D–4496

Sub. Code
31311

DISTANCE EDUCATION

M.Sc. (IT) DEGREE EXAMINATION, MAY 2024.

First Semester

COMPUTER ORGANIZATION AND ARCHITECTURE

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What is the purpose of digital computers?

2. Define logic gates.

3. Define combinational circuits.

4. What are flip-flops used for in digital circuits?

5. Explain the role of multiplexers in digital circuits.

6. Define registers in the context of digital components.

7. Describe the process of bus and memory transfers in register transfer.

8. What are arithmetic microoperations in computer organization?

9. What are the different instruction codes in computer organization?

10. Describe the role of computer registers.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) Design a 4-to-16 line decoder using two 3-to-8 line decoders.

Or

(b) Explain the concept of a flip-flop and compare different types of flip-flops.

12. (a) Convert the decimal number 25 into binary, octal and hexadecimal representations.

Or

(b) Perform 2's complement arithmetic to subtract two signed binary numbers : 10110 – 01101.

13. (a) Explain the concept of a memory reference instruction and its components.

Or

(b) Design an instruction format for a hypothetical computer architecture with three address fields.

14. (a) Perform binary multiplication using the Booth's algorithm for the numbers 1101 and 1010.

Or

(b) Implement a division algorithm using restoring division for the numbers 101011 (quotient) and 1101 (divisor).

15. (a) Compare the advantages and disadvantages of different memory hierarchies.

Or

(b) Discuss the concept of associative memory and its use in address translation.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the operation of a flip-flop and design a sequential circuit using flip-flops.

17. Describe the concept of register transfer language and design a register transfer circuit for a specific task.

18. Design a simple central processing unit (CPU) with specific register organization and addressing modes.

19. Discuss the input-output organization in computer systems.

20. Explain the concept of cache memory and discuss its role in improving system performance.

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D–4497

Sub. Code
31312

DISTANCE EDUCATION

M.Sc. (IT) DEGREE EXAMINATION, MAY 2024.

First Semester

OBJECT ORIENTED PROGRAMMING AND JAVA

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Define Object-Oriented Programming (OOP) and discuss its benefits.

2. How does Java differ from C and C++? Highlight the features that make Java unique.

3. Define Class.

4. What is method overloading in Java?

5. What is a thread in Java?

6. What is the life cycle of a thread in Java?

7. Define exceptions in Java.

8. How do you handle multiple exceptions using the catch statement in Java?

9. What are streams in Java?

10. How to read and write characters using Java I/O classes?

PART B — ($5 \times 5 = 25$ marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) Explain the concepts of inheritance in object-oriented programming and provide an example demonstrating single inheritance.

Or

(b) Discuss the significance of constructors in Java classes and explain the difference between default constructors and parameterized constructors.

12. (a) Define and explain the concept of encapsulation in Java.

Or

(b) Discuss the concept of interfaces in Java.

13. (a) Explain the difference between a process and a thread in Java.

Or

(b) Discuss the concept of thread synchronization in Java.

14. (a) Describe the purpose and functionality of Java exceptions.

Or

(b) Explain the concept of exception handling in Java.

15. (a) Explain the concept of streams in java and discuss the difference between byte stream classes and character stream classes.

Or

(b) Describe the process of reading and writing characters to files in Java using the appropriate stream classes.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the role of Java applets and their life cycle in web development.

17. Implement a Java program that utilizes arrays, strings and vectors. Provide examples.

18. Discuss the advantages and challenges of multithreaded programming.

19. Design and implement a Java applet that utilizes graphics programming to create interactive visual elements.

20. Explain the advantages and limitations of random access files compared to other file handling methods.

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D–4498	Sub. Code
	31313

DISTANCE EDUCATION

M.Sc. (IT) DEGREE EXAMINATION, MAY 2024.

First Semester

DATA STRCTURES AND ALGORITHMS

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Name the two main types of data structures.

2. Define primitive data types in programming.

3. Define an array.

4. Differentiate between one-dimensional and multi-dimensional arrays.

5. What is a Stack?

6. What are the advantages of circular queue?

7. Define binary trees and their types.

8. How are binary trees represented in memory?

9. What is linear search algorithm?

10. Define a bubble sort algorithm.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) Describe the time and space complexity of algorithms. Compare the complexity of linear and binary search algorithms.

Or

(b) Discuss the different types of data types in programming.

12. (a) Implement a singly linked list and demonstrate the insertion and deletion of nodes.

Or

(b) Design a circular queue using an array and illustrate its implementation.

13. (a) Implement a hash table for storing string data and handle collisions using open addressing.

Or

(b) Compare and contrast Breadth-First Search and Depth-First Search algorithms.

14. (a) Implement binary search on a sorted array of characters and demonstrate its working.

Or

(b) Describe the process of using a hash table for searching and explain its advantages and disadvantages.

15. (a) Design a program to perform insertion sort on a list of strings in alphabetical order.

Or

(b) Describe the process of radix sort algorithm with suitable example.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the importance of data structures in computer programming. Describe two different types of data structures and provide examples of each.

17. Design a program to implement a stack using an array. Discuss the operations of the stack and demonstrate its usage with suitable examples.

18. Illustrate a binary tree with nodes containing integer data. Perform different tree traversal methods on the tree.

19. Compare and contrast linear search and binary search algorithms. Provide examples and discuss their time complexities.

20. Develop a program to implement the bubble sort algorithm. Analyze its time complexity and discuss its advantages and limitations in sorting large datasets.

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D–4499

Sub. Code
31321

DISTANCE EDUCATION

M.Sc. (Information Technology) DEGREE EXAMINATION, MAY 2024.

Second Semester

DATA MINING AND WAREHOUSING

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. What is OLAP?

2. List out various of data.

3. Define association rule mining.

4. What is back propagation?

5. List the use of clustering.

6. Define the unsupervised learning.

7. Why we need text mining?

8. List out various tools of data mining.

9. What do you mean by big data analytics?

10. What is Hadoop?

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Elucidate the data warehouse schema.

Or

(b) How do you use data cleaning in data mining?

12. (a) Evaluate the methods to discover association rule.

Or

(b) Discuss about the Bayesian classification.

13. (a) Describe about categorical clustering algorithms.

Or

(b) Elucidate the machine learning.

14. (a) Give a note on web structure mining.

Or

(b) Discuss about knowledge mining.

15. (a) Explain various types of big data.

Or

(b) List out the Hadoop limitations.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Elucidate the data warehousing architecture.

17. Evaluate the FP tree growth algorithm.

18. Give an account on working of Genetic algorithm.

19. Write a note on Weka and Rapid Miner.

20. Explain about the physical architecture of Hadoop.

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D–4500

Sub. Code
31322

DISTANCE EDUCATION

M.Sc. (Information Technology) DEGREE EXAMINATION, MAY 2024.

Second Semester

RELATIONAL DATABASE MANAGEMENT SYSTEM (RDBMS)

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. Outline the ER model.

2. What is meant by relational model?

3. Define logical database design.

4. Write a note on tuple relational calculus.

5. Define rules for 1NF.

6. What is lossless join decomposition?

7. Summarize the testing for serializability.

8. Explain buffer management.

9. Define index data structures.

10. Outline the tree based indexing.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Explain database system structure.

Or

(b) Summarize about relationships and relationship sets.

12. (a) Demonstrate the altering tables.

Or

(b) Explain domain relational calculus.

13. (a) Explain the schema refinement in database design.

Or

(b) Explain logical connectivity's with example.

14. (a) Explain the serializability and recoverability.

Or

(b) Explain log based recovery.

15. (a) Elaborate hash based indexing.

Or

(b) Explain dynamic index structure.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain about storage manager and query processor.

17. Elaborate the views and altering views with example.

18. Demonstrate the sql triggers and active databases.

19. Elaborate lock based protocols.

20. Illustrate the index data structure and tree base indexing.

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D–4501

Sub. Code
31323

DISTANCE EDUCATION

M.Sc. (Information Technology) DEGREE EXAMINATION, MAY 2024.

Second Semester

VISUAL PROGRAMMING WITH .NET

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Write about StatusBar.

2. What is standard toolbar in Visual Studio?

3. List out primitive types in C#.

4. Define Inheritance.

5. What is called Events?

6. Write about Default Namespace.

7. List out the uses of immediate window.

8. Define Tables.

9. Write about DockPanel Layout in WPF.

10. Define Data Source.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Write a short note on Toolbar in Visual Studio.

Or

(b) Explain about Web Projects.

12. (a) Demonstrate IF-Else Statement using C#.NET

Or

(b) Write a short note on Declaring and using Properties in Visual Studio.

13. (a) Comment on Delegates.

Or

(b) Describe on Target Framework.

14. (a) What is called the Call Stack Window? Explain it.

Or

(b) Write about Server Explorer.

15. (a) How to Configure ComboBox using WPF Controls?

Or

(b) Write steps to design Silverlight applications.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Briefly explain about menus in visual studio.

17. How to create classes in C#.NET? Explain it.

18. Comment on Compiling Applications and Rebuilding Projects.

19. How to create database in visual studio? Give an example.

20. Demonstrate use of DataGrid with example application.

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D–4502

Sub. Code
31331

DISTANCE EDUCATION

M.Sc. (IT) DEGREE EXAMINATION, MAY 2024.

Third Semester

OPEN SOURCE SOFTWARE

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. List out the logical operators in PHP.

2. Difference between list and tuple.

3. Expand Perl.

4. What is a subroutine?

5. Write the syntax for SELECT command in SQL.

6. How do you define a function in Python?

7. List few packages in Perl.

8. How you create and use array in PHP?

9. List the features of open source software.

10. Describe about conditional operators in Perl.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) Explain how to manipulate files and directories.

Or

(b) Explain the features of MYSQL.

12. (a) What is open source? List the advantages of open source.

Or

(b) Illustrate how to add and edit records in MYSQL.

13. (a) Write a Python program to check if the input year is a leap year or not.

Or

(b) Describe about different types of loops in Perl with example.

14. (a) How will you handle files in PHP? Explain.

Or

(b) Explain about Dictionaries in Python.

15. (a) Explain debugging and error handling features in PHP.

Or

(b) What is a subroutine? How do you create subroutine in python?

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the operation cloning and signaling in Linux.

17. Describe the concept of record selection technology with a suitable example.

18. Illustrate the way to create PHP connectivity with SQL database.

19. Discuss about the package and module in Perl.

20. Explain about conditional and loop structures in python.

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D–4503

Sub. Code
31332

DISTANCE EDUCATION

M.Sc. (IT) DEGREE EXAMINATION, MAY 2024.

Third Semester

OPERATING SYSTEMS

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Define Operating System.

2. What are the main components of the Computer System Architecture?

3. Define Process Concept.

4. What is the significance of Process Scheduling?

5. Define Semaphores.

6. What is the Critical Section Problem?

7. Define Swapping and Paging in Memory Management.

8. Define Contiguous Memory Allocation.

9. List the main components of File System.

10. What are the different Access methods used to access files in an Operating System?

PART B — ($5 \times 5 = 25$ marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) Explain the concept of Operating System Operations.

Or

(b) Discuss the key functions of an Operating System and how they contribute to the smooth operation of a computer system?

12. (a) Discuss the advantages and disadvantages of using multiple processors for process scheduling in a multi-core system.

Or

(b) What is Process Scheduling? Compare different process scheduling algorithms.

13. (a) Explain the role of Synchronization Hardware in an OS and how it aids in process coordination?

Or

(b) Compare and contrast the classic problems of synchronization.

14. (a) Compare the advantages and disadvantages of contiguous Memory Allocation and Paging.

Or

(b) Explain the concept of Segmentation and its implementation in an OS.

15. (a) Define the File Concept and the different access methods used in file management.

Or

(b) Compare and contrast the different File Allocation methods.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the structure of an Operating System and the role of each component in managing computer resources.

17. Describe the concept of Inter-Process Communication and the various mechanisms used for it.

18. Analyse the critical section problem and its solution using semaphores and monitors.

19. Explain how memory Scheduling algorithms work and their significance in improving system performance.

20. Explain the directory structure and file system mounting process in detail.

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D–4504

Sub. Code
31333

DISTANCE EDUCATION

M.Sc. (IT) DEGREE EXAMINATION, MAY 2024.

Third Semester

COMPUTER NETWORKS

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Define Computer Networks.

2. Differentiate between LAN, MAN and WAN in terms of coverage.

3. Define cyclic redundancy check.

4. What is the significance of data link layer?

5. Define circuit switching.

6. What is packet switching?

7. Define UDP and TCP in process-to-process delivery.

8. What is the key functioning of transport layer?

9. Define cryptography.

10. What is encryption?

PART B — ($5 \times 5 = 25$ marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) Compare half-duplex and full-duplex transmission modes and their applications in network communication.

Or

(b) Describe the role of repeaters, hubs, bridges and switches in network communication.

12. (a) Explain the concept of multiple access protocols.

Or

(b) Discuss the role of MAC addresses in data link layer.

13. (a) Describe the functions of the network layer in routing and forwarding packets.

Or

(b) Compare and contrast static routing and dynamic routing algorithms.

14. (a) Explain the role of port numbers in transport layer addressing.

Or

(b) Describe the process of establishing and terminating a TCP connection using three-way handshake.

15. (a) Discuss the basic principles of cryptography.

Or

(b) Describe the concept of public-key infrastructure (PKI).

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Describe the various types of transmission media used in computer networks and compare their performance characteristics.

17. Compare and contrast stop-and-wait protocol and sliding window protocol for flow and error control.

18. Explain about circuit switching, packet switching, and message switching.

19. Explain the differences between UDP and TCP in terms of connection-oriented vs. connectionless services, reliability and error recovery mechanisms.

20. Describe the principles of symmetric key cryptography.

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D–4505

Sub. Code
31341

DISTANCE EDUCATION

M.Sc. (IT) DEGREE EXAMINATION, MAY 2024.

Fourth Semester

WEB TECHNOLOGY

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. List three common HTML tags.

2. Explain the role of Cascading Style sheets (CSS) in web design.

3. Define Java Beans and list some of its advantages.

4. Explain the purpose of Bound properties in Java Beans.

5. Describe the lifecycle of a Servlet.

6. What are the core packages provided by Javax.servlet?

7. Describe Java Server Pages.

8. Describe the anatomy of a JSP page.

9. How does JDBC facilitate database programming in Java web applications?

10. Discuss the use of javax.sql*package.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) Explain the basic structure of an HTML document.

Or

(b) Discuss the advantages of using Cascading Style Sheets (CSS) to control the presentation of a website.

12. (a) Describe the concept of introspection in Java Beans.

Or

(b) Explain how to enables tools to analyze and manipulate beans at runtime.

13. (a) Illustrate the steps to design Servlet-based web application that allows users to upload images and store them on the server.

Or

(b) Explain the lifecycle of a Servlet.

14. (a) Discuss the purpose of JSP tags such as jsp:include, jsp:use Bean and jsp:set Property.

Or

(b) Compare the benefits of using Java Beans in JSP pages.

15. (a) Explain the role of JDBC in database access.

Or

(b) Discuss the advantages of using prepared statements over simple SQL statements in Java applications.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Compare and contrast Document Type Definition (DTD) and XML Schemas.

17. Analyze the significance of Bound properties and constrained properties in Java Beans.

18. Compare different session tracking mechanisms in web applications.

19. Discuss the benefits and drawbacks of using Java Server Pages (JSP) over traditional Servlets for developing web applications.

20. Explain the key components of the Struts framework.

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D–4506

Sub. Code
31342

DISTANCE EDUCATION

M.Sc. (IT) DEGREE EXAMINATION, MAY 2024.

Fourth Semester

SOFTWARE ENGINEERING

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Define Software.

2. Explain the Capability Maturity Model Integration (CMMI).

3. List requirement engineering tasks.

4. How do you validate software requirements?

5. Explain software architecture.

6. What is the design engineering process?

7. Compare unit testing and integration testing.

8. What is the art of debugging?

9. Differentiate proactive and reactive risk strategies.

10. Describe risk identification.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) Discuss the role of software in modern computer systems and debunk common software myths.

Or

(b) Explain the capability Maturity Model Integration (CMMI) and its significance in software process assessment.

12. (a) Explain the requirement engineering tasks and the process involved in validating requirements.

Or

(b) Describe the different modeling techniques.

13. (a) Discuss the design process and quality in software engineering.

Or

(b) Explain the concepts of software architecture and data design in the architectural design phase.

14. (a) Compare and contrast different testing strategies.

Or

(b) Explain the process of black-box and white-box testing.

15. (a) Explain the differences between reactive and proactive risk strategies.

Or

(b) Describe the process of risk identification and risk projection.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Discuss the different process models in software engineering.

17. Explain the steps involved in building an analysis model during requirement engineering.

18. Compare and contrast architectural design and user interface design.

19. Discuss the significance of software metrics and how they can be used to measure software quality and process domains.

20. Explain the concept of software quality assurance.

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D–4507

Sub. Code
31343

DISTANCE EDUCATION

M.Sc. (IT) DEGREE EXAMINATION, MAY 2024.

Fourth Semester

CLOUD COMPUTING

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Define Cloud Computing.

2. What are the pros and cons of Cloud Computing?

3. Describe the collaboration on grocery lists using cloud computing.

4. How can cloud computing be used for centralizing email communications?

5. Explore the use of online calendar applications in cloud services.

6. How does cloud computing help in online planning?

7. Define federation.

8. What are the four levels of federation in cloud computing?

9. What are open-source cloud platforms?

10. Mention some examples of open-source cloud platforms.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Elaborate on the benefits and drawbacks of adopting cloud computing for businesses.

Or

(b) Explain the various types of cloud service development tools available and their applications.

12. (a) Discuss the significance of cloud computing in streamlining collaboration for household tasks.

Or

(b) Evaluate the role of cloud-based tools in managing household budgets and to-do lists.

13. (a) Discuss the importance of online word processing and database tools in collaborative environments.

Or

(b) Explain the advantages and disadvantages of using cloud-based project management platforms.

14. (a) Explore the concept of federation in cloud computing and its implications for data sharing.

Or

(b) What are the security challenges and measures required to safeguard sensitive data in the cloud?

15. (a) What are the key features and capabilities of Open Nebula for managing cloud infrastructure?

Or

(b) Write shorts on Amazon S3.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Discuss the evolution of Cloud Computing and its impact on the modern IT landscape.

17. Analyze the challenges and benefits of centralizing email communications using cloud-based solutions.

18. Evaluate the role of online planning and task management tools in enhancing team collaboration.

19. Investigate the concept of federation in cloud computing and its potential impact on interoperability.

20. Compare and contrast the features of Eucalyptus and Nimbus as open-source cloud deployment platforms.

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