PAPER ID-311214

Subject Code: BMC102

Roll No: | | | | | | | | | | | | | |

MCA
(SEM I) THEORY EXAMINATION 2025-26
PROBLEM SOLVING USING C

TIME: 3 HRS **M.MARKS: 70**

SECTION A

1. Attempt *all* questions in brief. **2 x 07 = 14**

Q no.	Question	CO
a.	Differentiate between Keyword and Identifier.	1
b.	Write a C program that checks whether the two numbers entered by the user are equal or not.	2
c.	Write the syntax of ternary operator.	2
d.	Define Pointer to Pointer.	3
e.	Differentiate between character and string.	4
f.	In which situation, members of structure are accessed using arrow operator?	5
g.	Compare text file and binary file.	5

SECTION B

2. Attempt any *three* of the following: **07 x 3 = 21**

a.	Explain the concept of structured programming.	1
b.	What is recursion? Write a C program using recursion to print GCD of 2 numbers.	2
c.	Explain different parameter passing techniques through suitable example.	3
d.	Differentiate between structure and union. Define a union "un" with three members a,b and c, which are of integer, float and char type respectively.	4
e.	Write a program to append text in an already existing text file.	5

SECTION C

3. Attempt any *one* part of the following: **07 x 1 = 07**

a.	What is Algorithm? What are the properties of Algorithm? Write an algorithm to check year is a leap year or not.	1
b.	Explain various types of Data types which we can use in C programming language.	1

4. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Explain switch case statement and write a program using C to check character entered by user is a vowel or not.	2
b.	Write a C program and draw flowchart to check number is an Armstrong number or not.	2

5. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Define Array and write a C program to print multiplication of 2 different matrices or order 3*3 each.	3
b.	Write a program in C which accepts names and age of 10 persons and print the name of that person, who is youngest in age. Make use of pointer method to declare the array.	3

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MCA

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PROBLEM SOLVING USING C

TIME: 3 HRS **M.MARKS: 70**

6. Attempt any *one* part of the following: **07 x 1 = 07**

a.	What are the different storage classes of C programming language? Explain through suitable example.	4
b.	When do you use pointers to structure? Write a C program to accept different goods with the number, price and date of purchase and display them.	4

7. Attempt any *one* part of the following: **07 x 1 = 07**

a.	What are the different functions used for dynamic memory allocation? Explain through proper syntax and example of each.	5
b.	Distinguish between symbolic constants and literal constants with examples.	5

Subject Code: BMC101

PAPER ID-310068

Roll No: 2 5 1 2 7 8 0 1 4 0 0 1 9

MCA

(SEM I) THEORY EXAMINATION 2025-26

FUNDAMENTAL OF COMPUTERS & EMERGING TECHNOLOGIES

TIME: 3 HRS **M.MARKS: 70**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **02 x 7 = 14**

Q no.	Question	CO	Level
a.	List the major components of a computer system.	1	K1
b.	What are output devices?	1	K1
c.	Define an operating system.	2	K2
d.	Define FTP.	3	K1
e.	What is Telnet?	3	K1
f.	Define blockchain.	4	K2
g.	What is augmented reality (AR)?	5	K1

SECTION B

2. Attempt any *three* of the following: **07 x 3 = 21**

Q no.	Question	CO	Level
a.	Explain input, output, CPU and memory units with diagrams.	1	K2
b.	Explain LAN, MAN and WAN with examples.	2	K3
c.	Explain the Internet, its architecture and functioning.	3	K2
d.	Discuss features, limitations and applications of blockchain.	4	K3
e.	Discuss grid computing and green computing.	5	K3

SECTION C

3. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Describe the problem solving concept and algorithm development.	1	K3
b.	Explain characteristics, limitations and representation of algorithms using pseudo-code.	1	K3

4. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Explain different types and classifications of operating systems.	2	K2
b.	Discuss data communication and network topologies in detail.	2	K2

5. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Define IoT and explain its components.	3	K3
b.	Explain search engines, e-mail and web browsers.	3	K2

6. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Explain cloud computing, its nature and benefits.	4	K2
b.	Discuss cloud services provided by AWS, Google, Microsoft and IBM.	4	K3

7. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Explain big data analytics and its applications.	5	K2
b.	Explain brain computer interface and its applications.	5	K2

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MCA
(SEM I) THEORY EXAMINATION 2025-26
DISCRETE MATHEMATICS

TIME: 3 HRS **M.MARKS: 70**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **02 x 7 = 14**

Q no.	Question	CO	Level
a.	Is function $f: R \to R$, defined as $f(x) = \|x\| + x$, one to one? Reason?	1	K3
b.	Define Multiset with an example.	1	K2
c.	Define Lattice and Complete lattice.	2	K1
d.	Use quantifiers to express the statement "All students in the class have taken a course in Discrete Mathematics" and also write its negation.	3	K2
e.	State the Lagrange's theorem with reference to Group theory.	4	K1
f.	Test whether the permutation $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 1 & 4 & 3 & 5 & 2 & 6 \end{pmatrix}$ is even permutation or odd permutation?	4	K3
g.	Use Pigeonhole principle to find the minimum number of students in a class to be sure that four out of them are born in the same month.	5	K3

SECTION B

2. Attempt any *three* of the following: **07 x 3 = 21**

a.	Let R be a relation in a set of integers Z, defined by $R = \{(x, y): x - y \text{ is divisible by } 6, x \in Z, y \in Z\}$. Justify that R is an equivalence relation or partially ordered relation in Z.	1	K3
b.	Convert the Boolean expression $[(xy' + xz)' + x']$ into Disjunctive normal form and Conjunctive normal form.	2	K2
c.	Check the validity of the following argument: If 2 is an odd number then 4 does not divide 10. Either 11 is not a prime number or 4 divides 10. But 11 is a prime number, therefore 2 is an even number.	3	K3
d.	Prove that the set of all positive rational numbers Q^+ forms an abelian group under the operation $'*'$, defined as $a * b = \frac{ab}{2}$.	4	K4
e.	Solve the following Recurrence relation: $a_r - 7a_{r-1} + 10a_{r-2} = r + 2$ given $a_0 = 1, a_1 = 1$	5	K3

SECTION C

3. Attempt any *one* part of the following: **07 x 1 = 07**

a.	(i) is function $f: R \to R$, given by $f(x) = \cos x$, bijective? Justify. (ii) Let a function : $R \to R$, given by $f(x) = x^2$ then find $f^{-1}(16)$ and $f^{-1}(-16)$.	1	K3
b.	If A, B, C are three sets then show that $(A - B) \times C = (A \times C) - (B \times C)$	1	K2

4. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Let $A = \{1, 2, 3, 4, 6, 8, 9, 12, 18, 24\}$ be any set. The relation $'\preccurlyeq'$ in set A is defined as $x \preccurlyeq y$ when x divides y. Is the set $(A, \preccurlyeq)$ partially ordered set (poset)? If yes, draw the Hasse	2	K3

MCA
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DISCRETE MATHEMATICS

TIME: 3 HRS **M.MARKS: 70**

	diagram for this poset and hence list all the maximal, minimal, greatest and least elements of the poset .		
b.	Draw a logic gate circuit for the following Boolean expression: $[a + (b + c).a'].b' + c.[b.(a + c') + a.(b' + c)]$ Also draw a circuit for the minimized form of above Boolean expression.	2	K3

5. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Test whether the statement $p \Rightarrow (\sim q \vee r)$ is a tautology or a contradiction or a contingency. Also, test whether $p \Rightarrow (\sim q \vee r) \equiv (p \Rightarrow \sim q) \vee (p \Rightarrow r)$.	3	K3
b.	Define quantifiers and its types with suitable examples. Translate each of the following statements into symbols using quantifiers, variables and predicate symbols: (*i*) There is a student who can speak Tamil and who knows C + + (*ii*) There is a student who can speak Tamil but does not know C + + (*iii*) Every student either can speak Tamil or knows C + + (*iv*) No student can speak Tamil or knows C + +	3	K2

6. Attempt any *one* part of the following: **07 x 1 = 07**

a.	If R be a group of real numbers under addition and let R^+ be the group of positive real numbers under multiplication. Let $f: R \to R^+$ be defined as $f(x) = e^x$ then show that f is an isomorphism.	4	K3
b.	Prove that the set $R = \{a + b\sqrt{5} : a, b$ are integers$\}$ is a commutative ring with unity with respect to usual addition and multiplication.	4	K3

7. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Show that $n^2 > (2n + 1)$ for $n \geq 3$ by Mathematical Induction.	5	K3
b.	Find Generating functions of the following numeric functions (*i*) $a_n = n.3^n$, $n \geq 0$ (*ii*) $b_n = \frac{(-1)^n(n+2)(n+1)}{2}$, $n \geq 0$	5	K3

PAPER ID-310751

Subject Code: BMC103

Roll No: 2 5 1 2 7 8 0 1 4 0 0 1 9

MCA
(SEM I) THEORY EXAMINATION 2025-26
PRINCIPLES OF MANAGEMENT & COMMUNICATION

TIME: 3 HRS **M.MARKS: 70**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **02 x 7 = 14**

Q no.	Question	CO	Level
a.	Define Administration.	1	K2
b.	State any two functions of a Manager.	1	K1
c.	What do you understand by Organizational Hierarchy?	2	K3
d.	Define Delegation of Authority.	2	K3,K4
e.	Explain the term "Employee Morale."	3	K5,K6
f.	What is Group Cohesiveness?	4	K1,K3
g.	Define Stress Syllable with an example.	5	K3,K5

SECTION B

2. Attempt any *three* of the following: **07 x 3 = 21**

Q no.	Question	CO	Level
a.	Explain the relevance of Management in modern organizations with examples.	1	K2
b.	Discuss various types of strategies used in the planning process.	1	K1
c.	Describe Herzberg's Two-Factor Theory of Motivation in detail.	3	K5
d.	Write a short note I) inquiry letter ii) complaint letter	3	K3
e.	What is Effective Communication? Explain Semantic and Psychological Barriers.	4	K3

SECTION C

3. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a.	Discuss F.W. Taylor's Scientific Management Theory in detail.	1	K2
b.	Explain the essential roles performed by a successful Manager.	1	K2

4. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a.	Explain how "Organizing" contributes to effective coordination in an enterprise.	2	K3,k4
b.	What are the steps involved in Rational Decision-Making? Discuss them in detail.	2	K3,k4

PAPER ID-310751

Subject Code: BMC103

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MCA
(SEM I) THEORY EXAMINATION 2025-26
PRINCIPLES OF MANAGEMENT & COMMUNICATION

TIME: 3 HRS **M.MARKS: 70**

5. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a.	Explain the various steps of the Controlling Process and discuss modern control tools.	3	K5
b.	Define Leadership. Explain Autocratic, Democratic, and Laissez-faire leadership styles.	3	K5

6. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a.	Describe downward, upward, and horizontal communication with examples. Discuss the need for technical communication.	4	K1,K3
b.	What do you mean by Digital Communication? Discuss its modern tools and benefits.	4	K1,K3

7. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a.	What are the various methods of speech delivery? Explain verbal and non-verbal dimensions.	5	K3,K5
b.	What is a Report? Explain different types of technical reports and their structure.	5	K3,K5

PAPER ID-311483

Subject Code: BMC106

Roll No: 2 5 1 2 7 8 0 1 4 0 0 1 9

MCA
(SEM I) THEORY EXAMINATION 2025-26
CYBER SECURITY

TIME: 3 HRS **M.MARKS: 70**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **02 x 7 = 14**

Q no.	Question	CO	Level
a.	Define Information Security and explain two challenges in securing Information Systems.	CO-1	K1
b.	Describe the need for information security in organizations.	CO-1	K1
c.	What is a Firewall and how does it help in network security?	CO-2	K1
d.	Define Malware. Mention two types and explain one briefly.	CO-2	K1
e.	What is Electronic Commerce? Mention one type of threat associated with it.	CO-3	K1
f.	State the purpose of Security Policies in organizations.	CO-4	K1
g.	Explain the concept of Risk Analysis in Information Systems.	CO-1	K1

SECTION B

2. Attempt any *three* of the following: **07 x 3 = 21**

Q no.	Question	CO	Level
a.	Explain different types of Information Systems and analyze inherent difficulties in securing them.	CO-1	K3
b.	Describe Security Threats such as viruses, worms, Trojan horses, bombs, and traps. Compare their impact.	CO-2	K3
c.	Explain Digital Signatures and their role in securing Electronic Commerce transactions.	CO-3	K3
d.	Discuss the process of developing Security Policies and their importance in organizations.	CO-4	K3
e.	Explain network security measures such as Virtual Private Networks and Intrusion Detection Systems.	CO-2	K3

SECTION C

3. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a.	Explain Confidentiality, Integrity, and Availability. Discuss their importance in Information Security.	CO-1	K3
b.	Analyze the threats to Information Systems and suggest countermeasures.	CO-1	K3

4. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a.	Explain data security considerations related to backup, archival storage, and disposal of data.	CO-2	K3
b.	Describe Security Technology such as Firewalls and VPNs, and explain how they prevent attacks.	CO-2	K3

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MCA
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CYBER SECURITY

TIME: 3 HRS **M.MARKS: 70**

5. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a.	Explain the threats to Electronic Commerce systems and how secure information systems can mitigate them.	CO-3	K3
b.	Describe application development security measures in Electronic Commerce.	CO-3	K3

6. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a.	Explain the types of Security Policies in organizations, such as email, corporate, and sample policies.	CO-4	K3
b.	Analyze the policy review and publication process in detail.	CO-4	K3

7. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a.	Explain the role of physical security and access control in securing IT assets.	CO-4	K3
b.	Discuss CCTV and backup security measures and their importance in organizational security.	CO-4	K3

PAPER ID-310395

Subject Code: BMC105

Roll No: | | | | | | | | | | | | | |

MCA
(SEM I) THEORY EXAMINATION 2025-26
COMPUTER ORGANIZATION & ARCHITECTURE

TIME: 3 HRS **M.MARKS: 70**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **02 x 7 = 14**

Q no.	Question	CO	Level
a.	List the functional units of a digital system.	1	K2
b.	What is a bus cycle? Give one example.	1	K3
c.	Define Booth's algorithm in one line.	1	K2
d.	What is an instruction format?	2	K2
e.	Define 2D memory organization.	3	K2
f.	What is programmed I/O?	4	K1
g.	What is SIMD also Write the full form of SIMD.	5	K1

SECTION B

2. Attempt any *three* of the following: **07 x 3 = 21**

a.	Explain signed-operand multiplication. Using Booth's algorithm, multiply $-13 \times +11$ and show all steps.	1	K3
b.	A memory system contains 128K words and a cache of 1K blocks, each block holding 8 words. For direct mapping, determine: (i) Number of main memory blocks (ii) Word offset bits (iii) Index bits (iv) Tag bits Draw the complete physical address format.	3	K3
c.	Explain instruction cycle with neat diagrams. Write micro-operations for Fetch, Decode, and Execute phases.	2	K3
d.	Describe Flynn's classification. Compare SISD, SIMD, MISD, MIMD with suitable examples.	5	K2
e.	Explain DMA mechanism. Draw the DMA transfer timing for cycle stealing, and justify why CPU performance is affected.	4	K3

SECTION C

3. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Design the architecture of a 3-bus CPU organization and illustrate how the instruction R1 ← R2 + (M[PC]) is executed using register transfer notation.	1	K3
b.	Explain the following addressing modes with examples: (i) Immediate (ii) Direct (iii) Register indirect (iv) Indexed	1	K2

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Roll No: | | | | | | | | | | | | | |

MCA
(SEM I) THEORY EXAMINATION 2025-26
COMPUTER ORGANIZATION & ARCHITECTURE

TIME: 3 HRS **M.MARKS: 70**

4. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Design a 4-bit Carry Look-Ahead Adder and compute: $A = 1101_2$, $B = 0101_2$ Show all intermediate steps for carry generation and sum evaluation.	1	K3
b.	Convert the decimal value –19.375 into IEEE-754 single precision. Show sign, exponent, mantissa, normalization, and biasing.	1	K3

5. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Describe microprogram sequencing. Explain how conditional branching is handled in a microprogrammed control unit using a sequencer diagram.	2	K4
b.	Explain pipelining. For a 5-stage pipeline, show pipeline execution of the instruction sequence: LOAD, ADD, SUB, JUMP Indicate hazards and state one solution.	2	K3

6. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Explain 2½-D memory organization with a neat diagram. How does it improve access time compared to 2D organization?	3	K3
b.	Define virtual memory. Explain page fault, working set, and thrashing with examples.	3	K3

7. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Explain interrupt hardware and interrupt nesting. Draw the sequence of operations during nested interrupt handling.	4	K3
b.	Explain parallel processing. Describe shared-memory MIMD and distributed-memory MIMD architectures with diagrams.	5	K2