serious .why? (10)

**4**

a) Compare and contrast white box testing and black box testing. (10)

b) Compare and contrast conventional testing and object oriented testing. (10)

**5**

a) Distinguish between validity and reliability .how are they related. (10)

b) Define output. What are the analyst's objectives in designing 10 outputs? (10)

**6**

a) What is implementation /how does it differ from conversion? Elaborate. (10)

b) Describe components of CASE tools, indicating the function performed by each. (10)

**7** Write short notes on the following(any four) (20)
   a) Warnier/Orr diagram
   b) Data dictionary
   c) Structure chart
   d) HIPO chart
   e) Decision tree

**********************

Note (1) Q1. is compulsory, attempt any four out of remaining six.
    (2) All question carry equal marks.
    (3) Answer to sub-questions should be grouped together.

| | | | |
|---|---|---|---|
| Q1. | (a) | Explain Full Adder with Logic diagram | 5 |
| | (b) | Define flip flop. Explain the working of SR FF with logic diagram. | 5 |
| | (c) | Simplify the Boolean function $F(a,b,c,d) = \sum(0,1,2,5,8,9,10)$ using four variable map in sum of product form. Also draw the circuit diagram of the simplified equation. | 5 |
| | (d) | Design a combinational logic circuit whose output is HIGH for odd number of 1's as input. Assume that input to the circuit is 3-bit A2 A1 A0. | 5 |
| Q2. | (a) | List and explain different addressing modes with suitable examples | 10 |
| | (b) | Explain system bus. Write different bus arbitration methods. | 10 |
| Q3. | (a) | Compare and contrast Interrupt Driven I/O, DMA and Programmed I/O. | 10 |
| | (b) | Explain fetch cycle, indirect cycle and interrupt cycle. With the help of a diagram | 10 |
| Q4. | | Difference the following | 20 |
| | | (a) Micro-Programmed and Hard wired Control | |
| | | (b) SRAM vs. DRAM | |
| Q5. | (a) | What is RAID? Explain any 3 RAID levels in detail with suitable diagrams | 10 |
| | (b) | What is an I/O Module? Discuss with the help of a diagram, the functioning of I/O module. | 10 |
| Q6. | (a) | Explain 4x1 multiplexer with the diagram. | 10 |
| | (b) | Define Cluster. Explain different clustering methods in detail. | 10 |
| Q7. | | Explain any two in details: | 20 |
| | | (a) PCI bus | |
| | | (b) Cache Memory | |
| | | (c) SMP | |

Duration 3 hours                                                                 Total 100 marks

N.B:   (1) Question No. 1 is compulsory.
       (2) Attempt any four out of remaining six questions.
       (3) Assume any necessary data but justify the same.
       (4) Figures to the right indicate marks.

1. a) (i) Obtain a disjunctive normal form of                                    [5]
        $P \lor (\neg P \to (Q \lor (Q \to \neg R)))$

(ii) Let S={1,2,3,4} and A=S×S. Define the following relation R on A.

       (a,b)R(a',b') if and only if $\dfrac{a}{b} = \dfrac{a'}{b'}$.

Show that R is an equivalence relation. Compute A/R                               [5]

b) (i) Determine whether the set of real numbers with a∗b=a+b+2 is a semigroup, a monoid or neither. If it is a monoid, specify the identity. If it is a semigroup or a monoid determine whether it is commutative.                                        [5]

ii) The solution of the recurrence relation $C_0 a_n + C_1 a_{n-1} + C_2 a_{n-2} = f(n)$ is $4^n + 5^n + 6$. Given that f(n)=30 for all n. Determine $C_0$, $C_1$, $C_2$.                                              [5]

2. a) (i) Use laws of logic to show the following equivalence. $(P \to Q) \land (R \to Q) \equiv (P \lor R) \to Q$.                                                                                            [5]

ii) What is functionally complete set of connectives. Explain with two examples.   [5]

b) Let A= { 1, 2, 3, 5, 6, 10, 15, 30} and R be relation defined by aRb if and only if "a divides b". Show that R is a partial order relation. Draw the Hasse diagram of (A, R).          [10]

3. a) (i) Using mathematical induction to prove that $3^n + 2n - 1$ is divisible by 4 for every positive integer n.                                                                                  [5]

ii) Show that the hypothesis "If you send me e-mail message, then I will finish writing    [5]
      the program", "If you do not send me an e-mail message, then I will go to sleep early"
      and "If I go to sleep early, then I will wake up feeling refreshed", leads to the conclusion
      "If I do not finish writing the program then I will wake up feeling refreshed".

b) (i) Let the universe of discourse be D={0, 1, 2, …,9}. Let Q(x,y) be the statement "x+y=x-y". Determine the truth values of the following.

1

(1) Q(1,1),                    (2) $\exists y\ \forall x\ Q(x,y)$                    (3) $\forall y\ \exists x\ Q(x,y)$,

(4) $\exists x\ Q(x,2)$                  (5) $\forall x\ \exists y\ Q(x,y)$                                                        [5]
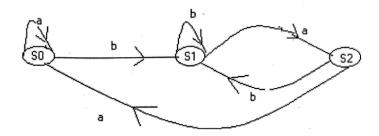
ii) Find the particular solution of   $a_n - 6a_{n-1} + 9a_{n-2} = (n+1) \times 3^n$                    [5]

4. a)(i) Use the method of homogeneous solutions to find a particular solution of recurrence
     relation $3a_n = 5a_{n-1} - 2a_{n-2} + n$ with initial condition $a_0 = -1$ , $a_1 = 1$                    [5]

ii) Let $a_n = \begin{cases} 0 & 0 \le n \le 2 \\ 2^{-n} + 3 & n \ge 3 \end{cases}$      Find $\Delta a_n$, where $\Delta$ denotes the forward difference.      [5]

b) Obtain the recurrence relation for the maximum number of regions of a plane when there are n
lines in the plane. Give suitable initial condition(s). Solve the recurrence relation.
                                                                                                          [10]

5 a) (i) Let G be a group and let a be a fixed element of G. Show that the function $f_a : G \to G$
defined by $f_a(x) = axa^{-1}$  for $x \in G$ is an isomorphism.                    [5]

ii) Consider the group G={1,2,3,4,5,6} under multiplication modulo 7. Find the multiplication
table of G.  Find the order of the subgroup generated by 3. Is G cyclic?                    [5]

b)(i) Let $H = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ be a parity check matrix.                    [5]

Determine the (3,6) group code $e_H : B^3 \to B^6$.

(ii)  Consider the group code defined by e: $B^2 \to B^5$ such that e(00)=00000, e(01)=01110,  [5]
      e(10)=10101, e(11)=11011. Decode the following word 10011 relative to maximum
      likelihood decoding function.

6. a) (i) Let the (2,9) encoding function e defined by                    [5]
        e(00) = 000 000 000   e(01) = 011 101 100
        e(10) = 101 110 001   e(11) = 110 001 111
be an associated maximum likelihood function. How many errors will (e,d) correct.

(ii) Construct the transition table of the finite state machine whose diagraph is shown.      [5]

b) (i) Let V={$v_0$, w, a, b, c} S={a, b, c} and let $\mapsto$ be the relation on V* given by                [5]

    1. $v_0 \mapsto aw$        2. $w \mapsto bbw$        3. $w \mapsto c$

Consider the phase structure grammar G=(V, S, $v_0$, $\mapsto$).
Derive the sentence $ab^4c$. Also draw the derivation tree.

(ii) Let the state transition table for a finite state machine be                [5]

|       | 0     | 1     |
|-------|-------|-------|
| $S_0$ | $S_0$ | $S_1$ |
| $S_1$ | $S_1$ | $S_2$ |
| $S_2$ | $S_2$ | $S_3$ |
| $S_3$ | $S_3$ | $S_0$ |

List values of the transition function $f_w$ for (a) w=01001, (b) w=11100.

7. a) Determine whether the relation R on a set A is reflective, irreflective, symmetric, asymmetric, antisymmetric or transitive. Give necessary explanation to your answer.
A= set of all positive integers, aRb iff GCD (a,b)=1                [10]

b) Perform the following.                [10]

      i) $(1011.110)_2 = (?)_{10}$

      ii) $(413)_8 = (?)_{10}$

      iii) $(1101)_2 - (1001)_2 = (?)_2$

      iv) $(1011)_2 \times (1010)_2 = ?$

      v) $(10100)_2 \div (100)_2 = ?$

**************

**N.B. 1. Question No.1 is compulsory**
     **2. Attempt any four from Question No. 2 to 7**
     **3. Answer to the questions should be grouped and written together**
     **4. Figures to the right indicates full marks assigned to the question**

| | | | |
|---|---|---|---|
| Q1 | a | Define and explain the elasticity of demand. What are the factors that affect it? | (10) |
| | b | What do you mean by Management? Explain the functions of management. | (10) |
| Q2 | a | What is demand forecasting? Explain the methods of demand forecasting. | (10) |
| | b | Discuss the scope and nature of managerial economics? What are the roles and responsibilities of managerial economist? | (10) |
| Q3 | a | What is break even analysis? What is BEP? Explain with suitable example. | (10) |
| | b | Explain Expert opinion method. | (10) |
| Q4 | a | Describe different market structures with suitable example. | (10) |
| | b | Write short note on : 1. Market Equilibrium      2. Cost Control and Cost Reduction. | (10) |
| Q5 | a | Explain decision making process in detail. | (10) |
| | b | Explain the 4 P's of marketing with suitable example. | (10) |
| Q6 | a | Explain Maslow's theory of motivation. | (10) |
| | b | Discuss the various types of interview techniques used in selection of employs. | (10) |
| Q7 | | Write short notes on any 4 | (20) |

         1. Delegation of authority

         2. Planning and its importance

         3. Performance Appraisal

         4. MBO

         5. Hawthorne Experiment

------------------------------

# MCA (SEM-I)
## Introduction to Web Technology
### (OCT-16)

Q.P. Code : 510501

Total Marks : 100

**N.B.** (1) Question No.1 is compulsory
(2) Answer any 4 of the remaining 6 questions
(3) Figures to the right indicate full marks

1. Attempt any FOUR questions
   a) Differentiate between GET and POST method. (20)
   b) Explain how an ASP page is executed?
   c) String object in JavaScript
   d) Block level tags in HTML.
   e) Explain any four tags within <TABLE> tag.

2. (a) Explain types of lists in HTML. Write HTML code to demonstrate it. (10)
   (b) Write a JavaScript to accept a number from user and check whether the number given is a Fibonacci number or not. (10)

3. (a) What is Event and Event handlers in JavaScript? Write JavaScript to demonstrate event handling in JavaScript. (10)
   (b) Explain Array as object in JavaScript with atleast four methods. (10)

4. (a) How many types of dialog boxes can be created using JavaScript? Write how to create them and about their usage. (10)
   (b) Explain Date object initialization in java script. Explain any two methods of Date object with example.. (10)

5. (a) Explain user defined objects and user defined functions in JavaScript along with example. (10)
   (b) What is CSS? Explain different types of CSS with example and advantages and disadvantages. (10)

6. (a) Explain Request and Response object used in ASP. (10)
   (b) What is the difference between Application and Session object? Explain with example. (10)

7. (a) Explain linking between frames along with example. Explain the advantages and disadvantages of Frames. (10)
   (b) What are Cookies? Explain along with example. What are the advantages of Cookies? (10)