

SN	QUESTIONS											
01.	<p>What are the three primary goals of computer security?</p> <p>a) Confidentiality, Integrity, Authentication b) Confidentiality, Integrity, Availability c) Confidentiality, Authentication, Authorization d) Integrity, Authentication, Authorization</p>											
02.	<p>A virus typically goes through four phases. Which of the following is NOT one of them?</p> <p>a) Dormant phase b) Propagation phase c) Execution phase d) Duplication phase</p>											
03.	<p>What does "integrity" in computer security imply?</p> <p>a) Data is encrypted to prevent access b) Data is available to unauthorized users c) Data is modified only by authorized users d) Data is deleted after usage</p>											
04.	<p>What is the function of "traffic analysis" in a cyberattack?</p> <p>a) Monitoring data for patterns of unauthorized access b) Encrypting communication channels c) Stealing files using physical storage devices d) Repairing data after an attack</p>											
05.	<p>Which type of attack involves sending repeated requests to overwhelm a system?</p> <p>a) SQL Injection b) Trojan Horse c) Denial-of-Service d) Eavesdropping</p>											
06.	<p>Match each statement about symmetric and asymmetric cryptosystems (Column A) with the correct description (Column B) to identify the differences between them.</p> <table border="1" data-bbox="266 1507 774 1769"> <thead> <tr> <th data-bbox="266 1507 504 1540">Column A (Statements)</th><th data-bbox="504 1507 774 1540">Column B (Descriptions)</th></tr> </thead> <tbody> <tr> <td data-bbox="266 1540 504 1585">1. Symmetric cryptosystems use a "symmetric key".</td><td data-bbox="504 1540 774 1585">a) Involves two different keys: one for encryption (public) and one for Decryption (private).</td></tr> <tr> <td data-bbox="266 1585 504 1630">2. Asymmetric cryptosystems require an "asymmetric key".</td><td data-bbox="504 1585 774 1630">b) Generally exhibits faster encryption and decryption speeds.</td></tr> <tr> <td data-bbox="266 1630 504 1675">3. Symmetric cryptosystems</td><td data-bbox="504 1630 774 1675">c) Uses the same secret key for both encrypting and decrypting data.</td></tr> <tr> <td data-bbox="266 1675 504 1720">4. Asymmetric cryptosystems</td><td data-bbox="504 1675 774 1720">d) Often slower in terms of encryption and decryption.</td></tr> </tbody> </table>	Column A (Statements)	Column B (Descriptions)	1. Symmetric cryptosystems use a "symmetric key".	a) Involves two different keys: one for encryption (public) and one for Decryption (private).	2. Asymmetric cryptosystems require an "asymmetric key".	b) Generally exhibits faster encryption and decryption speeds.	3. Symmetric cryptosystems	c) Uses the same secret key for both encrypting and decrypting data.	4. Asymmetric cryptosystems	d) Often slower in terms of encryption and decryption.	
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4. Asymmetric cryptosystems	d) Often slower in terms of encryption and decryption.											
07.	Analyze the role of encryption in ensuring confidentiality. Provide an example.											
08.	Evaluate the effectiveness of firewalls compared to antivirus software in securing networks. / 10 marks											

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09.	Propose a plan to mitigate the effects of a Denial-of-Service (DoS) attack.
10.	Which of these is a primary component of LAN architecture? a) Printer b) NIC (Network Interface Card) c) Monitor d) Keyboard
11.	What is the main role of the Physical layer in LAN architecture? a) Managing logical data b) Transmitting and receiving bits c) Controlling media access d) Handling error detection
12.	Determine whether each statement regarding the importance of the MAC protocol in LANs is True or False. a. The MAC protocol in a LAN is primarily responsible for ensuring that only one device transmits data at a time to prevent collisions. b. The MAC protocol plays a crucial role in managing the physical layer of the OSI model by controlling how devices access the shared network medium. c. The main function of the MAC protocol is to assign IP addresses to network devices within a LAN.
13.	Match the network characteristics in Column A with their corresponding definitions in Column B . Column A Column B 1. Range a) The maximum distance over which a wireless signal can be reliably transmitted. 2. Bandwidth b) The amount of data that can be transmitted per unit of time over a wireless connection.
14.	Write the steps to configure a default gateway on a wireless router.
15.	Demonstrate how to connect a device to a hidden SSID wireless network.
16.	Analyze the following facts about the use of 2.4 GHz frequency for Wi-Fi networks and classify each as either advantage or disadvantage. 1. Cheaper Devices 2. Greater Range 3. Lower Bandwidth 4. Prone to Interference from Other Devices 5. Congestion Due to More Connected Devices 6. Universal Compatibility 7. Limited Capacity for High-Speed Applications

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	8. Susceptibility to Security Risks 9. Better Penetration Through Obstacles 10. Lower Power Consumption
17.	Compare wired Ethernet networks with wireless LANs.
18.	Critique the effectiveness of the OSI model for modern networking.
19.	Assess the role of wireless access points in extending network coverage.
20.	Propose a method made of at least five measures to secure a wireless LAN against unauthorized access.
21.	What type of cable is used to connect different devices, such as a computer to a switch? a) Fiber optic cable b) Coaxial cable c) Straight-through cable d) Crossover cable
22.	Which protocol is configured when assigning static IP addresses? a) UDP b) IPv4 c) HTTP d) FTP
23.	Why is a switch preferred over a hub in a peer-to-peer (P2P) network with multiple computers? a) Switches are cheaper and easier to install than hubs. b) Switches broadcast data to all connected devices, ensuring all computers receive information. c) Switches forward data only to the intended recipient. d) Switches require less power to operate than hubs.
24.	What role does the subnet mask play in IP configuration?
25.	The steps for making an Ethernet cable have been listed below in a disordered manner. Rearrange them in the correct order: A. Crimp the connectors using an RJ-crimping tool. B. Strip the cable jacket about 4cm from the end. C. Cut the wires straight and insert them into the RJ-45 connectors. D. Test the cable using a cable tester. E. Untwist and align the wires in the T568A orientation on one end and T568B on the other.
26.	Arrange the following statements to Create a step-by-step process to verify network connectivity between two computers. 1. Type "ping" followed by IP addresses of

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	<p>another computer and press Enter.</p> <p>2. Troubleshoot any "Request timed out" messages by checking cables and configurations.</p> <p>3. Check the response for successful replies.</p> <p>4. Open the Command Prompt on one computer.</p> <p>5. Assign unique IP addresses to both computers.</p>	
27.	Compare static and dynamic IP addressing in terms of usability and management.	
28.	<p>Assess the significance of proper cable management in networking projects by answering by True or False for each of the following statements:</p> <p>1. Reduces the risk of cable damage and disconnections.</p> <p>2. Improves network performance and reliability.</p> <p>3. Reduces troubleshooting and upgrades capability.</p>	
29.	Propose a troubleshooting guide for resolving connectivity issues in a P2P network.	
30.	<p>What does SQL stand for?</p> <p>a) Structured Query Language</p> <p>b) Sequential Query Language</p> <p>c) Simplified Query Language</p> <p>d) Standard Query Language</p>	
31.	<p>Which of the following is a unary operation in relational algebra?</p> <p>a) Union</p> <p>b) Cartesian product</p> <p>c) Projection</p> <p>d) Join</p>	
32.	<p>What symbol is used in relational algebra for selection?</p> <p>a) π</p> <p>b) σ</p> <p>c) \times</p> <p>d) U</p>	
33.	Fill in the blank: In relational algebra, the SELECT operation is used to retrieve rows from a relation that satisfy a given condition, while the PROJECT operation is used to retrieve specific _____ from a relation.	
34.	What are the three main purpose of the PRIMARY KEY constraint?	
35.	<p>Why is the WHERE clause important in SQL queries?</p> <p>a) It is used to specify which columns should be retrieved.</p> <p>b) It filters rows based on a specified condition.</p> <p>c) It sorts the query results in ascending or descending order.</p>	

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	d) It groups rows that have the same values into summary rows.																															
36.	<p>Determine whether the following statements about the conditions for performing a UNION operation are True or False:</p> <ol style="list-style-type: none"> 1. Both relations must have the same number of columns. 2. The data types of corresponding columns in both relations must be compatible. 3. The order of columns in both relations does not matter. 4. A UNION operation always removes duplicate rows unless UNION ALL is used. 5. The attributes in the relations must be conceptually related, even if their names differ. 																															
37.	<p>How does a NATURAL JOIN differ from other types of joins?</p> <ol style="list-style-type: none"> a) It combines all rows from both tables, regardless of matching conditions. b) It explicitly requires join conditions to be specified using ON or USING clauses. c) It automatically matches columns with the same name and eliminates duplicates. d) It only retrieves rows that exist in both tables without considering matching columns. 																															
38.	<p>Correct any mistake in this SQL query to list all employees earning more than 50,000 from a table called Employee.</p> <pre>SELECT WHERE * FROM Employee Salary < 50000;</pre>																															
39.	<p>Write the steps to add a new column 'Department' to an existing table 'Employee'.</p>																															
40.	<p>Given the table "Employees", answer the questions provided below it</p> <table border="1" data-bbox="271 1507 758 1799"> <thead> <tr> <th>EmployeeID</th> <th>Name</th> <th>Department</th> <th>Salary</th> <th>HireDate</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>John Smith</td> <td>HR</td> <td>50000</td> <td>2020-03-01</td> </tr> <tr> <td>2</td> <td>Jane Doe</td> <td>IT</td> <td>70000</td> <td>2018-07-15</td> </tr> <tr> <td>3</td> <td>Sam Brown</td> <td>IT</td> <td>65000</td> <td>2019-06-10</td> </tr> <tr> <td>4</td> <td>Anna White</td> <td>Finance</td> <td>60000</td> <td>2021-01-20</td> </tr> <tr> <td>5</td> <td>Mike Green</td> <td>HR</td> <td>52000</td> <td>2020-08-25</td> </tr> </tbody> </table> <ol style="list-style-type: none"> 1. Write a query to display all employees in the IT department. 2. Find the total salary paid to employees in the HR department. 3. Write a query to display the names of employees hired before 2020. 	EmployeeID	Name	Department	Salary	HireDate	1	John Smith	HR	50000	2020-03-01	2	Jane Doe	IT	70000	2018-07-15	3	Sam Brown	IT	65000	2019-06-10	4	Anna White	Finance	60000	2021-01-20	5	Mike Green	HR	52000	2020-08-25	
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	<p>4. Insert a new employee into the Employees table with the following details:</p> <ul style="list-style-type: none"> o EmployeeID: 6 o Name: Sarah Lee o Department: Marketing o HireDate: 2022-05-10 <p>5. Delete all employees from the Finance department.</p> <p>6. Write a query to display the department names along with the total number of employees in each department.</p> <p>7. Write a query to increase the salary of all employees in the HR department by 10%.</p>																																																																											
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04.	<p>Consider two tables below and create queries to answer each question</p> <p>Table Employees</p> <table border="1"> <thead> <tr> <th>EmpId</th> <th>EmpName</th> <th>EmpAge</th> <th>EmpEmail</th> <th>EmpSalary</th> </tr> </thead> <tbody> <tr><td>1</td><td>Mugenzi</td><td>29</td><td>josiane.m@company.rw</td><td>500000</td></tr> <tr><td>2</td><td>Habineza</td><td>35</td><td>didier.h@company.rw</td><td>700000</td></tr> <tr><td>3</td><td>Uwimana</td><td>28</td><td>alice.u@company.rw</td><td>480000</td></tr> <tr><td>4</td><td>Nahuti</td><td>42</td><td>claude.n@company.rw</td><td>900000</td></tr> <tr><td>5</td><td>Mukamish A</td><td>33</td><td>florence.m@company.rw</td><td>650000</td></tr> <tr><td>6</td><td>Ngabo</td><td>31</td><td>jeanpaul.n@company.rw</td><td>720000</td></tr> <tr><td>7</td><td>Mutabazi</td><td>26</td><td>alphonse.m@company.rw</td><td>540000</td></tr> <tr><td>8</td><td>Akimana</td><td>30</td><td>sarah.a@company.rw</td><td>620000</td></tr> <tr><td>9</td><td>Hakizimana</td><td>34</td><td>celestine.h@company.rw</td><td>660000</td></tr> <tr><td>10</td><td>Angc Uwase</td><td>27</td><td>ange.u@company.rw</td><td>590000</td></tr> <tr><td>11</td><td>Riyenkuru</td><td>40</td><td>eric.r@company.rw</td><td>880000</td></tr> <tr><td>12</td><td>Ndahiro</td><td>23</td><td>marie.n@company.rw</td><td>470000</td></tr> <tr><td>13</td><td>Mukotanyi</td><td>39</td><td>jeanette.m@company.rw</td><td>740000</td></tr> </tbody> </table> <p>Table Project</p> <table border="1"> <thead> <tr> <th>Proj</th> <th>ProjName</th> <th>ProjLocation</th> <th>ProjDuration</th> <th>EmpId</th> </tr> </thead> </table>	EmpId	EmpName	EmpAge	EmpEmail	EmpSalary	1	Mugenzi	29	josiane.m@company.rw	500000	2	Habineza	35	didier.h@company.rw	700000	3	Uwimana	28	alice.u@company.rw	480000	4	Nahuti	42	claude.n@company.rw	900000	5	Mukamish A	33	florence.m@company.rw	650000	6	Ngabo	31	jeanpaul.n@company.rw	720000	7	Mutabazi	26	alphonse.m@company.rw	540000	8	Akimana	30	sarah.a@company.rw	620000	9	Hakizimana	34	celestine.h@company.rw	660000	10	Angc Uwase	27	ange.u@company.rw	590000	11	Riyenkuru	40	eric.r@company.rw	880000	12	Ndahiro	23	marie.n@company.rw	470000	13	Mukotanyi	39	jeanette.m@company.rw	740000	Proj	ProjName	ProjLocation	ProjDuration	EmpId
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	<ol style="list-style-type: none"> 1. Write a query to display all the employee names and their emails from the Employees table. 2. Write a query to find employees whose salary is greater than 600,000 RWF. 3. Find employees whose EmpEmail domain is "company.rw" by using the LIKE operator. 4. Retrieve all employees ordered by their salary in descending order. 5. Find the number of employees who are younger than 30. 6. Write a query to display the employee name, project name, and project location for each employee assigned to a project. 7. Retrieve the employee with the highest salary. 8. Write a query to display the names of employees working on projects located in either Kigali or Nyungwe. 9. Write a query to display the name and salary of employees whose salary is higher than the average salary of all employees. 10. Suppose there was an increase in salary for all employees by 5%. Write an SQL query to update each employee's salary accordingly. 11. Write an insert query to add a project number six named "Rubavu Waterfront" located in Rubavu, with a duration of 15 months and assigned to an employee with EmpId = 6. 12. Assume some employees do not have assigned projects. Write a query to find all employees who are not assigned to any project. 																									
05.	<p>What is the starting index of an array in Visual Basic?</p> <p>a) 1 b) -1 c) 0 d) 2</p>																									
06.	<p>What function is used to display a message box in Visual Basic?</p> <p>a) InputBox b) MessageBox c) MsgBox d) Print</p>																									

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07.	What does the Len function in Visual Basic return? a) The number of spaces in a string b) The length of a string including spaces c) The number of characters excluding spaces d) The ASCII value of a string
08.	What is the significance of the ByVal and ByRef keywords for parameter passing in Visual Basic functions?
09.	How does the Mid function differ from the Left function? a) The Mid function extracts from the beginning, while the Left function extracts from the middle. b) The Mid function starts at a specific position, while the Left function starts at the beginning. c) The Mid function works only with numbers, while the Left function works with text. d) The Mid function and Left function perform the same operation.
10.	Write a program to declare a one-dimensional array and initialize it with five names. Display the names in a list box.
11.	Demonstrate how to use the MsgBox function to confirm deletion of a record.
12.	Write a program to calculate the sum of all elements in a two-dimensional array of 10 elements.
13.	Analyze the advantages and disadvantages of using ByVal in function calls.
14.	Determine whether the following statements about the use of arrays for managing large datasets compared to individual variables are True or False: 1. Arrays allow storing multiple values of the same type under a single name, making data management more efficient. 2. Using individual variables for large datasets is more memory-efficient than using arrays. 3. Arrays enable easier iteration and manipulation of large datasets using loops.
15.	Compare the InputBox and MsgBox functions in terms of functionality.
16.	Assess the effectiveness of general procedures for reducing code duplication.
17.	Design a VB program to read marks of a student in five subjects using an array, compute their average and display

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	grades based on the average. 80 to 100: Grade A 70 to 79: Grade B 60 to 69: Grade C 50 to 59: Grade D Below 50: Grade F
18.	Create a Visual Basic application that uses two functions Sum() and Average() respectively. The Function Sum() will prompt user to enter marks of 15 students, store them in a two-dimensional array and computer their sum. The Function Average() will use the sum computed in previous function to compute the average score and displays both sum and average of the marks entered.
19.	By using a general procedure called Pattern(), Create a Visual Basic application to print the following pattern using nested for loops
20.	Which component connects a Visual Basic project to a physical database? a) Front End b) Database Engine c) User Interface d) Recordset
21.	What is the purpose of a Recordset in Visual Basic? a) To delete data b) To provide logical representation of records c) To store user inputs d) To create visual designs
22.	What is the role of the Front End in a Visual Basic project? a) To manage and store data in a database. b) To handle the logic and functionality of the application. c) To provide the user interface for interacting with the application. d) To optimize the performance of back-end processes.
23.	Determine whether the following statements about the key differences between DAO and ADO in Visual Basic

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	<p>are True or False:</p> <ol style="list-style-type: none"> 1. DAO is optimized for Access, while ADO is for universal database access. 2. ADO performs better than DAO with Access databases. 3. DAO is for desktop apps, while ADO is for web and distributed apps. 4. ADO is more flexible, accessing multiple data sources via OLE DB. 5. DAO supports newer technologies than ADO. 	
24.	Write a code snippet to add a new record to a database using ADO in Visual Basic.	
25.	<p>The steps for connecting a Visual Basic form to a database using ODBC are listed below in a disordered manner. Arrange them in the correct order:</p> <p>A. Right-click the control and set the ConnectionString property to the ODBC source. B. Run the form to interact with the database. C. Bind form controls (e.g., text boxes) to the ADO Data Control. D. Open the Visual Basic project and add an ADO Data Control to the form. E. Set the RecordSource property to a table or query in the database.</p>	
26.	Analyze the advantages and disadvantages of using ADO over DAO.	
27.	<p>Determine whether the following statements about the importance of user interface principles in project success are True or False:</p> <ol style="list-style-type: none"> 1. A well-designed user interface improves user experience and makes the application more intuitive. 2. Focusing on aesthetic design alone is enough for a successful user interface. 3. User interface principles help reduce errors by providing clear instructions and feedback. 4. A responsive and accessible interface is crucial for reaching a wider audience. 5. Ignoring user feedback during interface design can lead to a poor user experience. 	
28.	What does the Process Control Block (PCB) NOT include?	

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	a) Process ID b) CPU registers c) Program counter d) Heap allocation strategy																						
29.	What is the role of the long-term scheduler? a) Assigns CPU to processes b) Loads processes from secondary storage to memory c) Manages swapping of processes d) Handles I/O device allocation																						
30.	Which condition is NOT required for a deadlock? a) Circular wait b) Mutual exclusion c) Preemption d) Hold-and-wait																						
31.	Which statement about kernel-level threads is FALSE? a) They are slower to manage than user-level threads b) They support multiprocessing c) They require a thread library for implementation d) They are managed by the operating system																						
32.	Provide steps to calculate average waiting time for a given set of processes using the FCFS scheduling algorithm. Include a brief example.																						
33.	Compare the advantages and disadvantages of user-level threads versus kernel-level threads.																						
34.	Discuss the role of aging in addressing starvation in priority scheduling. Provide an example.																						
35.	Assess how deadlocks affect process management. Propose strategies to handle deadlocks.																						
36.	<p>Given the following processes with their burst time, arrival time, and priority:</p> <table border="1"> <thead> <tr> <th>Process</th> <th>Arrival Time (ms)</th> <th>Burst Time (ms)</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>0</td> <td>8</td> </tr> <tr> <td>P2</td> <td>1</td> <td>4</td> </tr> <tr> <td>P3</td> <td>2</td> <td>2</td> </tr> <tr> <td>P4</td> <td>3</td> <td>1</td> </tr> <tr> <td>P5</td> <td>4</td> <td>3</td> </tr> <tr> <td>P6</td> <td>5</td> <td>2</td> </tr> </tbody> </table> <p>a) Construct a Gantt chart based on burst times and arrival times for these processes using: 1. Preemptive Shortest Job First (SJF) scheduling. 2. Non-Preemptive Shortest Job First (SJF). b) Calculate the average waiting time for each</p>	Process	Arrival Time (ms)	Burst Time (ms)	P1	0	8	P2	1	4	P3	2	2	P4	3	1	P5	4	3	P6	5	2	
Process	Arrival Time (ms)	Burst Time (ms)																					
P1	0	8																					
P2	1	4																					
P3	2	2																					
P4	3	1																					
P5	4	3																					
P6	5	2																					

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	c) Calculate the average turnaround time for each.
37.	Which of the following is a property of a file? a) Processor type b) File compression rate c) Identifier d) Memory bus width
38.	What is the primary difference between text files and binary files? a) Text files are used for images, binary files for text b) Text files are ASCII/Unicode-based, binary files store custom data c) Binary files are readable, text files are not d) Binary files are prone to corruption, text files are not
39.	How does NTFS ensure security for files and folders? a) By restricting file types b) Through advanced encryption and permissions c) By disabling file sharing d) Using FAT extensions
40.	In Windows, how is a hidden attribute assigned to a file? a) Through command line "chmod" b) By right-clicking and selecting properties c) Using the "ls" command d) By changing the file extension
	Illustrate with examples the hierarchical structure of a file system.
02.	Fill in the blanks to compare and contrast the three file allocation methods: contiguous, linked, and indexed. a) Contiguous allocation stores files in _____ blocks of storage, which can lead to issues like fragmentation but allows fast access speed. b) Linked allocation uses _____ to point to the next block, allowing dynamic file size adjustment, but can suffer from slower

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	<p>access.</p> <p>c) Indexed allocation stores _____ to the blocks in a special index table, providing _____ access but requiring more storage for the index.</p>	
03.	<p>Determine whether the following statements about the importance of proper file space allocation strategies in operating systems are True or False:</p> <ol style="list-style-type: none"> 1. Proper allocation does not significantly affect disk space or fragmentation. 2. Improper allocation can slow down data retrieval and increase resource use. 3. Efficient allocation improves system performance by reducing management overhead. 4. File allocation is only crucial for large systems, not small ones. 5. A good allocation strategy compromises system reliability and recovery. 	
04.	<p>Propose a plan for improving file security in a shared network environment. Give at least Five measures in your plan</p>	
05.	<p>Which of the following is an example of non-volatile memory?</p> <ol style="list-style-type: none"> a) RAM b) Cache memory c) ROM d) Buffer memory 	
06.	<p>Which of the following describes internal fragmentation?</p> <ol style="list-style-type: none"> a) Wastage of memory outside a block b) Wastage of memory inside an allocated block c) Fragmentation due to logical memory allocation d) Memory fragmentation caused by swapping 	
07.	<p>Why is cache memory used between the CPU and main memory?</p> <ol style="list-style-type: none"> a) To reduce access time for frequently used data b) To increase memory size c) To store permanent data d) To improve memory allocation 	
08.	<p>What happens during demand paging?</p> <ol style="list-style-type: none"> a) Entire program is loaded into memory at once b) Only required pages are loaded into memory c) Pages are loaded sequentially d) Pages are permanently stored in secondary storage 	

SN	QUESTIONS
09.	What is the primary role of the MMU in memory management? a) To manage cache memory b) To convert logical addresses to physical addresses c) To allocate memory to processes d) To reduce fragmentation
10.	Given a process of size 3MB and three available partitions of sizes 2MB, 4MB, and 5MB, which partition would you allocate using the best-fit algorithm? Explain.
11.	Explain how compaction can resolve external fragmentation.
12.	Determine whether the following statements about fixed and dynamic partitioning techniques in terms of memory utilization are True or False: 1. Fixed partitioning causes minimal internal fragmentation and ensures efficient memory use. 2. Dynamic partitioning reduces internal fragmentation but can cause external fragmentation. 3. Fixed partitioning is more efficient than dynamic partitioning and avoids fragmentation. 4. Dynamic partitioning requires complex management and can lead to fragmentation. 5. Fixed partitioning can waste memory if process sizes don't fit the fixed partitions
13.	Assess the role of virtual memory in enhancing multitasking.
14.	Propose strategies to minimize both internal and external fragmentation in a memory management system.
15.	Which Java collection allows duplicate elements and maintains insertion order? a) HashSet b) TreeSet c) ArrayList d) LinkedHashSet
16.	What is the main difference between HashSet and LinkedHashSet? a) HashSet allows duplicates; LinkedHashSet does not. b) LinkedHashSet maintains insertion order; HashSet does not. c) HashSet is slower than LinkedHashSet. d) LinkedHashSet uses a TreeMap internally.
17.	Why is ArrayList preferred over arrays in Java? a) Arrays are faster but less flexible than ArrayLists. b) ArrayLists resize dynamically and provide utility methods for manipulation.

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	c) Arrays allow insertion at any position. d) ArrayLists are thread-safe by default.
18.	Which Java Collection is best suited for maintaining a sorted order of elements? a) ArrayList b) HashSet c) TreeSet d) LinkedList
19.	Write a Java code snippet to demonstrate adding and retrieving elements from an ArrayList.
20.	Demonstrate the usage of the poll() and peek() methods in a Java Queue by writing a java program that polls and peeks names of three students namely, John, Jane, and Jake.
21.	Evaluate the pros and cons of using TreeSet over HashSet.
22.	Determine whether the following statements about the PriorityQueue class in Java are True or False: 1. PriorityQueue is thread-safe and automatically synchronized. 2. PriorityQueue does not require a comparator for custom ordering. 3. Elements are ordered by natural ordering or a comparator. 4. PriorityQueue does not allow duplicate elements. 5. PriorityQueue provides constant-time access but linear-time removal.
23.	Design a program to demonstrate the use of HashSet for filtering duplicate elements give a list of elements as (Apple, Banana, Apple, Orange).
24.	What is the primary purpose of Apache Tomcat? a) To manage databases b) To serve Java applications c) To compile Java code d) To design GUIs
25.	What does the status code 404 indicate in an HTTP response? a) Successful request b) Internal server error c) Resource not found d) Unauthorized access
26.	Why is Catalina important in the Tomcat architecture? a) It manages server configurations b) It acts as the servlet container c) It handles HTTP protocols d) It monitors server status
27.	What is the significance of the JSP engine Jasper in Tomcat? a) It parses and compiles Java code b) It handles servlet requests c) It converts JSP files into servlets

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	d) It provides network connections	
28.	Write a code snippet to configure a new user in the Tomcat-users.xml file. Make username: "admin" and password:"admin123"	
29.	The steps for testing a newly installed Tomcat server are listed below in a disordered manner. Arrange them in the correct order: A. Open a web browser. B. Troubleshoot using logs if the page does not load. C. Navigate to http://localhost:8080. D. Start the Tomcat server from the Start menu shortcuts. E. Verify the appearance of the Tomcat homepage..	
30.	Determine whether the following statements about the differences between static and dynamic web pages are True or False: 1. Static pages show fixed content, while dynamic pages update based on user input. 2. Static pages need server-side scripting; dynamic pages do not. 3. Dynamic pages are interactive and can use databases, unlike static pages. 4. Static pages load faster as they don't rely on back-end processes. 5. Dynamic pages are best for rarely changing content.	
31.	Assess the significance of HTTP status codes in debugging web applications.	
32.	Design a dynamic web page using JSP that displays user-submitted data namely name and age.	
33.	What is a pixel in computer graphics? a) A unit of memory b) A point of light on a screen c) The smallest graphical unit on a screen d) A type of graphic software	
34.	Which of these is an example of a raster file format? a) TIFF b) SVG c) EPS d) AI	
35.	Why are vector graphics preferred for scalable images? a) They use less memory. b) They are pixel-based. c) They do not lose quality when resized. d) They are easier to edit.	

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36.	<p>Fill in the blanks to explain the difference between 2D and 3D graphics:</p> <ol style="list-style-type: none"> 1. 2D graphics represent objects using _____ dimensions, typically width and height. 2. 3D graphics represent objects using _____ dimensions, including width, height, and _____. 3. 2D graphics are commonly used in _____ applications, while 3D graphics are used in _____ simulations and modeling. 	
37.	Write a formula to calculate the size of an uncompressed image file.	
38.	Compare the features of TIFF and JPEG file formats.	
39.	<p>Determine whether the following statements about the role of image compression in optimizing web performance are True or False:</p> <ol style="list-style-type: none"> 1. Image compression reduces file size, which improves website load times. 2. Compressing images has no impact on bandwidth usage. 3. Over-compression can degrade image quality, affecting user experience. 4. Proper image compression balances quality and performance. 5. Image compression is irrelevant for modern high-speed internet connections. 	
40.	Propose a workflow for processing and compressing images for web use.	
01	<p>What does multimedia primarily combine?</p> <ol style="list-style-type: none"> a) Text and video b) Text, audio, images, animations, and video c) Audio and video only d) Text and images only 	
02.	<p>What does VFX stand for in multimedia applications?</p> <ol style="list-style-type: none"> a) Video Feature Effects b) Visual Effects c) Variable Frame Exchange d) Virtual Frame Experience 	
03.	<p>Why is multimedia important in education?</p> <p>A. It makes learning more engaging and interactive.</p>	

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	B. It increases the workload for teachers without improving learning outcomes. C. It limits the use of traditional teaching methods. D. It reduces the need for teacher involvement in the classroom.
04.	The steps to create a hyperlink in a PowerPoint presentation are listed below in a disordered manner. Arrange them in the correct order: A. Click "OK" to apply the hyperlink. B. In the dialog box, choose the target (webpage, file, or slide). C. Enter the link or select the file/slide. D. Select the text or image to hyperlink. E. Right-click and choose "Hyperlink" or go to Insert > Hyperlink.
05.	Fill in the blanks to compare the features of AVI and MP4 video formats: 1. AVI offers _____ video quality but results in _____ file sizes compared to MP4. 2. MP4 is more suitable for _____ due to its efficient compression and smaller file sizes. 3. AVI supports fewer _____ features compared to MP4, such as subtitles and metadata. 4. MP4 is widely supported across _____ devices and platforms.
06.	Assess the significance of interactive multimedia in medical training.
07.	Propose a workflow for editing an audio file to remove noise and enhance quality.
08.	What does the fstream class provide in C++? a) Only reading functionality b) Only writing functionality c) Both reading and writing functionalities d) File deletion operations
09.	What is the primary purpose of file handling in C++? a) To display data b) To store data permanently c) To delete temporary files d) To manage memory allocation
10.	Why is the close() function essential in file handling? A. It prevents memory leaks by releasing resources used by the file. B. It automatically deletes the file after use. C. It ensures all data is deleted from the file before closing. D. It prevents other programs from accessing the file permanently.

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11.	Determine whether the following statements about the role of the <code>ios::app</code> mode when opening a file are True or False: <ol style="list-style-type: none"> 1. The <code>ios::app</code> mode opens a file in append mode, meaning data is added to the end of the file. 2. The <code>ios::app</code> mode overwrites the existing content of the file with new data. 3. When a file is opened with <code>ios::app</code>, the file pointer is positioned at the beginning of the file.
12.	Write a program to append data to an existing text file called <code>example</code> in C++.
13.	Compare the functionalities of <code>ifstream</code> and <code>ofstream</code> classes in C++.
14.	Assess the importance of file extensions in determining file types.
15.	Design a program to count the number of words in a text file.