

For Library Use



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UNIVERSITY OF NORTH BENGAL

B.Sc. Major 4th Semester Examination, 2025

UCMSMAJ24006-COMPUTER SCIENCE

DATA BASE MANAGEMENT SYSTEM (DBMS)

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

GROUP-A

1. Answer any *five* questions:

1×5 = 5

- What is Primary Key?
- Define (i) Entity (ii) Attribute
- What is Cardinality?
- What is Deadlock?
- List all the commands used in DCL.
- How do you write a SQL query to modify a data in a table?
- What is an instance in Database?
- List down any two role of DBA.

GROUP-B

2. Answer any *three* questions:

5×3 = 15

- List down the advantages of a DBMS, and how does it differ from a file management system?
- Explain about Integrity Constraints over relations in detail.
- Design ERD of library management system.
- Explain the concept of join operations in relational algebra.

GROUP-C

3. Answer any *two* questions:

10×2 = 20

- Compare and contrast the Hierarchical network and Relational models.
- What are the ACID properties in a database, and why are they important?
- Determine the closer of the following set of functional dependencies for a relational scheme $R(A, B, C, D, E), F = \{A \rightarrow BC, CD \rightarrow E, B \rightarrow D, E \rightarrow A\}$. List out the candidate keys of R.
- What is normalization? What are the conditions required for a relation to be in 1NF, 2NF and 3NF explain with examples.

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UNIVERSITY OF NORTH BENGAL

B.Sc. Major 4th Semester Examination, 2025

UCMSMAJ24007-COMPUTER SCIENCE

SOFTWARE ENGINEERING

Time Allotted: 2 Hours 30 Minutes

Full Marks: 60

The figures in the margin indicate full marks.

GROUP-A

Answer any four of the following

3×4 = 12

- | | | |
|----|---|---|
| 1. | What is SRS? | 3 |
| 2. | Define SPM. | 3 |
| 3. | What is alpha testing and beta testing? | 3 |
| 4. | Define Entity Relationship Diagram (ERD). | 3 |
| 5. | What is software risks? | 3 |
| 6. | Discuss about Software quality. | 3 |

GROUP-B

Answer any four of the following

6×4 = 24

- | | | |
|-----|---|---|
| 7. | Discuss about different types of categories of software according to COCOMO estimation model. | 6 |
| 8. | Write a short note on Software characteristics. | 6 |
| 9. | Give a brief overview of RMMM model. | 6 |
| 10. | Discuss about Black-Box testing and White-Box testing. | 6 |
| 11. | With proper example discuss about Data Flow Diagram (DFD). | 6 |
| 12. | Discuss the differences between Software Verification and Software Validation. | 6 |

GROUP-C

Answer any two of the following

12×2 = 24

- | | | |
|-----|---|----|
| 13. | Write a detailed overview of Spiral model. | 12 |
| 14. | Write a short note on Capability Maturity Model Integration (CMMI). | 12 |
| 15. | Discuss about characteristics of SRS. | 12 |
| 16. | Explain about cohesion and coupling. | 12 |

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UNIVERSITY OF NORTH BENGAL

B.Sc. Major 4th Semester Examination, 2025

UCMSMAJ24008-COMPUTER SCIENCE

PROGRAMMING IN JAVA

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

GROUP-A

Answer any five questions

1×5 = 5

1. What is a class and object?
2. What is the use of 'Super' keyword?
3. What is JVM?
4. How is constant declared in Java?
5. What is 'this' in Java?
6. What is an 'interface'?
7. What is the use of import statement in Java?
8. How do you compile and run a Java source file?

GROUP-B

Answer any three questions

5×3 = 15

9. Explain polymorphism with the help of an example.
10. What is the use of wrapper classes? Explain with example.
11. Where do you use 'extend' and 'implements'? Explain with example.
12. Explain data abstraction and encapsulation.
13. Why Java code is called 'write once, run anywhere'. Explain.

GROUP-C

Answer any two questions

10×2 = 20

14. Explain the two ways of creating a thread with appropriate example.
15. Explain the concept of exception handling in Java. How does Java handle exception and what are the key components involved? 4+6
16. What is inheritance? Explain the different types of inheritance with examples.
17. Describe the different features of Java.

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UNIVERSITY OF NORTH BENGAL

BCA Major 4th Semester Examination, 2025

UBCAMAJ24006-BACHELOR OF COMPUTER APPLICATION

RELATIONAL DATABASE MANAGEMENT SYSTEM

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

GROUP-A

Answer any five questions

1×5 = 5

1. What is an Entity-Relationship (ER) model?
2. What is join?
3. What is derived attribute?
4. What is SQL?
5. What is primary key?
6. How do you write a SQL query to select all records from a table?
7. What is schema in Database?
8. Write an aggregate function in SQL?

GROUP-B

Answer any three questions

5×3 = 15

9. What is DBMS? How does it differ from a file management system?
10. Discuss the ACID properties in a database.
11. What are the different normal forms, and why are they used?
12. Explain the different types of Keys in DBMS.
13. Explain the different symbols used in ER Diagram.

GROUP-C

Answer any two questions

10×2 = 20

14. Explain Set operations of Relational Algebra in DBMS with examples.
15. Relation R(A, B, C, D, E, F, G, H), F = {AB → C, BD → EF, AD → G, A → H}. List the candidate keys of R.
16. What is normalization? What are the conditions required for a relation to be in 1NF, 2NF and 3NF explain with examples.
17. Compare Hierarchical Model, Network Model and Relational Model with suitable example.

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UNIVERSITY OF NORTH BENGAL

BCA Major 4th Semester Examination, 2025

UBCAMA J24007-BACHELOR OF COMPUTER APPLICATION**SOFTWARE ENGINEERING**

Time Allotted: 2 Hours 30 Minutes

Full Marks: 60

*The figures in the margin indicate full marks.***GROUP-A****Answer any four of the following**

3×4 = 12

- | | | |
|----|---|---|
| 1. | What is software process? | 3 |
| 2. | What is Entity Relationship Diagram (ERD)? | 3 |
| 3. | Define alpha-testing and beta testing and acceptance testing. | 3 |
| 4. | What is SRS? What are the characteristics of SRS? | 3 |
| 5. | What is ISO 9000 certification? | 3 |
| 6. | What are testing principles of testing in software engineering? | 3 |

GROUP-B**Answer any four of the following**

6×4 = 24

- | | | |
|-----|--|---|
| 7. | Write a brief overview of Black-Box testing and White-Box testing. | 6 |
| 8. | Discuss about Data Flow Diagram (DFD) with an example. | 6 |
| 9. | Write in detail about fact finding techniques. | 6 |
| 10. | Briefly discuss about Risk identification and Risk management. | 6 |
| 11. | Discuss about software quality. | 6 |
| 12. | Write a brief overview of COCOMO model. | 6 |

GROUP-C**Answer any two of the following**

12×2 = 24

- | | | |
|--------|--|-----|
| 13. | Briefly discuss the differences between Software Verification and Software Validation. | 12 |
| 14. | Explain briefly about coding guidelines and coding standards. | 12 |
| 15. | Write in detail about the Iterative waterfall model. | 12 |
| 16.(a) | What are the various project estimation techniques in Software Engineering? | 6+6 |
| (b) | Make an ERD for Library Management System. | |

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UNIVERSITY OF NORTH BENGAL

BCA Major 4th Semester Examination, 2025

UBCAMAJ24008-BACHELOR OF COMPUTER APPLICATION

PROGRAMMING IN JAVA

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

GROUP-A

Answer any five questions

1×5 = 5

1. What is the use of 'static' keyword in Java?
2. What is Garbage collection?
3. What is the use of import statement in Java?
4. What is an abstract class?
5. Differentiate – printf(), println() and print().
6. Differentiate 'break' and 'continue'.
7. Explain how 'int' is different from 'Integer' in Java.
8. What is 'this' keyword?

GROUP-B

Answer any three questions

5×3 = 15

9. Explain encapsulation with example.
10. Write a program to count number of objects created of a particular class.
11. Write a program to illustrate command line input in Java.
12. Explain why main function is written as 'public static void main (string[] args)'.
13. Discuss string equality with the help of an example.

GROUP-C

Answer any two questions

10×2 = 20

14. Explain polymorphism with a suitable example in Java.
15. What is multithreading? Illustrate with an example in Java.
16. Implement a GUI window and illustrate a button event to display a message. You may use an Applet, or Swing or AWT to create the GUI.
17. How applets differ from application program? Explain the concept of method overriding in Java. Differentiate overloading and overriding in Java with suitable examples.

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UNIVERSITY OF NORTH BENGAL
BCA Honours 4th Semester Examination, 2025

CC10-BACHELOR OF COMPUTER APPLICATION (43)
DATABASE MANAGEMENT SYSTEMS

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

GROUP-A

Answer any five questions

1×5 = 5

1. Define a candidate key.
2. What is granularity of a data item?
3. What is view?
4. Write the full form of ACID in DBMS.
5. Write two characteristics in database system.
6. What is deadlock in DBMS?
7. Which SQL command is used to delete a table?
8. Define relational algebra.

GROUP-B

Answer any three questions

5×3 = 15

9. Explain BCNF with an example.
10. Explain the role of database administrator.
11. Explain the merits and demerits of database system.
12. Discuss two levels of data independence.
13. Explain the concept of B+ tree.

GROUP-C

Answer any two questions

10×2 = 20

14. Write short notes on:
(i) DDL, (ii) DML, (iii) Database Schema
15. Briefly describe the 3-tier architecture in DBMS. Explain with suitable diagram.
16. Draw an ER diagram of a Library Management System.
- 17.(a) Describe Wait/Die and Wound/Wait deadlock protocols.
(b) Write and explain the structure of SQL SELECT statement with suitable example.

3+3+4

6+4

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UNIVERSITY OF NORTH BENGAL
BCA Honours 4th Semester Examination, 2025

SEC1-P2-BACHELOR OF COMPUTER APPLICATION (45)

Time Allotted: 2 Hours

Full Marks: 60

*The figures in the margin indicate full marks.
All symbols are of usual significance.*

**The question paper contains SEC45:E1 and SEC45:E2 and SEC45:E3
The candidates are required to answer any *one* from *three* courses.
Candidates should mention it clearly on the Answer Book.**

SEC45:E1

ANDROID PROGRAMMING

GROUP-A

Answer any *four* questions

3×4 = 12

1. What is fragment?
2. Define services in Android Operating System.
3. Explain and expand the term JVM.
4. Discuss the directory structure of an Android Project.
5. Explain overloading.
6. Write a note on Android Development Environment.

GROUP-B

Answer any *four* questions

6×4 = 24

7. Develop an APP and make use of checkbox and radio buttons.
8. Describe the Android command line tools.
9. List features of Android Operating System.
10. Explain any four UI components of Android application.
11. What is AVD? Explain the internal architecture of AVD.
12. Write a short note on Intents.

GROUP-C

Answer any *two* questions

12×2 = 24

13. Develop a simple calculator using table layout.
14. Describe the significance of SQLite database in Android.
15. Briefly discuss about android platform architecture with appropriate diagram.
16. Write a short note on History and Evolution of Android versions with its major features.

SEC45:E2

PROGRAMMING IN MATLAB

GROUP-A

Answer any four of the following

3×4 = 12

1. What is MATLAB?
2. What is Machine code?
3. Explain the data types used in MATLAB.
4. What are assignment statements?
5. Write the code in MATLAB to find the transpose of a matrix.
6. How to plot a graph in MATLAB?

GROUP-B

Answer any four of the following

6×4 = 24

7. Demonstrate arguments and return values in MATLAB with the help of an example.
8. Discuss MATLAB windows and expressions in MATLAB with the help of examples.
9. Explain waveforms in MATLAB with the help of examples.
10. Draw a graph that joins the points (1, 0), (5, 4) and (2, 1).
11. Write down the steps to write a program in MATLAB and execute it.
12. Explain different types of loops in MATLAB with the help of example.

GROUP-C

Answer any two of the following

12×2 = 24

13. With the help of a diagram discuss Software Hierarchy.
14. Write a program in MATLAB to read a text file containing integers and search a particular item from the list using binary search.
15. Write a program in MATLAB to find out the inverse of a matrix.
16. Discuss different types of branching statements used in MATLAB with the help of examples.

SEC45:E3

VB.NET PROGRAMMING

GROUP-A

Answer any four questions

3×4 = 12

1. Explain OLE.
2. What are the components of the .NET framework?
3. Explain the structure of ADO.NET.

4. Describe error handling mechanism in VB.NET.
5. Explain the use of Val() and Str() functions.
6. Discuss class library with reference to .NET framework.

GROUP-B

Answer any *four* questions

6×4 = 24

7. Discuss the properties and methods of Radio button and Checkbox.
8. Discuss the use of timer control with different events and properties.
9. What are MDI forms? Write the properties of PARENT and CHILD forms.
10. What is garbage collection in VB.NET? Discuss it.
11. Explain some basic data types in VB.NET.
12. Write the codes for the following:
 - (a) To add a string in a ListBox
 - (b) To delete a given string from a ListBox.
 - (c) To check if a given string is present in a ListBox or not.

GROUP-C

Answer any *two* questions

12×2 = 24

13. Write code in VB.NET to create a console application that determines whether a number is prime or not.
14. Write a program in VB.NET to implement RGB color combination using scroll bars.
15. Explain different types of conditional statements and iterative statements used in VB.NET using suitable examples.
16. Write short notes on:
 - (a) Immediate Window
 - (b) Tool Box
 - (c) MENU BAR
 - (d) FORM LAYOUT.

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