D–6489	Sub. Code
	31311

DISTANCE EDUCATION

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

First Semester

COMPUTER ORGANIZATION AND ARCHITECTURE

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What is Boolean algebra used for in digital circuits?
2. Explain map simplification in digital circuits.
3. What are integrated circuits?
4. Describe the function of decoders in digital circuits.
5. What are the different types of data representations?
6. Explain the concept of register transfer language.
7. Define logic microoperations.
8. Explain the purpose of shift microoperations.
9. What is the function of a stack organization in the central processing unit?
10. Explain the concept of addressing modes in computer organization.

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Design a multiplexer circuit to select one of four input signals based on a 2-bit control input.

Or

(b) Simplify the following Boolean expression using Boolean algebra. $F = (A + B) \bullet (A' + C)$.

12. (a) Discuss the difference between little-endian and big-endian byte ordering in computer systems.

Or

(b) Convert the IEEE 754 single-precision floating-point representation 0 10000011 10100000000000000000000 into decimal.

13. (a) Discuss the different addressing modes used in computer instruction sets and provide examples.

Or

(b) Compare the advantages and disadvantages of stack organization and general register organization in a CPU.

14. (a) Explain the concept of floating-point arithmetic and perform addition using IEEE 754 single-precision format.

Or

(b) Discuss the role of input-output interfaces and explain the difference between programmed I/O and interrupt-driven I/O.

15. (a) Explain the purpose and functioning of a Memory Management Unit (MMU).

Or

(b) Design a memory mapping schemes for a 16-bit address space with 4KB of main memory and 16KB of cache memory.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Design a combinational circuit using logic gates to implement a specific Boolean function.

17. Discuss the representation of floating-point numbers in digital systems and perform arithmetic operations on floating-point numbers.

18. Describe the instruction cycle and discuss the timing and control aspects of computer instructions.

19. Implement a multiplication algorithm using a specific technique and discuss its efficiency.

20. Explore the memory hierarchy in computer systems and compare the main memory and auxiliary memory.

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D–6490	Sub. Code
	31312

DISTANCE EDUCATION

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

First Semester

OBJECT ORIENTED PROGRAMMING AND JAVA

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What is Java virtual machine (JVM)?

2. Define type casting.

3. What are arrays in Java? How do you declare and initialize one-dimensional arrays?

4. What are the purpose and usage of wrapper classes in Java?

5. What is thread synchronization?

6. Define multithreading.

7. Discuss the role of the finally statement in exception handling.

8. What are applets in Java?

9. Discuss the concept of random access files in Java.

10. How do you handle input/output exceptions?

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Compare and contrast the concepts of method overloading and method overriding in Java.

Or

(b) Describe the purpose and functionality of the "final" keyword in Java.

12. (a) Demonstrate the usage of arrays in Java. Provide and example program utilizing arrays.

Or

(b) Describe the concept of static members in Java classes.

13. (a) Explain the concept of the Java "Runnable" interface and its significance in multithreaded programming.

Or

(b) Discuss the concept of thread priorities in Java and explain how they affect thread scheduling.

14. (a) Discuss the role of graphics programming in Java applets. Provide an example of drawing shapes in a Java applet.

Or

(b) Describe the process of embedding a Java applet in an HTLM page.

15. (a) Discuss the concept of random access files in Java.

Or

(b) Explain the purpose and functionality of the BufferedReader and BufferedWriter classes in Java.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the OOPs concepts of encapsulation, inheritance and polymorphism. Provide examples.

17. Design and implement a class hierarchy that demonstrate inheritance and method overriding.

18. Develop a multithreaded Java program that illustrates thread creation, synchronization and communication.

19. Explain exception handling and different types of exceptions.

20. Explain the steps involved in handling input/output exceptions and ensuring proper file handling.

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D–6491	Sub. Code
	31313

DISTANCE EDUCATION

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

First Semester

DATA STRUCTURES AND ALGORITHMS

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Define algorithm.

2. How is an array initialized in a program?

3. What is the significance of time and space complexity in algorithms?

4. State one characteristic of an array in data structures.

5. What is a linked list?

6. What operations are possible on a double linked list?

7. Name a few hashing techniques.

8. List some operations that can be performed on a binary search tree.

9. What is the binary search algorithm, and when is it used?

10. Define insertion sort algorithm.

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Explain the concept of data structures and their significance in programming. Provide examples.

Or

(b) Define arrays and explain how they are used to store data in memory. Write a C/C++ code to demonstrate the initialization of a one-dimensional array.

12. (a) Implement a stack data structure using an array and describe its operations.

Or

(b) Create a queue data structure using a linked list and illustrate its functions.

13. (a) Develop a binary tree data structure with integer values and perform an in-order traversal to display the elements in ascending order.

Or

(b) Create a binary search tree with integer values and implement insertion and deletion operations.

14. (a) Describe linear search. Develop a program to perform linear search on an array of integers.

Or

(b) Explain the interpolation search algorithm.

15. (a) Explain bubble sort algorithm with an example.

Or

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

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Analyze the time and space complexity of a sorting algorithm of your choice. Compare it with another sorting algorithm in terms of efficiency and performance.

17. Create a circular queue using linked lists. Illustrate its functionality with appropriate diagrams and explain the benefits of using a circular queue.

18. Implement a hash table for efficient data retrieval.

19. Design an algorithm to perform binary search on a sorted array of elements.

20. Explain insertion sort algorithm and evaluate its performance on various input arrays.

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31321

DISTANCE EDUCATION

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

Second Semester

DATA MINING AND WAREHOUSING

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Name two common techniques used in data mining.

2. Specify categorical and numerical data types in data mining.

3. Define 'lift' in association rules and what it reveals about the strength of an association.

4. What is the main difference between the apriori and FP-Growth algorithms?

5. Differentiate CLARA and CLARANS clustering algorithms.

6. How does the expectation-maximization (EM) algorithm work in unsupervised learning?

7. Mention a common application of text mining in data mining.

8. List a common tool or technique used in visual data mining.

9. Delineate two popular technologies used for managing and analyzing big data in data mining.

10. State how does Hadoop's HDFS contribute to handling large-scale data?

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Discuss the main goals of data mining and explain how it can be used to uncover patterns in large datasets.

Or

(b) Explain the importance of summary statistics in data mining and list the key summary statistics used to describe data.

12. (a) Elucidate the apriori algorithm for discovering association rules. How does it generate frequent item sets and rules?

Or

(b) Discuss how the Pincher search algorithm optimizes the process of pattern discovery compared to traditional algorithms.

13. (a) Compare the effectiveness of K-means and K-medoids in terms of handling outliers and clusters of varying shapes. Provide examples where one algorithm might be preferred over the other.

Or

(b) Provide an example of a data mining problem where combining neural networks with genetic algorithms could be particularly effective. Explain why this hybrid approach is suited for the problem.

14. (a) Compare and contrast temporal mining with traditional data mining approaches. What unique insights does temporal mining provide?

Or

(b) Explicate the role of visualization in data mining with RapidMiner and MATLAB. How do these tools support the visualization of data and mining results?

15. (a) Elucidate the significance of cloud-based big data technologies. Discuss how platforms like AWS, Google Cloud, and Microsoft Azure support big data management and analytics.

Or

(b) Enlighten the physical architecture of Hadoop and describe the roles of its core components.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Elaborate the Euclidean distance metric and its application in measuring similarity between data points.

17. Explain the perception of Bayesian classification in data mining. How does it use Bayes' Theorem to make predictions about class membership?

18. Compare and contrast STIRR, ROCK and CACTUS clustering algorithms in terms of their methodologies and effectiveness in clustering categorical data.

19. Evaluate the role of Weka in model evaluation and performance analysis. What tools does Weka offer for validating the accuracy and robustness of models? Discuss.

20. Illustrate "5 Vs" of big data and their significance in data mining.

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DISTANCE EDUCATION

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

Second Semester

RELATIONAL DATABASE MANAGEMENT SYSTEMS (RDBMS)

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What is database?

2. Define an entity.

3. With an example specify the UNION operation in SQL.

4. Define projection operation in relational algebra.

5. What do you mean by functional dependency?

6. List out the aggregate operators.

7. Specify the ACID properties.

8. Define log record.

9. What do you mean by indexing?

10. What is bucket?

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) What are the various levels of abstractions?

Or

(b) What do you mean by relationship and relationship set?

12. (a) Give and explain the DDL commands with example.

Or

(b) Specify the tuple relation calculus with an example.

13. (a) With an example explain about aggregation operations.

Or

(b) Discuss on third normal form.

14. (a) Give the working principle of time stamp based protocols.

Or

(b) Give the working principle of log based recovery system.

15. (a) Discuss on cluster indexes.

Or

(b) Discuss on hash based indexing.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Draw and explain the architecture of DBMS.

17. Convert any ER diagram into relational model.

18. What do you mean by triggers in SQL?

19. How will you check for deadlock in transactions?

20. Write a note on the redundant arrays of independent disks.

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DISTANCE EDUCATION

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

Second Semester

VISUAL PROGRAMMING WITH .NET

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. What are the benefits of using Visual Studio?

2. What does the Status Bar provide?

3. What is namespace?

4. Write the template code for method snippet.

5. List out the steps to open an interface snippet.

6. Define icon and manifest in project.

7. What are breakpoints?

8. How will you create a database?

9. What is the use of MVC objects?

10. Specify the properties to be set for a control.

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) How will you add components in a toolbox?

Or

(b) How will you access the web projects?

12. (a) Give the use of Accessors with an example.

Or

(b) Discuss on class inheritance.

13. (a) Write a note on the following :

(i) Assemblyname

(ii) Default namespace

(iii) Target framework

(iv) Output type.

Or

(b) How will you manage the dependencies in project?

14. (a) Describe about call stackwindow.

Or

(b) Describe about database diagram.

15. (a) Explain about the GridLayout.

Or

(b) How will you create an Event handler?

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. List out the types of projects and explain them.

17. How will you create and access namespace?

18. Organize any real time project with SolutionExporer.

19. Discuss on stored procedures.

20. Create any application using MVC.

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DISTANCE EDUCATION

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

Third Semester

OPEN SOURCE SOFTWARE

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What is the purpose of open source software?

2. How to declare and initialize a variable in python?

3. Difference between scalar and array in Perl.

4. Define the term “Process”.

5. How can a Perl variable act as a string and a number?

6. List the features of Python.

7. How you create a subroutine in perl?

8. How to create and delete a database in MYSQL?

9. What is typecasting in PHP?

10. Describe the date and time functions in MYSQL.

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Explain about the INSERT, SELECT and UPDATE commands in MYSQL.

Or

(b) What is a process? Explain about the state diagram of a process.

12. (a) Explain about looping statements in PHP.

Or

(b) Describe the data types supported by MySQL.

13. (a) Explain the data types of Perl.

Or

(b) Write a python program to find factorial of a number.

14. (a) Explain subroutines in python.

Or

(b) Discuss about branching statement in PHP.

15. (a) Explain about a few packages in perl.

Or

(b) What is a function? How do you create function in perl?

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain about the scheduling policies in detail.

17. Illustrate the concepts of sequences in Mysql.

18. What are the data types supported by PHP? Explain.

19. Describe functions with suitable example in python.

20. Explain control structures with an example in perl.

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DISTANCE EDUCATION

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

Third Semester

OPERATING SYSTEMS

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. List out the three main operations performed by an operating system.

2. What are the functions of system calls?

3. Define inter-process communication.

4. List the criteria used for process scheduling.

5. What are monitors and how they are used for synchronization?

6. Define deadlocks.

7. What is the purpose of memory scheduling?

8. Define segmentation.

9. What is a file sharing mechanism in a multi-user environment?

10. List the importance of file protection.

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) How does an operating system manage the computer system resources? Explain with example.

Or

(b) Describe the role of system calls in an operating system.

12. (a) How does an operating system handle inter-process communication?

Or

(b) Explain the concept of process creation and termination in an OS.

13. (a) Describe the critical section problem and its significance in concurrent systems.

Or

(b) How do monitors work in managing concurrent access to shared resources?

14. (a) Discuss the concept of swapping in memory management.

Or

(b) Explain virtual memory. How does virtual memory improve the efficiency of memory management?

15. (a) Discuss the structure of a file system directory and its role in organizing files.

Or

(b) How does file system mounting work in an OS?

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Discuss the various functions and services provided by an operating system in detail.

17. Elaborate on the process scheduling algorithms, including their advantages and disadvantages.

18. Compare and contrast the hardware and software-based synchronization mechanisms in an operating system.

19. Discuss the pros and cons of paging and segmentation as memory management techniques.

20. Explain different files allocation methods in detail.

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DISTANCE EDUCATION

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

Third Semester

COMPUTER NETWORKS

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. List the types of line configurations and transmission modes used in computer networks.

2. Name the layers in OSI model.

3. Define framing.

4. What is stop-wait protocol?

5. Define message switching.

6. What is hierarchical routing?

7. Define domain name system.

8. What is remote logon?

9. Define symmetric key cryptography.

10. What is asymmetric key cryptography?

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Discuss the advantages and disadvantages of different network topologies.

Or

(b) Explain the OSI layer model and its significance.

12. (a) How does error detection using cyclic redundancy check (CRC) work, and what are its limitations?

Or

(b) Explain about stop-and-wait protocol.

13. (a) Explain the difference between datagram and virtual circuit switching.

Or

(b) Discuss the significance of subnetting and how it helps in optimizing network performance.

14. (a) How does UDP ensure process-to-process delivery of data?

Or

(b) Discuss the features of TCP that provide reliable and ordered data delivery.

15. (a) Explain the working of symmetric key encryption algorithms.

Or

(b) Write short notes on digital signatures.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the difference between analog and digital signals in network communication.

17. Discuss the principles of multiple access protocols and explain their applications.

18. Describe the functioning of routing algorithms and discuss their applications.

19. Discuss the applications and services provided by the domain name system (DNS) and its role in converting domain names to IP addresses.

20. Explain the concepts of asymmetric key cryptography and discuss its applications in secure communication and digital signatures.

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DISTANCE EDUCATION

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

Fourth Semester

WEB TECHNOLOGY

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What are the key components of Java Script?

2. Differentiate between Document Type Definition (DTD) ad XML schemas.

3. How does Bean Info Interface enable customization of Java Beans?

4. What is a Document Object Model (DOM)?

5. Explain the use of cookies for session tracking.

6. How do Servlets handle HTTP requests and responses?

7. Explain the concept of error handling and debugging.

8. What are the implicit JSP objects?

9. Provide an introduction to the struts framework.

10. How Java Beans can be deployed in a JSP page?

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Write a JavaScript function that validates a user's input in a form.

Or

(b) Create an XML document that represents a simple data structures.

12. (a) Create a custom Java Bean that generates a random number between a specified range.

Or

(b) Compare the usage of Java Beans in desktop applications with their usage in enterprise-level web applications.

13. (a) Discuss the significance of the init( ) and destroy( ) methods in a Servlet's execution.

Or

(b) Compare and contrast servlets with JavaServer Pages (JSP).

14. (a) Explain the role of the model-view-controller (MVC) pattern in JSP-based applications.

Or

(b) Explain the purpose of JSP tags.

15. (a) Compare the struts framework with other Java web frameworks like Spring and JavaServer faces (JSF).

Or

(b) Explain about database programming using JDBC.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Discuss the role of cascading style sheets (CSS) in modern web development.

17. Elaborate on the steps involved in creating a custom Java Bean.

18. Explain the lifecycle of a servlet, from its initialization to its destruction and discuss how it handles HTTP request and responses.

19. Illustrate the steps in designing a dynamic web application using Java server Pages (JSP) and Servlets.

20. Explain about creating a Java web application that utilizes the struts framework.

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DISTANCE EDUCATION

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

Fourth Semester

SOFTWARE ENGINEERING

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What are process patterns?

2. Define waterfall model.

3. Describe scenario-based modeling.

4. What is an analysis model in requirement engineering?

5. Describe interface analysis.

6. What are the golden rules of user interface design?

7. Explain software reliability.

8. What are software metrics?

9. Explain formal technical reviews.

10. What do you meant by ISO 9000 quality standards?

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Compare and contrast and waterfall model, incremental process models and evolutionary process models.

Or

(b) Describe the process patterns used in software engineering and their application.

12. (a) Discuss the importance of data modeling concepts and object-oriented analysis in building the analysis model.

Or

(b) Explain the steps involved in creating a behavioral model.

13. (a) Compare and contrast different architectural styles and patterns used in software development.

Or

(b) Describe the user interface design process.

14. (a) Discuss the art of debugging and its significance in the software testing phase.

Or

(b) Describe the importance of software metrics for measuring software quality.

15. (a) Discuss the risk refinement and risk mitigation strategies.

Or

(b) What is software quality assurance? Explain.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the layered technology and process framework in software engineering.

17. Describe the requirement engineering process and its importance in software development.

18. Discuss the concept of design engineering and its role in software development.

19. Explain the different testing strategies used in software engineering.

20. Describe the risk management strategies.

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DISTANCE EDUCATION

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

Fourth Semester

CLOUD COMPUTING

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. What are the benefits of cloud computing for non-users?

2. List the types of Cloud Service Development.

3. List types of cloud service development.

4. How can cloud computing be utilized for collaborating on schedules?

5. What is cloud services?

6. What are the issues in cloud?

7. Discuss the privacy concerns related to cloud computing.

8. Define software as a security service (SaaS).

9. What is service level agreements (SLAs) in cloud computing?

10. Describe the use of OpenNebula.

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Describe the historical development of cloud computing and its significance in the IT industry.

Or

(b) Discuss the advantages and disadvantages of developing cloud services and applications.

12. (a) Explain how cloud computing facilitates centralized email communications for better collaboration.

Or

(b) How does cloud computing enhance communication and collaboration in community based projects?

13. (a) Analyze the impact of cloud computing on contact management and project collaboration.

Or

(b) Explain the role of online planning and task management tools in enhancing team collaboration.

14. (a) Investigate the security concerns related to cloud computing and the measures to address them.

Or

(b) Explain federation in cloud computing and its potential impact on interoperability.

15. (a) Describe about open-source cloud deployment platform 'Eucalyptus'.

Or

(b) Explain about open-source cloud deployment platform 'Nimbus'.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Compare and contrast the working principles of cloud computing with traditional computing models.

17. Explain the importance of collaboration in household budget management through cloud-based tools.

18. Discuss the advantages and disadvantages of using cloud-based project management platforms.

19. Assess the security challenges and measures required to safeguard sensitive data in the cloud.

20. Explain the key components and functionalities of OpenNabula for cloud infrastructure management.

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