Enrol. No. | S | R | H | U | | | | | | | | | Regn. No. | D | D | | | | | | | | |

END SEMESTER EXAMINATION, DECEMBER - 2024

MCA Semester - I

Course Name: Computer Fundamentals & Programming for Problem Solving **Course Code: MCA111**

Time allotted: 03 Hours **Max. Marks: 100**

Note: Read all the instructions carefully.

Q.1. Attempt all. **(10×2=20)**

QN	Questions	CO	PO
a.	List out any 2 math functions?	CO3	PO1
b.	How can we find the size of structure?	CO4	PO2
c.	What are the advantages of C language?	CO2	PO1,2
d.	What is command line argument?	CO5	PO1
e.	Differentiate int add(a,b) and int add(&a,&b).	CO3	PO2
f.	What is meant by linking process?	CO1	PO1
g.	Write the syntax of if..else statement.	CO2	PO1
h.	What are the uses of pointer?	CO3	PO1,2
i.	What do you mean by syntax error?	CO1	PO1
j.	Explain return statement.	CO3	PO1

Q.2. Attempt any five out of Seven. **(5×4=20)**

QN	Questions	CO	PO
a.	Differentiate variable and pointer variable with suitable example.	CO1	PO1,2
b.	Differentiate call by value and call by reference with example.	CO3	PO1,2
c.	Write the guidelines to use scanf() and printf() functions in C language	CO2	PO1,2
d.	What is macro substitution? Explain with a suitable example.	CO4	PO1,3
e.	What is static variable and what is its scope?	CO4	PO1,2
f.	Explain the use of pointers with single dimensional array with a suitable example.	CO3	PO1,3
g.	Explain dynamic memory allocation in brief.	CO3	PO1

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Q.3. Attempt any three out of four. **(3×10=30)**

QN	Questions	CO	PO
a.	Explain the following terms – **(3+3+4)**		
	(i) Function Declaration	CO3	PO1
	(ii) Precedence	CO2	PO1
	(iii) Run Time Error	CO5	PO1
b.	Attempt all. **(3+3+4)**		
	(i) Compare arrays and structures.	CO4	PO2
	(ii) State the advantages of user defined functions over pre-defined function.	CO3	PO2
	(iii) What do you mean by nested structure? Explain.	CO4	PO1
c.	Attempt all. **(3+3+4)**		
	(i) Why files are needed?	CO5	PO1
	(ii) How to open a file?	CO5	PO1
	(iii) What is meant by Recursive function?	CO3	PO1
d.	Attempt all. **(3+3+4)**		
	(i) Write an algorithm to find the area and perimeter of a circle.	CO1	PO2,3
	(ii) Draw a flow chart to find the area and perimeter of a circle.	CO1	PO2,3
	(iii) Write a program to find the area and perimeter of a circle.	CO1	PO2,3

Q.4. Attempt any two out of three. **(2×15=30)**

QN	Questions	CO	PO
a.	(i) Explain with examples formatted input output statements in C.	CO2	PO1,2
	(ii)Write a C program to store the employee information using structure and search a particular employee using Employee number.	CO4	PO1
b.	(i) Write a C program to find the factorial of a number using do-while, where the number n is entered by user.	CO2	PO3
	(ii) Define string. List out all string manipulation function. Explain any two with example.	CO3	PO1
c.	(i)What is array? Explain the declaration and initialization of one dimensional and two dimensional array with an example.	CO3	PO1,3
	(ii) Explain the following operators in C language- 1) Relational 2) Logical 3) Conditional	CO2	PO1

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Enrol. No. S R H U | Regn. No. D D

END SEMESTER EXAMINATION, DECEMBER- 2024

MCA Semester - I

Course Name: Software Engineering & Project Management

Course Code: MCA116

Time allotted: 03 Hours **Max. Marks: 100**

Note: Read all the instructions carefully.

Q1. Objectives Type Questions (Attempt All) **(10X2=20)**

a.	What is software design document?	CO1	3
b.	What is the need of ER diagram?	CO1	1
c.	What is the primary goal of managing contracts in software projects?	CO5	2
d.	Define the term software maintenance.	CO2	1
e.	What is PERT?	CO4	2
f.	How software project maintenance are is different to conventional project management?	CO3	2
g.	What is the primary goal of proactive defect prevention in software maintenance?	CO4	3
h	What is the primary purpose of software testing?	CO2	3
i	What is the primary focus of project management in software development?	CO3	1
j	What is the importance of capability maturity model?	CO5	2

Q2. Short Answer Type (Attempt any five out of seven) **(5X4=20)**

a.	Differentiate between adaptive maintenance and corrective maintenance.	CO3	3
b.	What modeling technique represents the flow of data within a software system?	CO1	1
c.	Briefly describe the activities involved in software project management.	CO2	2
d.	Define the term "Software Engineering."	CO1	1
e.	Why is risk assessment important in project management?	CO5	2
f.	What is the purpose of the Software Development Life Cycle (SDLC)?	CO2	2
g.	What is the primary goal of managing contracts in software projects?	CO4	3

Q3. Structured Questions (Attempt any three out of four) **(3X10=10)**

a.	(i) How does User Interface Design contribute to the usability of software applications? (ii) Outline the key elements of a Test Plan. (iii) Define the term "Software Modeling."	CO2	2,1,2
b.	(i) Differentiate between product quality and process quality management. (ii) How does the Capability Maturity Model (CMM) assess software processes? (iii) Discuss one key characteristic of software components.	CO3	3,2,3
c.	(i) Discuss the architectural views and styles in software design. (ii) Define the concept of "Requirement Validation" in software development. (iii) How does Traceability contribute to the reliability of software requirements?	CO1	3.2,1
d.	(i) How does risk assessment contribute to effective project scheduling? (ii) Define the concept of "Software Quality Assurance (SQA)." (iii) Discuss the significance of quality standards like ISO 9000 in software development.	CO4	2,1,2

Q4. Long Answers (Attempt any two out of three) **(2X15=30)**

a.	(i) Describe the different categories of software maintenance and the role of adaptive maintenance. (ii) Explore various Testing Methods in Software Testing and Maintenance and their evolution.	CO3	3,2
b.	(i) Explain Software Quality Assurance and its role in ensuring quality in the software development process. (ii) Describe the procedural and quantitative approaches in quality management.	CO5	1,2
c.	(i) Discuss the architectural views and styles in software design. (ii) How does Traceability contribute to the reliability of software requirements?	CO4	2,3

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END SEMESTER EXAMINATION, DECEMBER - 2024

MCA Semester - I

Course Name: Scripting Languages **Course Code: MCA115**

Time allotted: 03 Hours **Max. Marks: 100**

Note: Read all the instructions carefully.

Q.1. Objective type

(Very Short/ Short Answer,MCQ, One-liners, Fill in the Blanks, True/False) Attempt all. (10 X 2=20)

a.	What is the role of XML Schema?	CO3	1,2
b.	How do you create a radio button in an HTML form?	CO1	1
c.	What is the purpose of the <h1> element in HTML?	CO1	1,2
d.	How do you create an HTML list item?	CO1	1
e.	What is the HTML element for including JavaScript in a web page?	CO2	1
f.	Write a PERL code snippet to print hello everyone.	CO4	1,4
g.	What is Ruby on Rails and what is its primary use?	CO5	1
h.	What is the HTML element for defining a division or section of a web page?	CO1	1
i.	Explain the role of meta tag.	CO1	1
j.	What is the purpose of the HTML <header> element?	CO1	1

Q.2. Short notes/ Short Answer Type (Attempt any five out of seven) (5 X 4=20)

a.	How do you define a method in Ruby? Explain with example.	CO5	1,2
b.	What are control statements in JavaScript? Explain with example.	CO2	1,2
c.	Explain the role of constructors in JavaScript.	CO2	1,2
d.	Distinguish between XML and HTML. Give examples of both including syntax.	CO3	1,2
e.	Explain the use of and tags.	CO2	1,4
f.	Explain the concept of DTDs.	CO3	1,2
g.	Describe the differences between CSS "margin" and "padding" properties.	CO1	1,2

Q.3. Structured Question (Attempt any three out of four) (3 X 10=30)

a.	(i) Explain the importance of well-formed XML and how XML parsers handle various types of errors. (ii) Explain the role of namespaces in XML.	CO3	1,2
b.	Comment on associations in rail. Demonstrate how to use polymorphic associations with example.	CO5	1,2
c.	(i) What is Perl, and how does it fit into the world of programming languages? (ii) Explain the history and evolution of Perl as a scripting language. (iii) How does Perl differ from other popular programming languages like Python or Ruby?	CO4	1,4
d.	(i) Describe the various data types and variables in Perl, including scalars, arrays, and hashes. (ii) What is Perl's role in text processing and manipulation, and how are regular expressions used in Perl?	CO4	1,4

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Q.4. Long Answer/ Essay type (attempt any two out of three) **(2 X 15=30)**

a.	Develop HTML code to illustrate the usage of following- i) Ordered List ii) Unordered list iii) Definition List	CO1	1,3
b.	(i) Discuss Perl's support for exception handling and error reporting. (ii) Describe the built-in functions and libraries in Perl for common tasks like file manipulation, string processing, and data transformation.	CO4	1,4
c.	i) Elaborate how elements are accessed in JavaScript? Provide proper code to support your answer. ii) Explain different data types utilized in JavaScript.	CO2	1,3

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END SEMESTER EXAMINATION, DECEMBER- 2024

MCA Semester - I

Course Name: Computer Organization and Architecture **Course Code: MCA113**

Time allotted: 03 Hours **Max. Marks: 100**

Note: Read all the instructions carefully.

Q.1. Attempt All questions. Each carries equal marks. **(10X2=20)**

a.	What is cache memory?	CO5	PO1
b.	DRAM stands for……	CO5	PO1
c.	Define compiler.	CO5	PO2
d.	Define instruction.	CO2	PO2
e.	Define Page replacement algorithm MRU.	CO5	PO1
f.	What is unconditional branch instruction	CO2	PO2
g.	SIMD stands for……..	CO3	PO1
h.	Define virtual memory.	CO2	PO2
i.	What is the data bus width of the 8085 microprocessor?	CO4	PO1
j.	List out 8085 CPU basic registers.	CO4	PO2

Q.2. Attempt any five questions. Each carries equal marks **(5X4=20)**

a.	Explain the concept of pipeline and the purpose of an arithmetic pipeline in a CPU, how does it contribute to faster execution of arithmetic operations?	CO3	PO2
b.	Define virtual address, physical address, page, and page fault.	CO5	PO1
c.	Explain the Locality of reference, and how spatial and temporal locality of reference differ.	CO5	PO2
d.	What are general-purpose registers, and what is their primary function in a CPU?	CO1	PO1
e.	Define "system bus" in computer architecture and their type and role in memory transfers.	CO1	PO2
f.	Explain immediate, direct, and indirect addressing modes with examples.	CO3	PO2
g.	Define priority interrupt and its types and role in managing I/O operations.	CO4	PO2

Q3. Attempt any three questions. Each carries equal marks. **(3X10=30)**

a.	Define 16-bit instruction and the instruction cycle with a neat diagram. Explain different stages of the instruction cycle. Draw the flowchart of instruction cycle.	CO2	PO2
b.	Explain the 8085-microprocessor organization with neat diagram in detail.	CO4	PO2
c.	How are program loops implemented in assembly language, give an example? Explain the use of conditional and unconditional branching microoperations. Describe any two conditional and two unconditional instructions.	CO3	PO2
d.	Explain the memory hierarchy with size, cost and speed factors. Draw the block diagram of RAM and ROM organization. Describe different types of RAM and ROM.	CO5	PO2

Q4. Attempt any two questions. Each carries equal marks. **(2X15=30)**

a.	Explain page fault, hit ration and page replacement techniques with suitable examples. Consider the following page reference string: 2,3,2,3,1,2,4,5,6,3,4,2,1,5,6,2,1,3,7,6 How many page faults would occur for the algorithm FIFO, LRU, MRU and OPR algorithms using four frames, also calculate the hit ratio.	CO5	PO3
b.	Define control unit & its role. Explain the hardwired and microprogrammed control unit with the help of a neat diagram. Differentiate between the hardwired and the microprogrammed control unit.	CO2	PO2
c.	What is stored program architecture. Draw the computer diagram as per Von Neuman architecture. Explain registers and the key components of the Von Neumann architecture and their functions.	CO1	PO1

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END SEMESTER EXAMINATION, DECEMBER - 2024

MCA Semester - I

Course Name: Discrete Mathematics **Course code: MCA112**

Time allotted: 03 Hours **Max. Marks: 100**

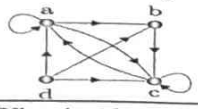
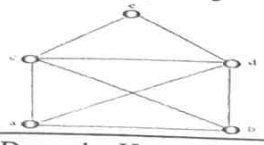
Note: Read all the instructions carefully.

Q.1. Objectives Type **(10 x 2=20)**

(Very short/ Short Answer, MCQ, One-liners, Fill in the Blank, True/ False) Attempt all.

QN	Questions	CO	PO
a.	What do you understand by algebraic structure? Give some examples.	5	1
b.	If $C(18,r) = C(18,r+2)$, find the value of $C(r,5)$	1	3
c.	If $R = \{(1,2),(4,3),(2,2),(2,1),(3,1)\}$ be a relation on $S = \{1,2,3,4\}$, find the symmetric closure.	2	2
d.	Is the given graph form a Euler circuit or path? Give reason to support your answer. 	3	1
e.	Draw the directed graph that represent the relation $R = \{(1,1),(2,2),(1,2),(2,3),(3,2),(3,1),(3,3)\}$ on $X = \{1,2,3\}$.	2	2
f.	Consider the following relation $R = \{(1,1),(2,2),(2,3),(3,2),(4,2),(4,4)\}$ on $A = \{1,2,3,4\}$. Is R i) Antisymmetric ii) Symmetric	2	1
g.	What do you understand by chromatic number? Draw the graph having chromatic no 2 and three.	3	1
h.	Distinguish between $\emptyset, \{0\}, \{\emptyset\}, 0$.	1	2
i.	If $A = \{1,2,3,4,5,6\}, B = \{3,6,8,12,17,18\}$, then find $A \cup B, A \cap B, A - B$	1	2
j.	What do you understand by semi group?	5	1

Q.2. Short notes / Short Answer Type (Attempt any five out of Seven) **(5 x 4=20)**

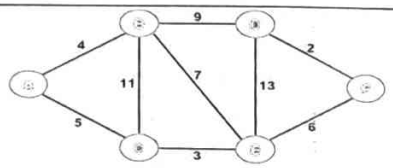
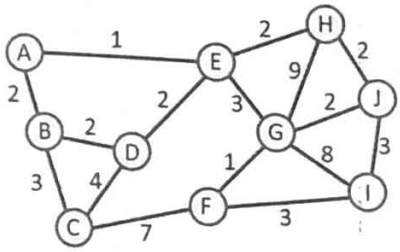
QN	Questions	CO	PO
a.	Find the first five terms of the given recurrence relation $a_k = 2a_{k-1} + k$, for all integers $k \geq 2, a_1 = 1$.	1	2
b.	Find the number of possible ways in which the letters of the word $COTTON$ can be arranged so that the two T's don't come together.	1	3
c.	Find the in-degree and out-degree of each vertex of the graph given below. 	3	3
d.	What is Abelian group?	5	1
e.	If $f: \mathbb{R} \to \mathbb{R}$ and $g: \mathbb{R} \to \mathbb{R}$ defined by $f(n) = n^2$, $g(n) = n+1$, $h(n) = n-1$. Find the following composition functions: i) $gofoh(n)$ ii) $fogoh(n)$	2	1
f.	Using Fleury's algorithm find the Euler path in the given graph. 	3	3
g.	Draw the Hasse diagram for the divisibility relation on the set $A = \{2,3,6,12,24,36\}$	2	2

P.T.O./-

Q.3. Structured Question (Attempt any three out of four) **(3 x 10=30)**

QN	Questions	CO	PO
a.	Let $A = \{1,2,3,4\}$, for the relation R whose matrix is given. Find the matrix of transitive closure by using Warshall's algorithm. $$M_R = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$	2	3
b.	Prove by the method of induction $(n \in N)$. $\frac{1}{3.6} + \frac{1}{6.9} + \frac{1}{9.12} + \cdots + \frac{1}{3n(3n+3)} = \frac{n}{9(n+1)}$	1	2
c.	Solve $a_n = a_{n-1} + 2a_{n-2}, n \geq 2$ with initial conditions $a_0 = 0, a_1 = 1$.	1	2
d.	The relation R on a set $A = \{1,2,3,4\}$ is defined by $R = \{(1,1),(1,2),(1,4),(2,2),(2,1),(2,4),(3,3),(3,4),(3,2),(4,2),(4,1)\}$. Find the diagraph for R and the matrix M_R.	2	2

Q.4. Long Answer / Essay type (Attempt any two out of three) **(2 x 15=30)**

QN	Questions	CO	PO
a.	a.1. Apply Dijkstra's algorithm to the graph and find the shortest path from A to F. 	3	3
	a.2. If $C(n,x) = 56$ and $P(n,x) = 336$, find the value of n and x.	1	3
b.	Find the minimal spanning tree of the weighted graph using Prim's algorithm. 	4	3
c.	$*$ is a binary operation defined on Q. Find which binary operations are commutative and which of them are associative? Also find the identity element, (if it exists) i) $a * b = a + b + ab, a, b \in \mathbb{Z}$ ii) $a * b = a + ab, a, b \in \mathbb{Z}$.	5	2

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