M.C.A. (Sem - I)
Programming with C
(May-2017)

Q.P. Code :02322

[Time: Three Hours]

[Marks:100]

Please check whether you have got the right question paper.

N.B:
1. **Question.No.1** is Compulsory.
2. Attempt any 4 Questions out of remaining **Six** Questions.
3. Give programming examples and syntax where required

Q. 1 a) Write any five string functions with suitable example of each. **10**

b) Write a program to find even and odd numbers in given range. **10**

Q. 2 a) Differentiate between call by value and call by reference with suitable example. **10**

b) What is "Recursive Function"? Demonstrate Factorial by accepting number from the user. **10**

Q. 3 a) Discuss operations on pointer and pointer Arithmetic. **10**

b) Write a C program to write & read contents with respect to text file. **10**

Q. 4 a) Write a code to simulate a simple arithmetic calculator. **10**

b) What is escape sequence? Give example. **10**

Q. 5 a) Differentiate union and structure with example. **10**

b) Write a program to print Pascal's Triangle. **10**

Q. 6 a) Write a C program to accept 10 numbers entered by user, store it in an array and display these numbers in ascending order. **10**

b) List and explain operators in C. Also write operator precedence. **10**

Q. 7 Write Short Notes on ***any four:-*** **20**

a) Type Casting

b) Array of Structures

c) Macro

d) Preprocessors in C

e) Storage Classes.

Please check whether you have got the right question paper.

N.B:
1. Question **No.1** is **compulsory**.
2. Attempt **any four** out of remaining.
3. **All** question carry **equal marks**.

1. (a) Using K-maps, simplify the following simplify the following Boolean function : **5**

$$F(W, X, Y, Z) = \sum (0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$$

   (b) Explain Decodes and Encodes with suitable example. **5**

   (c) What are flip flops? Explain its types with states. **5**

   (d) Explain the working of J-k FF. Explain all its states. **5**

2. (a) Design a combinational logic circuit whose output is HIGH when input is > 9. Assume that input to the circuit is 4 bit binary A3 A2 A1 A0. **10**

   (b) Explain six stage instruction pipeline. Add a note on effect of conditional branching with suitable timing diagram. **10**

3. (a) Explain data flow in fetch cycle, indirect cycle and interrupt cycle with diagram. **10**

   (b) What is CPU? Explain instruction sets with its characteristics and functions. **10**

4. Difference between following (**any four**) : **20**
   (a) Interleaved vs Associative memory.
   (b) Sequential vs Combinational circuits.
   (c) Operands vs Operations.
   (d) RISC vs CISC.
   (e) Processor vs Register organization.

5. (a) Explain about various I/O transfer techniques. **10**
   (b) Describe Full-adder circuit (with truth table). **10**

6. (a) Explain the working of J-k FF. Explain its states and describe each with example. **10**
   (b) What is Cache Memory? Explain about different cache mapping mechanisms. **10**

7. Explain (**any two**) : **20**
   (i) 4 x 1 multiplexer.
   (ii) Parallel Organization : Clusters.
   (iii) Address : Half and Full.
   (iv) Computer functions and Interconnections.

_____

M.C.A. (Sem - I)
Discrete Mathematics
(May-2017)

Q.P. Code : 04487

[Time: 3 Hours]   [Marks:100]

Please check whether you have got the right question paper.

N.B: 1.   Question No. 1 is compulsory.
            2.   Attempt any four questions from Question No. 2 to 7.
            3.   Figures to right indicate marks.

1.   a)   i.   The Solution of the recurrence relation $C_0 a_{n-1} + C_2 a_{n-2} = f(n)$ is $2^n + 3^n + 5$. Given   **05**
                that $f(n) = 40$, for all n. Determine C_0, C_1, C_2.
          ii.   Using law of logic to show the following equivalence.   **05**
                $(P \rightarrow Q) \wedge (R \rightarrow Q) \equiv (P \vee R) \rightarrow Q$

     b)   Let A = A = {1,2,3,5,6,10,15,30}. Consider the relation R on A as aRb iff 'a divides b'.   **10**
          Show that R is partial order relation. Draw the Hasse diagram of the poset(A,R)

2.   a)   i.   Let S= {1,2,3} Let G = S_3 be the group of all permutations of elements of S, under the
                operation of composition of permutation. Let H be the subgroup formed by the two

                Permutations $\begin{pmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \end{pmatrix}$ and $\begin{pmatrix} 1 & 2 & 3 \\ 2 & 1 & 3 \end{pmatrix}$

                Find the left coset of H in G. Is H a normal subgroup? Explain your notion of   **05**
                composition clearly.
          ii.   Consider the (2, 6) encoding function e as follows.
                e(00) = 000000 e(01) = 011110   e(10) = 101010   e(11) = 111000
                How many errors will e detect?   **05**

     b)   1)   Let V = {v_0, w, a, b, c} S = {a, b, c} and let $\mapsto$ be the relation on V* given by
                $v_0 \mapsto aw$ w $\mapsto$ bbw   w$\mapsto$ c
                Consider the phase structure grammar G = (V, S, v_0, $\mapsto$). Derive the sentence   **05**
                ab^6c. Also draw the derivation tree.
          2)   Consider the group G = {1, 2, 3, 4, 5, 6} under multiplication modulo 7.   **05**
                i)   Find the multiplication table of G.
                ii) Find $2^{-1}, 3^{-1}$, and 6^{-1}.
                iii) Find the order of the subgroups generated by 2 and 3 .
                iv) Is G cyclic?

3.   a)   i.   Obtain Conjunctive and Disjunctive Normal Form of the following   **05**
                $(\sim P \vee \sim Q) \rightarrow (P \leftrightarrow Q)$
          ii.   Show that group G is abelian if and only if for a, b $\in$ G   **05**
                $(a * b)^2 = a^2 * b^2$

     b)   i.   Using Mathematical induction Prove that   **05**
                $1^3 + 2^3 + 3^3 + ... + n^3 = \dfrac{n^2 (n+1)^2}{4}$
          ii.   Find the solution of recurrence relation define by   **05**
                $a_n = 3 a_{n-1} - 2 a_{n-2}$ with $a_1 = 5$ and $a_2 = 3$.

[Turn Over]

4. a)   i.   Determine which of the form given below are tautology or contradiction.   **05**

$(P \rightarrow Q) \wedge (Q \rightarrow R) \rightarrow (P \rightarrow R)$

 ii.   Can we conclude S from the following premises? Justify.   **05**

$P \rightarrow Q, \quad P \rightarrow R, \quad \sim(Q \wedge R), \quad S \vee P$

 b)   i.   Construct the state transition table of the finite state machine whose digraph is   **05**
shown below
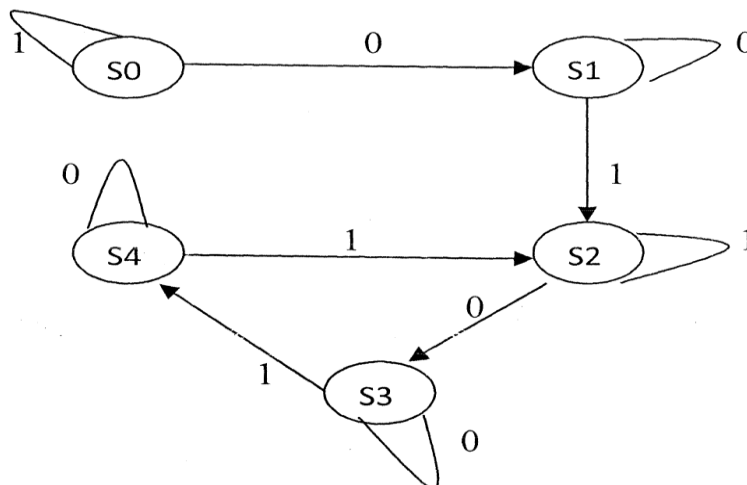
 ii.   What are quantifiers? Explain with suitable example.   **05**

5. a)   i.   Let T be set of even integers. Show that the semigroup (Z, +) and (T,+) are   **05**
isomorphic, were Z is a set of integers.

 ii.   Let the transition table for the finite state machine be   **05**

	0	**1**
S0	S0	S1
S1	S1	S2
S2	S2	S3
S3	S3	S0

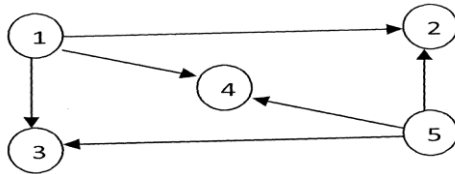List values of transition function f_w for w = 11100

 b)   i.   Determine whether the set of even integers with a*b = ab/2 is a semigroup, a   **05**
monoid or neither. If it is monoid, specify the identity. If it is a semigroup or monoid
determine whether it is commutative.

   05

 ii.   Let H = $\begin{pmatrix} 1 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$ be a parity check matrix

Determine the corresponding (3, 6) group code $e_H = B^3 \rightarrow B^6$.

[Turn Over]

3

6. a) i. State the "Tower of Hanoi" problem. Obtain the corresponding recurrence relation **05**
        indicating the conditions.
    ii. State and prove left and right cancellation property for a group. **05**

    b) i. Let A= {1,2,3,4} R={(1,2),(2,3),(3,4),(2,1)}. Find the transitive closure of R using **05**
        Warshall's algorithm.
    ii. Let C= {2,8,14,18}. Define a relation R by xRy iff x-y > 5. **05**
        Draw digraph of R, find M_R, M_R^T, M_R^{-1}.

7. a) Determine whether the relation R on a set A is reflective, irreflective, symmetric, **10**
        asymmetric, antisymmetric or transitive. Give necessary explanation to your answer,
        A= { 1,2,3,4,5}. The diagraph of the relation is

    b) Perform the following. **10**
        i. 10011 x 1101 = ?
        ii. $(01011.11)_2$ - $(01001.1)_2$ = $(?)_2$
        iii. 10001111 ÷ 1101 =?
        iv. $(22.23)_{10}$ = $(?)_2$
        v. $(254)_8$ = $(?)_{10}$

_____

M.C.A. (Sem - I)
Principles of Economics and Management
(May-2017)

Q.P. Code :02523

[Marks:100]

N.B: 1. **Question No. 1 is compulsory.**
2. **Attempt any four from Question No. 2 to 7.**
3. **Illustrate answers with proper example wherever necessary.**

Q.1 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

Q.2 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

Q.3 a.   What is break even analysis? What is BEP? Explain with suitable examples.   10
b.   Explain Expert opinion method.   10

Q.4 a.   Describe different market structures with suitable examples.   10
b.   Write short note on : 1. Market Equilibrium 2. Cost Control and Cost Reduction.   10

Q.5 a.   Explain decision making process in detail.   10
b.   Explain the 4 P's of marketing with suitable examples.   10

Q.6 a.   Explain Maslow's theory of motivation.   10
b.   Discuss the various types of interview techniques used in selection of employees.   10

Q.7   Write short notes on any 4   20
1.   Delegation of authority
2.   Planning and its importance
3.   Performance Appraisal
4.   MBO
5.   Hawthorne Experiment

_____

1

M.C.A. (Sem - I)
Introduction to Web Technology
(May-2017)

Q.P. Code :07510

[Marks:100]

Please check whether you have got the right question paper.

N.B: 1. **Q**uestion No. is **compulsory**.
2. Answer any 4 of the remaining 6 questions.

1. a. Write HTML code to accept input from a user for registering a dance course portal. The required inputs First   10
Name, Last Name, Gender, Date of Birth, Contact Number, Batch Time.
b. Explain with suitable example what are cookies and its advantages.   10

2. a. What is CSS? Explain in detail and with suitable example the different types and applications of CSS.   10
b. What are the various types of lists in HTML?   10

3. a. Discuss the terms Webmaster and Browser.   10
b. What is the difference between HTML, DHTML and XHTML?   10

4. a. Using JavaScript write a function to print the Fibonacci series.   10
b. Discuss the Date Object in JavaScript with the five different methods.   10

5. a. What are the different ways to store data in a persistent manner? Explain any two ways with the help of   10
program.
b. What is the difference between,   10
   1.   GET and POST method.
   2.   Client side scripting and Server side scripting

6. a. Write a JavaScript program to print this pattern.   10

```
      *
     **
    ***
   ****
  *****
```

b. Explain with suitable example array as a built in object.   10
7.   Write Short Notes on any four:-   20
       a.   Request object
       b.   Response Object
       c.   Cookies
       d.   Math Object in JavaScript
       e.   Static and Dynamic Web Pages.

M.C.A. (Sem - I)
System Analysis Design
(May-2017)

(3 Hours)

QP CODE : 510101

[Total Marks : 100]

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) Construct an ER diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted. Document all assumptions that you make about the mapping constraints   10
(b) Explain various fact finding techniques   10

2. (a) Compare Spiral Model and Waterfall Model and explain when to use each   10
(b) Explain the importance of Input and Output design   10

3. (a) What is Structured Walkthrough? Explain its need   ว
(b) Explain different types of documentation   1

4. (a) What is SRS? Explain the role of system analyst in it   1.
(b) Explain the strategic approach to software testing   1ᴄ

5. (a) Explain Structure chart and its types   10
(b) Explain different activities of implementation and support phase   10

6. (a) Explain different Extreme Programming practices and principles   10
(b) With the help of an example explain Hipo chart and Warnier Orr diagram   10

7. Write short notes on (any four):-   20

(a) Black box testing

(b) Normalization

(c) SDLC

(d) Decision tree vs. Decision Table

(e) Cost benefit analysis

****

DF85B2CAF8DDC703193679392A1C6DA3