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Subject Code: BMC201

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MCA

(SEM. II) THEORY EXAMINATION 2025-26

WEB TECHNOLOGY

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

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

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

(a)	Define HTML and its purpose.	CO-1	K2
(b)	What is CSS?	CO-1	K2
(c)	Define JavaScript variable.	CO-2	K2
(d)	What is DOM?	CO-2	K2
(e)	Define servlet.	CO-3	K2
(f)	What is Spring framework?	CO-4	K2
(g)	Define REST API.	CO-5	K2

SECTION B

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

(a)	Explain HTML forms, tables, and hyperlinks with examples.	CO-1	K3
(b)	Explain JavaScript functions, loops, and conditional statements.	CO-2	K3
(c)	Explain servlet life cycle and HTTP request handling.	CO-3	K3
(d)	Explain Spring dependency injection and bean scopes.	CO-4	K3
(e)	Explain RESTful web services and HTTP methods (GET, POST, PUT, DELETE).	CO-5	K3

SECTION C

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

(a)	Explain HTML structure, tags, lists, and iframe with examples.	CO-1	K4
(b)	Explain CSS selectors, box model, and float/clear concepts.	CO-1	K4

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

(a)	Explain DOM manipulation and event handling in JavaScript.	CO-2	K4
(b)	Explain object creation and block scope variables in JavaScript.	CO-2	K4

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

(a)	Explain session tracking techniques using cookies and HttpSession.	CO-3	K4
(b)	Explain JSP implicit objects, directives, and scripting elements.	CO-3	K4

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

(a)	Explain Spring IoC and AOP concepts with examples.	CO-4	K4
(b)	Explain design patterns (Factory and Strategy) used in Spring.	CO-4	K4

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

(a)	Explain Spring Boot architecture and configuration.	CO-5	K4
(b)	Explain building RESTful web services using Spring Boot with annotations.	CO-5	K4

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Subject Code: BMC204

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MCA

(SEM. II) THEORY EXAMINATION 2025-26

DATABASE MANAGEMENT SYSTEMS

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

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2x7 = 14**

QNo.	Question	CO	Level
(a)	Define database system and its components.	1	K2
(b)	What is data model?	1	K2
(c)	Define relational model.	2	K2
(d)	What is SQL?	2	K2
(e)	Define functional dependency.	3	K2
(f)	What is transaction?	4	K2
(g)	Define locking.	5	K2

SECTION B

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

(a)	Explain DBMS architecture and data independence.	1	K3
(b)	Explain relational algebra operations with examples.	2	K3
(c)	Explain normalization up to 3NF with examples.	3	K3
(d)	Explain serializability and types of schedules.	4	K3
(e)	Explain concurrency control using locking techniques.	5	K3

SECTION C

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

(a)	Explain database system vs file system with advantages of DBMS.	1	K4
(b)	Explain ER model concepts including keys and mapping constraints.	1	K4

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

(a)	Explain SQL queries, joins, and aggregate functions.	2	K4
(b)	Explain integrity constraints and types of keys in relational model.	2	K4

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

(a)	Explain functional dependencies and lossless join decomposition.	3	K4
(b)	Explain normalization using BCNF and multivalued dependencies.	3	K4

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

(a)	Explain log-based recovery and checkpoints.	4	K4
(b)	Explain distributed database system and concurrency control.	4	K4

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

(a)	Explain timestamp-based protocol and validation-based protocol.	5	K4
(b)	Explain multiversion concurrency control and Oracle case study.	5	K4

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Subject Code: BMC203

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MCA

(SEM. II) THEORY EXAMINATION 2025-26

OPERATING SYSTEMS

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

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2x7 = 14**

(a)	What is time-sharing system?	CO-1	K2
(b)	Define multiprocessor system.	CO-1	K2
(c)	What is semaphore?	CO-2	K2
(d)	Define inter-process communication.	CO-2	K2
(e)	What is process scheduling?	CO-3	K2
(f)	Define segmentation.	CO-4	K2
(g)	What is RAID?	CO-5	K2

SECTION B

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

(a)	Explain operating system services and reentrant kernels.	CO-1	K3
(b)	Explain critical section problem and its requirements.	CO-2	K3
(c)	Explain schedulers and process transition diagram.	CO-3	K3
(d)	Explain page replacement algorithms and thrashing.	CO-4	K3
(e)	Explain file directories and file sharing mechanisms.	CO-5	K3

SECTION C

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

(a)	Explain layered structure and system components of operating system.	CO-1	K4
(b)	Explain classification of operating systems with suitable examples.	CO-1	K4

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

(a)	Explain semaphores and test-and-set operation with examples.	CO-2	K4
(b)	Explain producer-consumer problem using synchronization.	CO-2	K4

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

(a)	Explain process address space and process identification information.	CO-3	K4
(b)	Explain deadlock characterization and necessary conditions.	CO-3	K4

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

(a)	Explain demand paging and locality of reference.	CO-4	K4
(b)	Explain cache memory organization and performance.	CO-4	K4

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

(a)	Explain I/O buffering and disk scheduling algorithms.	CO-5	K4
(b)	Explain file system implementation and protection mechanisms.	CO-5	K4

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Subject Code:BMC205

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MCA

(SEM. II) THEORY EXAMINATION 2025-26

DATA STRUCTURES & ANALYSIS OF ALGORITHMS

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 data structure and its types.	1	K2
b.	What is asymptotic notation?	1	K2
c.	Define sparse matrix.	1	K2
d.	What is stack ADT?	2	K2
e.	Define binary search.	2	K2
f.	What is graph?	3	K2
g.	Define AVL tree.	4	K2

SECTION B

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

Q no.	Question	CO	Level
a.	Explain algorithm properties and performance analysis with asymptotic notations.	1	K3
b.	Explain singly and doubly linked lists with operations.	1	K3
c.	Explain stack applications: infix to postfix conversion and evaluation.	2	K3
d.	Explain sorting algorithms: selection sort and bubble sort with comparison.	3	K3
e.	Explain divide and conquer and greedy approach with suitable examples.	5	K3

SECTION C

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

Q no.	Question	CO	Level
a.	Derive index formula for 2D array in column-major order with example.	1	K4
b.	Explain circular linked list and its operations with diagram.	1	K4

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

Q no.	Question	CO	Level
a.	Explain recursion with Fibonacci series and Tower of Hanoi.	2	K4
b.	Explain queue operations and circular queue implementation.	2	K4

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MCA

(SEM. II) THEORY EXAMINATION 2025-26

OBJECT ORIENTED PROGRAMMING

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

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2x7 = 14**

QNo.	Question	CO	Level
(a)	Define abstraction and encapsulation.	1	K2
(b)	What is Java Virtual Machine (JVM)?	1	K2
(c)	Define inheritance and polymorphism.	2	K2
(d)	What is package in Java?	2	K2
(e)	Define exception handling.	3	K2
(f)	What is multithreading?	4	K2
(g)	Define event handling in Java.	5	K2

SECTION B

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

(a)	Explain Java features and program structure.	1	K3
(b)	Explain interfaces and packages with examples.	2	K3
(c)	Explain exception hierarchy and user-defined exceptions.	3	K3
(d)	Explain thread creation and synchronization.	4	K3
(e)	Explain AWT event handling and adapter classes.	5	K3

SECTION C

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

(a)	Explain OOP concepts with Java examples.	1	K4
(b)	Explain constructors, methods, and control flow statements.	1	K4

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

(a)	Explain abstract classes and inner classes.	2	K4
(b)	Explain CLASSPATH, JAR files, and java.net package.	2	K4

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

(a)	Explain exception handling with try-catch-finally.	3	K4
(b)	Explain file handling using byte and character streams.	3	K4

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

(a)	Explain thread life cycle and inter-thread communication.	4	K4
(b)	Explain generic classes and methods with examples.	4	K4

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

(a)	Explain graphics programming using AWT.	5	K4
(b)	Explain Swing components and layout management.	5	K4