

M.C.A. (SEM-I)
PROGRAMMING WITH C
(MAY-2019)

/ Subject Code: 55801 / Programming with C

(3 Hours)

Total Marks: 100

- N.B.** (1) Question No. 1 is compulsory.
(2) Attempt any four from the remaining six questions.
(3) Figures to the right indicate full marks.

- Q.1 (a) What is recursion? Write a C program to Calculate sum of digits of an integer using a recursion. [10]
(b) What is Preprocessor & Assembler? Explain in detail. [10]
- Q.2 (a) Explain what is pointer? Explain with suitable example. [10]
(b) What is malloc () & calloc ()? Explain Difference between malloc () & calloc () with example. [10]
- Q.3 (a) What are static variable? Compare with standard local variable [10]
(b) What is an operator? Explain Different Types of operators used in C. [10]
- Q.4 (a) Explain all in-built string handling functions with example. [10]
(b) Difference between Pass by Value and Pass by reference. [10]
- Q.5 (a) What is Storage Class? Explain Types of Storage Class. [10]
(b) Explain Function with argument & no return value with one example. [10]
- Q.6 (a) Write a C program to copy content of one data file into another. [10]
(b) What is Array? Explain in detail with example [10]
- Q.7 (a) Write short Notes on: (Any four) [20]
a) Difference between strings and character arrays
b) Macro
c) Null Pointer
d) Properties of Algorithm
e) Compare While & do While loop

Time: 3 Hours

Total marks:100

- 1) Question number 1 compulsory
- 2) Answer any four questions out of remaining
- 3) All questions carry equal marks

- Q1
- a) Draw data flow diagram (DFD) till second level, depicting various processes, data flow and data repositories and ER diagram for a "food ordering system". 10
 - b) Explain various fact finding techniques 10
- Q2
- a) Explain the Six special system tests. Give examples 10
 - b) Compare and contrast conventional testing and object oriented testing. 10
- Q3
- a) Compare Spiral Model and Waterfall Model and explain when to use each 10
 - b) Describe the prototype model in details 10
- Q4
- a) Explain the need of Warnier Orr Diagrams and HIPO chart 10
 - b) Explain the importance of Input and Output design 10
- Q5
- a) Explain SRS in detail 10
 - b) Explain Structure chart and its types 10
- Q6
- a) What do you mean by structured walkthroughs? Elaborate on it. 10
 - b) Explain the importance of ER diagram with an example 10
- Q7
- Write short notes on the following(any four) 20
- a) Data dictionary
 - b) DFD logical and physical
 - c) Decision trees
 - d) RAD
 - e) Black box testing

M.C.A. (SEM-I)

COMPUTER ORGANISATION & ARCHITECTURE

(MAY-2019)

Hours)

[Total marks: 100]

- Note (1) Question No. 1 is compulsory.
 (2) Attempt any four out of remaining six questions.
 (3) Answer to sub-questions should be grouped together.

- Q1. (a) Using K-Maps, simplify the following expression in four variables A, B, C, D. Draw logic diagram for the obtained solution. 5
 $F(A, B, C, D) = \Sigma (0,2,4,5,6,7,8) + d(12, 13,14,15)$
 (b) Explain micro operation in detail. 5
 (c) Compare computer organization and computer architecture. 5
 (d) Explain Synchronous counters in detail. 5
- Q2. (a) What is the significance of RAID? Explain any four RAID levels in detail. 10
 (b) Why are flip-flops called as bi-stable elements? Explain S-R flip flop in detail. 10
- Q3. (a) Compare hardwired Vs micro programmed control unit. 10
 (b) Why Cache memory is needed? Name various elements of cache design. 10
- Q4. (a) Difference the following 10
 I. SRAM & DRAM
 II. Programmed I/O & Interrupt driven I/O
 (b) Discuss 1 to 8 de-multiplexer using truth table. Draw its implementation using the appropriate gates. 10
- Q5. (a) What is instruction pipelining? Write a detailed note on six stage instruction pipeline along with diagram. How conditional branching affects pipeline performance? 10
 (b) With reference to parallel processing explain SISD, SIMD, MISD and MIMD. What is their significance in practical parallel processing approaches? 10
- Q6. (a) Explain DMA technique in detail with the help of suitable diagram. (Explain Breakpoints and Cycle stealing in it) 10
 (b) Define cluster. Explain different clustering methods in detail with its benefits and limitations. 10
- Q7. Write short note on any two of the following 20
 (a) Symmetric multiprocessors
 (b) Associative memory
 (c) Instruction cycle & its sub cycles

Duration 3 hours

Total 100 marks

- N.B: 1) Question No. 1 is compulsory.
 2) Attempt any four out of remaining six questions.
 3) Figures to the right indicate full marks.

1. (a) Let $A = \{3, 5, 9, 15, 24, 45\}$ and relation R be defined on B by xRy if and only if (10)

“ x divides y ”. Show that R is a partial order relation

1. Draw the diagram and Hasse diagram of R
2. Determine all minimal & all maximal elements.
3. find all least and greatest elements.
4. Give upper bounds and LUB of $A = \{3, 5\}$
5. Give all lower bounds and the GLB = $\{15, 45\}$

(b) (i) Establish the following result using truth tables. (05)
 $(P \wedge Q) \leftrightarrow (\neg R \vee Q) \vee P$

(ii) What is the solution of the recurrence relation $a_n = a_{n-1} + 2a_{n-2}$, (05)
 with initial condition $a_0 = 2, a_1 = 7$

2. (a) (i) Write converse, inverse and contra positive of the following statement. (05)
 “If weather will not be good then I will not travel.”

(ii) Obtain the disjunctive normal form of $(P \rightarrow Q) \wedge (\neg P \wedge Q)$ (05)

(b) (i) Find Δa_n where $a_n = n^2 + n + 1$ where Δ denotes forward difference. (05)

(ii) For the set $A = \{a, b, c\}$ give all the permutations of A . Show that the set of all permutations of A is a group under the composition operation. (05)

3. (a) Obtain the recurrence relation and initial conditions to find the maximum number of regions defined by n lines in a plane. Assume that the lines are not parallel and lines not intersecting at one point when $n > 2$. Solve the recurrence relation. (10)

(b) (i) Draw the transition state diagram of the finite state machine $M = (S, I, O, \delta, \lambda, s_0)$ given in the table (05)

	δ		λ	
	a	b	a	b
S_0	S_1	S_2	x	y
S_1	S_3	S_1	y	z
S_2	S_1	S_0	z	x
S_3	S_0	S_2	z	x

(ii) Explain with suitable example:- (1) Predicate (2) Proposition (05)

4. (a) Determine whether the relation R on a set A is reflexive, irreflexive, asymmetric, antisymmetric or transitive. (10)

$A =$ set of all positive integers, aRb iff $a \leq b + 1$

- (b) (i) Show by mathematical induction, that for all $n \geq 1$,
 $1+5+9+\dots+(4n-3) = n(2n-1)$ (05)
- (ii) Let G be a group. Show that the function $f:G \rightarrow G$ defined by
 $f(a) = a^2$ is a homomorphism iff G is abelian. (05)
5. (a) (i) Let T be set of even integers. Show that the semigroups $(Z,+)$ and
 $(T,+)$ are Isomorphic, where Z is a set of integers. (05)
- (ii) For the grammar specified below describe precisely the
 language, $L(G)$, produced. Also give the corresponding syntax
 diagram for the productions of the grammar. $G=(V,S,v_0,|\rightarrow)$
 $V = \{v_0,a,b\}$, $S = \{a,b\}$
 $v_0|\rightarrow aav_0$, $v_0|\rightarrow a$, $v_0|\rightarrow b$ (05)
- (b) (i) perform the following (10)
- i) $0111 \times 1010 = ?$
 - ii) $(413)_8 = (?)_{10}$
 - iii) $10100 \div 100 = ?$
 - iv) $(1101)_2 - (1001)_2 = ?$
 - v) $(49.25)_{10} = (?)_2$
6. (a) (i) Determine the validity of the following argument using deduction
 method: (05)
- “ If I study then I will pass examination . If I do not go to picnic
 ,then I will study. But I failed examination. Therefore , I went to
 picnic”
- (ii) Let G be a group and let 'a' be a fixed element of G . show that the
 function $f_a:G \rightarrow G$ defined by $f_a(x) = axa^{-1}$ for $x \in G$ is an
 isomorphism. (05)
- (b) (i) Let $H = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ be a parity check matrix. (05)
- Determine the group code $e_H: B^2 \rightarrow B^5$. How many errors will the
 above group code detect.
- (ii) Let $A = \{1,2,3,4\}$. For the relation
 $R = \{(1,1),(1,4),(2,2),(3,3),(2,1),(4,4)$ find the matrix of transitive
 closure by using Warshall's algorithm. (05)
7. (a) Show that $(2,5)$ encoding function $e: B^2 \rightarrow B^5$ defined
 $e(00) = 00000, e(01) = 01110, e(10) = 10101, e(11) = 11011$ is a group
 code. (10)
- Decode the following words with maximum likelihood technique:
 i) 11110 ii) 10011
- (b) Find the particular solution of $a_r + 5a_{r-1} + 6a_{r-2} = 3r^2$. (10)
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(5 Hours)**[total Marks: 100]**

N. B.: (1) Question number 1 is compulsory

(2) Attempt any 4 from question Nos. 2 to 7.

(3) Illustrate answers with sketches wherever necessary.

1. A] What do you understand by Law of Demand? What factors are important in explaining the law of demand? 10
- B] Monopolistic competition does not offer equilibrium in the short run to the industry. Why? 10
2. A] What is the significant contribution of Fredrick Taylor to management science? Explain his principle of management? 10
- B] “Economics of scale may be either internal or external they may be technical, managerial, financial or risk – bearing” – Elucidate. 10
3. A] Explain Law of Supply. 10
- B] What do you mean by Performance Appraisal? Explain any two methods of Performance Appraisal? 10
4. A] Explain the Product Life Cycle and its impact on business. 10
- B] What are the various Leadership theories? Explain theory X and theory Y in details. 10
5. A] Explain the concept of Economies and Diseconomies of scale. What is break-even point? 10
- B] Explain the methods of Demand Forecasting? 10
6. A] Discuss the nature and scope of Managerial economics? 10
- B] Explain the decision making process in details. 10
7. Write short notes on: **(Any Four)** 20
 - a) Compensation & administration
 - b) On the job training
 - c) Market Research
 - d) Motivation
 - e) HRM

M.C.A. (SEM-I)**INTRODUCTION TO WEB TECHNOLOGY****(MAY-2019)****(3 Hours)****[Total Marks :100]**

- N.B** (1) Question No.1 is **compulsory**.
 (2) Answer any **four** questions from Question Nos. **2 to 7**.
 (3) Figures to the right indicate full marks.

1. Attempt any FOUR questions **(20)**
 - a) Frameset
 - b) Math Object in JavaScript
 - c) Web Development cycle
 - d) DHTML
 - e) <TABLE> tag
2. (a) Explain types of lists in HTML with a suitable example. **(10)**
 (b) Explain Date Object in JavaScript with at least five methods. **(10)**
3. (a) Using form controls create a course registration form. **(10)**
 (b) What are Cookies? Explain with an example, advantage of cookies. **(10)**
4. (a) Write a recursive function in JavaScript to print the Fibonacci series. **(10)**
 (b) Explain the differences between application object & session object in ASP. **(10)**
5. (a) What is CSS? Explain different types of CSS with example. **(10)**
 (b) Explain different types of website with suitable example. **(10)**
6. (a) Explain Request and Response object used in ASP. **(10)**
 (b) Explain Block level Tags and Text level Tags **(10)**
7. (a) Explain Array as Object in JavaScript with at least four methods. **(10)**
 (b) Differentiate between **(10)**
 - i) GET and POST method
 - ii) Client side scripting and server side scripting