M.C.A (Sem – I)
Programming with "C"
April - 2015

QP Code : 19392

M.C.A. (Sem - I) April-2015

(3 Hours) [Total Marks: 100]

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.**
(4) Answers to the questions should be grouped and written together.

1. a) What do you mean by Recursion? Write a program which will accept two numbers n and r and calculate value of nCr = n! / (n-r)!. Program should make use of recursion. 10
   b) Write a program to check whether the given number is palindrome or not. 10

2. a) What are the different Storage Classes supported by C language? Compare and contrast. 10
   b) Write a program to convert number into words. (123 = one two three) 10

3. a) What is a array? Explain how is it different from structures and unions? 10
   b) Write a program to display Fibonacci series by using recursive function. 10

4. a) Write a program for matrix multiplication using functions. 10
   b) Write a program to count tabs, no. of lines, characters, blank spaces from a file. 10

5. Write a program to generate patterns: 10

a.1)
```
        1
      1 2 1
    1 2 3 2 1
  1 2 3 4 3 2 1
1 2 3 4 5 4 3 2 1
```

a.2)
```
      *
     * *
    * * *
   * * * *
  * * * * *
   * * * *
    * * *
     * *
      *
```

b) Write the difference between: 10

(i) Malloc ( ) and Calloc ( ) (ii) Call by Value and Call by Reference

6. (a) Discuss various String operations possible in C language. 10

(b) Write a program to swap contents of two variables a and b 10

(i) Without using third variable (ii) using pointer variable

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

a) Actual Parameter and formal parameter

b) Relational Operators

c) Symbolic Constants

d) Nested If – else statement

e) enum

M.C.A (Sem – I)
System Analysis Design
April - 2015

(3 Hours) **Max. Marks : 100**

N.B. : (1) Question No. 1 is compulsory.
(2) Answer any four questions out of the remaining six questions.
(3) All questions carry equal marks

Q.1) (a) Automated teller machine (ATM) having a magnetic strip reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelops, a dispenser for cash (in multiples of Rs.100), a printer for printing customer receipts, and a key-operated switch to allow an operator to start and stop the machine. The ATM will communicate with the bank's computer over an appropriate communication link. The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) and amount both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions. For the above system draw CLD, DFD up to second level, and data dictionary. **[10]**

(b) Explain various fact finding techniques. **[10]**

Q.2) (a) What is cost benefit analysis? Write any two methods of performing cost benefit analysis. **[10]**

(b) Explain how prototyping can be used to augment the traditional systems development life cycles. **[10]**

Q.3) (a) Under what circumstances or for what purpose would one use an interview rather than other data collection methods? **[10]**

(b) Which is the most important and serious system security, why? **[10]**

Q.4) (a) Define graphical user interface. What is the key difficulty they present for programmers? **[10]**

(b) Explain Decision table and Decision tree. **[10]**

Q.5) (a) What is the purpose of system study? Define the different phases of it. **[10]**

(b) Explain in the different phases of SDLC what are the roles of the system analyst? **[10]**

Q.6) (a) Discuss the six special system test. **[10]**

(b)What is normalization? What is the purpose of normalization? Illustrate the method of normalization of database. **[10]**

Q.7) Write short notes on (any four): **[20]**

(a) Waterfall Model
(b) HIPO chart
(c) Debugging
(d) List of Deliverables
(e) Structure chart

DH-Con. : 9193-15.

M.C.A (Sem – I)
Computer Organization and Architecture
April - 2015

QP Code : 19397

(3 Hours) M.C.A. (Sem - I) April-2015

Total Marks: 100

1. Q1 is compulsory

2. From Q2 to Q7 answer any four

3. All questions carry equal marks

Q1

a) What are flip flops? Explain the types with all their states (8)
b) What is decoder. Design a 3x8 decoder. (7)
c) Using K-map, simplify the following Boolean function.
$F(w,x,y,z) = \sum (0,1,2,4,5,6,8,9,12,13,14)$ (5)

Q2.

A. Explain RISC and CISC architectures in detail. (10)
B. Explain six stage instruction pipeline . Explain the effect of conditional branching with suitable timing diagrams (10)

Q3.

A. Explain in detail about instruction cycle state diagram. (10)
B. Explain different RAID levels in details (10)

Q4.

A. Explain data flow in fetch cycle, indirect cycle and interrupt cycle along with suitable diagrams. (10)
B. What is cache memory? Explain about different cache mapping mechanisms

Q5.

A. What is addressing mode?. Explain its types in detail (10)

B. Explain about the Flynn's classification of SMPs with suitable diagrams (10)

Q6.

A. Explain in detail about the different superscalar instruction issue policies (10)
B. Explain about various I/O transfer techniques (10)

Q7.

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 the following (Any two) (10)

(i) Micro-Programmed and Hard wired control
(ii) Sequential vs Combinational circuits
(iii) 4x 1 Multiplexer

(iv) Full-adder circuit(with truth table)

DH-Con. : 9676-15.

M.C.A (Sem – I)
Discrete Mathematics
April - 2015

QP Code : 19401

(3 Hours) **Marks: 100**

N.B (1) Question No1 is compulsory.
(2) Attempt any four questions out of remaining six questions.
(3) Figures to the right indicate full marks.
(4) Use of scientific calculator is allowed.

1. (a) i) Obtain the disjunctive normal form of $P \wedge (P \rightarrow Q)$ — 5

ii) Let S={1,2,3,4} and let A=SXS . Define a relation R on A: (a,b)R (a',b') iff a+b = a'+b'.Show that R is an equivalence relation on A .Determine A/R. — 5

(b) i) Determine whether the set S ={ 1,2,3,6,9,18} where a*b=L.C.M (a,b) is a semigroup, a monoid or neither. If it is a monoid specify the identity. If it is a semigroup or a monoid specify whether it is commutative. — 5

ii) The solution of the recurrence relation $C_0a_n + C_1a_{n-1} + C_2a_{n-2} = f(n)$ is 3^n+4^n+2. Given that f(n)=6 for all n. Determine C_0, C_1 and C_2 . — 5

2. (a) i) Determine whether the given expression is a contradiction or tautology or neither
$(Q \wedge P) \vee (Q \wedge \neg P)$ — 5

ii) What are quantifiers? Explain with suitable examples — 5

(b) Let X = {1, 2,3,6,12,18} and the relation $\leq$ be such that "x divides y" .Show that $\leq$ is a partial order relation .Draw the Hasse diagram of f(X,$\leq$). — 10

3. (a) i) Using mathematical induction show that $1+3+5+....+(2n-1) = n^2$ for all $n \geq 1$. — 5

ii) Is the following argument valid? Justify. — 5
If Ram has completed M.C.A or M.B.A, then he is assured a good job. If Ram is assured a good job, he is happy. Ram is not happy .So Ram has not completed M.C.A.

(b) i) P(x) :x is a person
F(x,y) :x is the father of y
M(x, y) : x is the mother of y. Write the predicate for "x is the father of the mother of y". — 5

ii) Determine whether the sequence $\{a_n\}$ is a solution of the recurrence relation $a_n=2a_{n-1}-a_{n-2}$ for n=2,3,4..., where $a_n=2n$ for every non-negative n. — 5

4. (a) i) Find the particular solution of $a_r - 5a_{r-1} + 6a_{r-2} = 1$. — 5

ii) Use back tracking method to find the solution of the recurrence relation $b_n=2b_{n-1}+1$,where $b_1=7$. — 5

(b) State the "Tower of Hanoi" problem and obtain the corresponding recurrence relation indicating the suitable initial conditions. Solve the recurrence relation obtained. — 10

5. (a) i) Let G be a group .Show that the function f:G->G defined by $f(a)=a^{-1}$ is an isomorphism iff G is abelian. — 5

ii) Prove that the identity element for a group G is unique. — 5

(b) i) Let H = — 5

$$\begin{pmatrix} 1 & 1 \\ 0 & 1 \\ 1 & 0 \\ 1 & 0 \\ 0 & 1 \end{pmatrix}$$

[TURN OVER

Be a parity check matrix. Determine (2,5) group code $e_H: B_2 \rightarrow B_5$.

ii) Decode the words 00111,10111 and 11001 relative to maximum likelihood decoding function using the above matrix. 5

6. (a) i) Consider the (2,4) encoding function e as follows: 5
e(00)=0000, e(01)=0110, e(10)=1011, e(11)=1100.How many errors will e detect?

ii) Consider the (3,6) encoding function e as follows. 5
e(000)=000000, e(001)=000110, e(010)=010010,e(011)=010100, e(100)=100101, e(101)=100011, e(110)=110111, e(111)=110001.Show that the encoding function e is a group code.

(b) i) Let $v=\{v_0,w,a,b,c\}$,S={a,b,c} and let $|\rightarrow$be the relation on V* given by . 5
1)v0 $|\rightarrow$aw 2) w$|\rightarrow$bbw 3)w$|\rightarrow$c. Consider the phase structure grammar $G=(G,S,v0, |\rightarrow)$.Derive the sentence ab^6c.Also draw the derivation tree.

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

	a	B	c
S0	S0	S0	S0
S1	S2	S3	S2
S2	S1	S0	S3
S3	S3	S2	S3

Draw the digraph of the machine .

7. (a) Determine whether the relation R on set A is reflexive, irreflexive ,symmetric ,asymmetric ,antisymmetric or transitive .Give explanation for your answer.A=set of all positive integers, aRb iff $a^2-b^2=4$. 10

(b) Perform the following 10

(i) $(11011.110)_2=(?)_{10}$
(ii) $(213)_8=(?)_{10}$
(iii) $(1101)_2-(1001)_2=(?)_2$
(iv) 1011 X1010=?
(v) 10100 X 100=?

M.C.A (Sem – I)
Principles of Economics and Management
April - 2015

Q.P. Code : 19404

(3Hours) **[Total Marks : 100**

N.B. : (1) Question **No.l** is **compulsory.**
(2) Attempt any **four** questions from remaining **six.**
(3) **All** question carry **equal marks.**

1. (a) Explain the role and responsibility of managerial economist ? **10**
1. (b) Explain different types of Organizational structure. **10**

2. (a) Define Decision Making. Explain the essential steps in decision making. **10**
(b) Explain Performance appraisal. **10**

3. (a) Explain cost control and cost reduction in detail. **10**
(b) Explain Product life cycle in detail. **10**

4. (a) Explain economy and diseconomy of scale. **10**
(b) Explain Herzberg theory of motivation. **10**

5. (a) Explain law of demand and law of supply. **10**
(b) Explain characteristics of leadership. **10**

6. (a) Explain importance and need for proper staffing. **10**
(b) Explain theory of X and Y. **10**

7. Write short note on (Any **four**) :- **20**
(a) Training
(b) Marketing mix
(c) Marketing research
(d) Delegation of authority
(e) Nature of planning

M.C.A (Sem – I)
Introduction to Web Technology
April - 2015

M.C.A. (Sem - I) **QP Code : 19407** April-2015

Marks: 100 Time: 3 hours

Note:
- Question 1 is compulsory
- Answer any 4 from the remaining 6 questions
- All questions carry equal marks

Q1 a) Differentiate between
i) Get and post method
ii) Client side scripting and server side scripting (10)

b) Write HTML code to accept input from a user for registering for a hobby class. Information includes Name, Age, Address, Preferred class, Preferred Time. (10)

Q2 a) Explain the differences between application object and session object in ASP. (10)

b) Differentiate between HTML, DHTML and XHTML. (10)

Q3 a) Write a JavaScript program to print the pattern
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5 (10)

b) Explain Date Object in JavaScript with at least five methods. (10)

Q4 a) Explain the terms Webmaster and Browser. (10)

b) Explain the different types of lists in HTML. (10)

Q5 a) What are the different ways to store data in a persistent manner? Explain any two ways in detail with the help of a program. (10)

b) Using form controls create a course registration form. (10)

Q6 a) Write a recursive function in JavaScript to print the Fibonacci series. (10)

b) Explain types of lists in HTML with a suitable example (10)

Q7 a) Explain in detail and with suitable examples the different types and significance of various types of CSS. (10)

b) What are Cookies? Explain with an example, the advantages of Cookies. (10)

DH-Con. 10801-15.