Printed Pages: 2 **Sub Code: RCAI201**

Paper Id: 238200 **Roll No.** | | | | | | | | | | |

MCA (INT.)
(SEM II) THEORY EXAMINATION 2022-23
ADVANCE PROGRAMMING IN C

Time: 3 Hours ***Total Marks: 70***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

(a) Define the term array with example.
(b) What do you mean by array of strings?
(c) Briefly explain the benefits of pointer.
(d) What is the use of free( ) function?
(e) What are the different ways of declaring a structure?
(f) What do you mean by EOF?
(g) Why initgraph( ) function is used?

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

(a) What do you mean by two-dimensional array? How is it initialized? Explain with the proper example. Compare it with one-dimensional array.
(b) Discuss and compare malloc and calloc functions with proper example.
(c) What does nesting of structures mean? Explain with the help of a program.
(d) Discuss and compare bitwise right shift and left shift operators with proper example.
(e) Explain the concept of #if and #elifdirectives with proper example.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a) How a string is declared, initialized and stored in C? Explain. Also differentiate between-
  (i) strcmp( ) and strcmpi( )
  (ii) strcpy( ) and strncpy( )
(b) What are the advantages of using array? Explain. Differentiate between array and structure.

4. Attempt any *one* part of the following: 7 x 1 = 7

(a) Write a C program that dynamically allocates memory for an array of size n, reads elements of array and sorts them in ascending order.
(b) What do you mean by pointer-to-pointer and array of pointers? Explain with the help of proper example.

5. Attempt any *one* part of the following: 7 x 1 = 7

(a) Write a C program to define a structure named **Student**with following details of student-

(i) name , (ii) age and (iii) address

Use array variable to read and display the details of 5 students.

(b) What is Enumerated data type? Explain with proper example. What are its limitations?

6. Attempt any *one* part of the following: 7 x 1 = 7

(a) What is a file? Differentiate between –

(i) High level I/O and Low-level I/O

(ii) Text File and Binary file

(iii) Read mode and write mode

(b) Discuss Bitwise AND, OR and XOR operators with example

7. Attempt any *one* part of the following: 7 x 1 = 7

(a) Write a C program to draw two lines with different colors and thickness.

(b) What is a macro and how is it different from a C variable? What are the advantages of using macro definitions in a program?

Printed Pages:02 **Sub Code:RCAI202**

Paper Id: 238536 **Roll No.** | | | | | | | | | | |

MCA (Integrated)
(SEM II) THEORY EXAMINATION 2022-23
COMPUTER ORGANIZATION

Time: 3 Hours ***Total Marks: 70***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

(a) X = 01110 and Y = 11001 are two 5-bit binary numbers represented in two's complement format. Find the sum of X & Y in its complement form.
(b) Define the term"Computer organization".
(c) Differentiate between combinational and sequential circuits.
(d) Explain maskable and non-maskable interrupt.
(e) Explain the different types of micro-operations.
(f) What are the differences between the main memory and control memory?
(g) How many bits would you need to address a 2M* 32 memory if memory is
(i)byte addressable
(ii) word addressable

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

(a) Explainthe bus arbitration problem.Also define the four schemes for bus master and slave.
(b) State the difference between clock cycle and clock frequency
(c) Illustrate the term instruction cycle and its different phases of execution.
(d) Draw the block diagram of DMA controller. Illustrate, the reason of keeping bidirectional control lines in DMA controllers.
(e) Consider memory block request:
3, 4, 8, 3, 9, 6, 16, 13, 35, 12, 3, 8, 6, 7, 30, 45, 12, 67, 22
Consider a full **associative** mapping for the 8 cache blocks (0-7) find the following values for **LRU and FIFO**
(i) Number of misses
(ii) Number of hits
(iii) Hit ratio.
Cache block number which contains main memory block 12

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a) Explain 2 –bit Arithmetic Logic Unit design along with suitable diagram.
(b) Draw the flow chart of Booth's Algorithm for multiplication and show the multiplicationprocess using Booth's Algorithm for (-15) *(-13).

4. Attempt any *one* part of the following: 7 x 1 = 7

(a) Explain the difference between Hardwired – control and Micro – programmed control. Is it possible to have a hardwired control associated with a control memory?

(b) What is the micro program sequencer? With the help of block diagram explain the working of micro program sequencer.

5. Attempt any *one* part of the following: 7 x 1 = 7

(a) Sketch the concept of stack organization and explain the instruction format in detail.

(b) Demonstrate the concept of addressing modes. An instruction is stored at location 300 with its address fields at location 210. The address field has the value 500. A processor register RI contain the number 200 and index register contains the value 300. Evaluate the effective address if the addressing mode of the instruction is (i) Direct (ii) Immediate (iii) Relative (iv) Register Indirect (v) Auto increment (vi) Auto decrement

6. Attempt any *one* part of the following: 7 x 1 = 7

(a) Discuss the modes of transfer & explain the following.
(i) Programmed I/O
(ii) Interrupt initiated I/O

(b) Describe asynchronous data transfer. What are the methods through which it can be achieved?

7. Attempt any *one* part of the following: 7 x 1 = 7

(a) Consider the page references 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, with 4-page frame. Find number of page fault using FIFO, LRU and optimal page replacement algorithm.

(b) Explain the concept of Auxiliary memory and its need in the computer system.

Printed Pages:02 **Sub Code: RAS 204**

Paper Id: 238482 **Roll No.** | | | | | | | | | | |

B.TECH
(SEMII) THEORY EXAMINATION 2022-23
PROFESSIONAL COMMUNICATION

Time: 3 Hours ***Total Marks: 70***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

(a) What do you mean by Deductive method of paragraph writing?
(b) Define syllable with the help of examples.
(c) What do you mean by Mass Communication?
(d) Make sentences using the homophones – 'beach' and 'beech' – to bring out differences between them.
(e) What is a rose? Answer this question from the point of:
i) A scientist ii) A literary artist
(f) Give synonyms of- 'Authentic', 'Barren', 'Candid', 'Feeble'.
(g) Why is philosophy said to be comprehensive science?

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

(a) Discuss the devices used for developing a paragraph? Write briefly.
(b) "Language is a tool of communication but there are exceptions too." Explain with your original comments.
(c) What do you understand by claim letter? Draft a claim letter as an example.
(d) What are the differences between the methods and aims of science as compared to those of humanities? Clarify
(e) Describe different modes of speech making? Differentiate between extempore and impromptu speech.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a) Discuss the various factors responsible for organizational barriers to technical communication in a professional organization.
(b) Elucidate the differences between General and Technical communication.

4. Attempt any *one* part of the following: 7 x 1 = 7

(a) What are the requisites of good sentence writing? Describe various methods to introduce variety in sentence construction.
(b) List some of the methods used to form new words. Support your answer with examples.

5. Attempt any *one* part of the following: 7 x 1 = 7

(a) Describe the process of negotiation. Specify the qualities of a good negotiator.
(b) Discuss the formal structure of a technical proposal.

6. Attempt any *one* part of the following: 7 x 1 = 7

(a) Discuss the paralinguistic features of Voice Dynamics with respect to presentation strategies.

(b) What is Kinesics? How do the elements of kinesics play an important role in the success of an oral presentation?

7. Attempt any *one* part of the following: 7 x 1 = 7

(a) Drawing your information from Aldous Huxley's essay, compare the language of literature with the language of science.

(b) Elucidate the following statement of Barry Commoner in his essay, 'Science and Survival': "The new hazards are neither local nor brief."

Printed Pages:02 **Sub Code: RAS207**

Paper Id: 238394 **Roll No.** | | | | | | | | | | |

MCA (Integrated)
(SEM II) THEORY EXAMINATION 2022-23
DISCRETE MATHEMATICS FOR MCA

Time: 3 Hours ***Total Marks: 70***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

(a) If $A = \{1, 2, 3, 4, 5, 6\}$ and $B = \{1, 2, 3\ 4, 7, 8\}$. $Then\ find\ A - B$

(b) If $A = \{1,2,3\}$ and $R = \{(1,1), (1,2), (2,3), (3,1)\}$. $Then\ find\ R^{-1}$.

(c) Define Generating numeric function with example.

(d) Write down the Piano's axioms.

(e) Define the Subgroup with example.

(f) Write down the truth tables for: $p \rightarrow q$ and $p \leftrightarrow q$.

(g) What do you mean by
$Greatest\ element\ and\ Least\ element\ of$ $Hasse\ diagram$

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

(a) Define the composite relation .
If A= {a,b} and R={ (a,a), (b,a), (b,b)} & S= { (a,b),(b,a),(b,b)} then verify that $(S\ o\ R)^{-1} = R^{-1}\ o\ S^{-1}$

(b) Using Principle of Mathematical Induction, show that $8^n - 3^n$ is divisible by 5 for $n \geq 1$.

(c) Define the even odd permutation of disjoint cycle.Express the following permutation as the product of disjoint cycles: g= (1 3 2 5) (1 4 3) (2 5 1)

(d) Construct the truth table : ((p⇒ q) ∨ (q ⇒ p)) ⇔ p
Is the preposition: Tautology, Contradiction or Contingency?

(e) Define Dual Lattice. And Show that Dual of a lattice is a lattice.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a) For any set A and B, Prove that : $A - (A \cap B) = A - B$.

(b) Define the composition of function .
If $X = \{1,2,3\}, Y = \{p, q\}$ and $Z = \{a, b\}$ and the functions f and g are define as : $f : X \rightarrow Y$ be $f = \{(1, p), (2, p), (3, q)\}$ and
$g : Y \rightarrow Z$ be $g = \{(p, q), (q, b)\}$. Then find g o f and f o g.

4. Attempt any *one* part of the following: 7 x 1 = 7

(a) Prove that the set G= {0,1,2,3,4,5} is a finite abelian group of order 6 with respect to addition modulo 6.

(b) Prove that inverse of every element of a group is unique

5. Attempt any *one* part of the following: 7 x 1 = 7

(a) Solve Recurrence Relation:
$a_n - 4a_{n-1} + 4a_{n-2} = 0$with initial condition $a_0 = 1\ and\ a_1 = 6.$

(b) Consider the two numeric functions **a** and **b,** where **:**

$$a_r = \begin{cases} 0 & ,0 \le r \le 3 \\ 2^{-r} + 3 & ,r \ge 4 \end{cases} and$$

$$b_r = \begin{cases} 2 - 3^r & ,0 \le r \le 2 \\ 2r + 5 & ,r \ge 3 \end{cases}$$

Then find: $c_r = a_r . b_r$

6. Attempt any *one* part of the following: 7 x 1 = 7

(a) If $K(x) : x\ is\ student, M(x): x\ is\ clever, N(x) : x\ is\ successful.$
Express the following using quantifiers:
(i) There exists a student
(ii) Some students are clever
(iii) Some students are not successful.

(b) Prove the validity of the following argument:
If a man is bachelor, he is unhappy. If a man is unhappy, he dies young.
Therefore, bachelors die young.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a) If D ={1, 2, 4, 8, 16, 32, 64} be ordered by the relation "a divides b".
Then show that D is a Poset.Also draw the Hasse diagram.

(b) Let A= {1,2,3,6} and Let $\le$ the divisibility relation on A and let B= { ϕ, {a}, {b}, {a,b}} and let $\subseteq$ $\leq$be the usual relation "is subset of " of set theory .Then show that (A , $\leq$) and (B , $\subseteq$) are isomorphic.

Printed Pages:02 **Sub Code:REC 202**

Paper Id: 238299 **Roll No.** | | | | | | | | | | |

MCA (INTEGRATED)
(SEM II) THEORY EXAMINATION 2022-23
DIGITAL ELECTRONICS

Time: 3 Hours ***Total Marks: 70***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

(a) Convert $(1056)_{16} \rightarrow (\ ?\ )_{10}$

(b) Which gates are called as Universal gate and what are their advantages?

(c) Differentiate between canonical form and standard form.

(d) Consider the following SOP expressionF = WXY + XYZ + YZW
Implement the given expression with the help of NAND gate.

(e) Define the term Magnitude comparator.

(f) What is the difference between Synchronous and Asynchronous Counters?

(g) What is the difference between Latch and Flip-flop?

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

(a) What do you mean by digital computer? Design the block diagram of digital computer and explain it in detail.

(b) Explain all the Postulates/Laws of Boolean Algebra.

(c) Simplify the Boolean function by means of K-map:
F (A, B,C,D)= $\sum$ m(1, 2, 6, 7, 8, 13, 14, 15) + d(0, 3, 5, 11, 12)

(d) Define decimal adder with truth table and logic diagram.

(e) Discuss the different types of shift registers with their block diagram.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a) Convert the following:
(i) $(4A3)_{16} = (?)8$
(ii) $(598)_{10} = (?)_{16}$
(iii) $(100011)_2 = (?)_{10}$

(b) (i) Subtract $(11010)_2$ from $(11111)_2$using 2's complement method.
(ii) Subtract $(1010)_2$ from $(1000)_2$ using 1's complement.

4. Attempt any *one* part of the following: 7 x 1 = 7

(a) For the Boolean function F = xy'z + x'y'z + w'xy + wx'y + wxy
(i) Obtain the truth table of F.
(ii) Draw the logic diagram, using the original Boolean expression.
(iii) Use Boolean algebra to simplify the function to a minimum number of literals.

(b) Describe all the logic gates with their truth table, logic symbol and expression.

5. Attempt any *one* part of the following: 7 x 1 = 7

(a) Reduce the expression f = ∑ m (0,1,2,3,5,7,8,9,10,12,13) using K-maps and implement the real minimal expression using NOR logic.

(b) Simplify the following Boolean Function using Tabulation method.F(a,b,c,d)=∑ m(0,2,3,6,7,8,10,12,13).

6. Attempt any *one* part of the following: 7 x 1 = 7

(a) Construct a 4*16 decoder using 3*8 decoder.

(b) Implement the boolean function F(A, B, C, D) = ∑ m(0, 1, 5, 6, 8, 10, 12, 15) using 8 : 1 multiplexer.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a) Explain various types of flip-flops in detail with suitable logic circuits.

(b) Describe the of ripple counter in detail.