

(6 Pages)

Reg. No. : .....

Code No. : 10337 E      Sub. Code : AACCS 41

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Fourth Semester

Computer Science — Allied

MACHINE LEARNING

(For those who joined in July 2020 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Father of Machine Learning (ML)
  - (a) Geoffrey Chaucer
  - (b) Geoffrey Hill
  - (c) Geoffrey Everest Hinton
  - (d) Charles

2. \_\_\_\_\_ algorithms enable the computers to learn from data, and even improve themselves, without being explicitly programmed.
  - (a) Deep learning
  - (b) Machine learning
  - (c) Artificial intelligence
  - (d) Fortran
3. Machine learning algorithms build a model based on sample data, known as \_\_\_\_\_.
  - (a) Training data      (b) Transfer data
  - (c) Data training      (d) Fact data
4. What characterize unlabeled examples in machine learning?
  - (a) there is no prior knowledge
  - (b) there is no confusing knowledge
  - (c) there is prior knowledge
  - (d) there is plenty of confusing knowledge
5. The problem of finding hidden structure in unlabeled data is called \_\_\_\_\_.
  - (a) supervised learning
  - (b) unsupervised learning
  - (c) reinforcement learning
  - (d) e-learning



6. Supervised learning and unsupervised clustering both require which is correct according to the statement
- (a) output attribute      (b) hidden attribute  
(c) input attribute      (d) categorical attribute
7. Which of the following methods do we use to find the best fit line for data in Linear Regression?
- (a) Least square error      (b) Maximum likelihood  
(c) Logarithmic loss      (d) Zero square error
8. Common classes of problems in machine learning is \_\_\_\_\_
- (a) clustering      (b) regression  
(c) classification      (d) all of the above
9. Which of the following is a disadvantage of decision trees?
- (a) Decision trees are prone to be overfit  
(b) Decision trees are robust to outliers  
(c) Factor analysis  
(d) Business analysis

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10. If machine learning model output involves target variable then that model is called as \_\_\_\_\_
- (a) descriptive model  
(b) predictive model  
(c) reinforcement learning  
(d) impeditive model

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) What are the advantage of artificial intelligence? Explain.
- Or
- (b) Describe the main functions of machine learning.
12. (a) Explain the supervised learning algorithms with example.
- Or
- (b) What is difference between linear regression and logistic regression? Explain.
13. (a) How is SVM related to KNN?
- Or
- (b) Summarize the main concept of K-Nearest Neighbors.

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[P.T.O.]



14. (a) What do you mean by decision trees? Explain.

Or

(b) Elaborate the benefits of Naive Bayes algorithms in machine learning.

15. (a) Write about the introduction to K-means algorithm.

Or

(b) Distinguish between the machine learning and data science.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Elaborate the Hands on data visualization with Python Matplotlib.

Or

(b) What is the difference between pandas and DataFrame? Explain.

17. (a) Discuss the methods of gradient descent optimization.

Or

(b) Illustrate the implementation of classification problem in linear regression.

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18. (a) Outline the data normalization used in support vector machines.

Or

(b) Explain the implementation of K-Nearest neighbors.

19. (a) How Naive Bayes algorithms works?

Or

(b) Formulate the implementation of decision tree with example.

20. (a) Determine the working of K-means clustering algorithm.

Or

(b) Determine the ethical and moral issues and challenges in machine learning.

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B.Sc. (CBCS) DEGREE EXAMINATION,  
APRIL 2023

Fifth Semester

Computer Science - Major Elective

CLOUD COMPUTING

(For those who joined in July 2020 only)

Time : Three hours      Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. A \_\_\_\_\_ is a cloud computing service that is both hardware and software.  
(a) service      (b) platform  
(c) model      (d) all of the mentioned
2. Cloud computing doesn't require that \_\_\_\_\_ and software be composable.  
(a) cloud      (b) database  
(c) hardware      (d) all of the mentioned
3. Which of the architectural layer is used as backend in cloud computing?  
(a) client      (b) cloud  
(c) soft      (d) all of the mentioned
4. A \_\_\_\_\_ cloud requires virtualized storage to support the staging and storage of data.  
(a) soft      (b) compute  
(c) local      (d) none of the mentioned
5. \_\_\_\_\_ is a cloud computing service model in which hardware is virtualized in the cloud.  
(a) IaaS      (b) CaaS  
(c) PaaS      (d) None of the mentioned
6. \_\_\_\_\_ serves as a PaaS vendor within Google App Engine system.  
(a) Google      (b) Amazon  
(c) Microsoft      (d) All of the mentioned
7. \_\_\_\_\_ provides virtual machines, virtual storage, virtual infrastructure, and other hardware assets.  
(a) IaaS      (b) SaaS  
(c) PaaS      (d) All of the mentioned

8. Which of the following is a man-in-the-middle type of service?
- (a) CaaS                      (b) IaaS  
(c) AaaS                      (d) All of the mentioned
9. \_\_\_\_\_ as a Service is a hosted application that is the cloud equivalent of a traditional desktop application.
- (a) Software                  (b) Platform  
(c) Analytics                  (d) Compliance
10. \_\_\_\_\_ as a Service is a development environment that builds upon an existing cloud computing application infrastructure.
- (a) Software                  (b) Platform  
(c) Analytics                  (d) Compliance

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Elaborate the characteristics of cloud computing.
- Or
- (b) What are the advantages and disadvantages of cloud computing? Explain.

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12. (a) Describe the challenges of mobile computing
- Or
- (b) Write down the load balancing approach in cloud.
13. (a) Explain the various components of SOA.
- Or
- (b) Mention the objectives of cloud security.
14. (a) Point out the issues of quality of cloud services.
- Or
- (b) Determine the techniques of cloud trust management.
15. (a) Enumerate the cloud computing adoption in India.
- Or
- (b) Summarize the components of Eucalyptus.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 600 words.

16. (a) Discuss the types of cloud development models.
- Or
- (b) Compare the traditional and cloud computing paradigms.

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[P.T.O.]

17. (a) Examine the cloud computing reference architecture.

Or

(b) What are the various types of virtualization? Explain.

18. (a) Illustrate the business management platform as a service.

Or

(b) What are the legal issues in cloud computing? Explain.

19. (a) Draw and explain the cloud disaster recovery architecture.

Or

(b) Evaluate the types of migration for cloud enabled applications.

20. (a) Formulate the different layers of OpenNebula.

Or

(b) Analysis the factors affecting cloud computing adoption.

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Reg. No. : .....

Code No.: 103-44 E

Sub. Code: AECS 61

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Sixth Semester

Computer Science — Major Elective

INTERNET OF THINGS

(For those who joined in July 2020 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. What is IoT?
- (a) Network of physical objects embedded with sensors
  - (b) Network of virtual objects
  - (c) Network of objects in the ring structure
  - (d) Network of sensors

2. Which of the following is not an IoT device?
- (a) Table
  - (b) Laptop
  - (c) Arduino
  - (d) Tablet
3. Which of the following is not an IoT platform?
- (a) Amazon Web Services
  - (b) Microsoft Azure
  - (c) Salesforce
  - (d) Flipkart
4. Which of the following is not an application of IoT?
- (a) BMP280
  - (b) Smart home
  - (c) Smart city
  - (d) Self-driven cars
5. Which of the following is not a fundamental component of an IoT system?
- (a) Sensors
  - (b) Connectivity and data processing
  - (c) User interface
  - (d) Transformer
6. Which of the following is not an actuator in IoT?
- (a) Stepper motor
  - (b) A fan
  - (c) An LED
  - (d) Arduino

7. How many number of elements in the Open IoT Architecture?  
(a) 3 elements (b) 7 elements  
(c) 8 elements (d) 6 elements
8. IoT gateway must provide \_\_\_\_\_  
(a) Protocol abstraction  
(b) Data storage  
(c) Security with hardware  
(d) Simple and fast installation
9. What IoT collects?  
(a) Device data  
(b) Machine generated data  
(c) Sensor data  
(d) Human generated data
10. Which of the following protocol is used to link all the devices in the IoT?  
(a) HTTP (b) UDP  
(c) Network (d) TCP/IP

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Summarize the characteristics of IoT.  
Or  
(b) Explain the publisher subscriber model in communication models.
12. (a) Describe the assembly in programming paradigm.  
Or  
(b) Point out the steps to getting started with Arduino programming.
13. (a) Differentiate between the IoT in homes and healthcare.  
Or  
(b) What are the IoT and constructions? Explain.
14. (a) Elaborate the main concept of smart city.  
Or  
(b) Bring out the concept of IoT and smart energy.



15. (a) Write down the network technologies for IoT and M2M.

Or

- (b) Discuss the securities in IETF M2M network technologies.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)  
Each answer should not exceed 600 words.

16. (a) Determine the physical design of IoT.

Or

- (b) Outline the cloud and fog based architecture of IoT.

17. (a) Discuss the x86 architecture for hardware virtualization.

Or

- (b) What are the benefits of virtualization for embedded systems? Explain.

18. (a) Draw and explain the IoT in architecture with diagram.

Or

- (b) Analysis the different types of cloud models.

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19. (a) Formulate the dimensions and components of smart city initiatives.

Or

- (b) Examine the IoT applications in smart cities.

20. (a) Identify the security for IoT and M2M technologies.

Or

- (b) Evaluate the securities in ETSI M2M network technologies.

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Code No. : 10329 E Sub. Code : AMCS 41

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Fourth Semester

Computer Science — Core

DATA STRUCTURES

(For those who joined in July 2020 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. \_\_\_\_\_ is not the component of data structure.  
(a) Operations (b) Storage structures  
(c) Algorithm (d) None
2. A function calls itself is called \_\_\_\_\_.  
(a) procedure (b) recursion  
(c) both (a) and (b) (d) none

8. DES stands for \_\_\_\_\_.  
(a) Depth First Search  
(b) Direct First Search  
(c) Divine First Search  
(d) None
9. \_\_\_\_\_ : time taken to position the read/write heads to the correct cylinder .  
(a) Latency time  
(b) Seek time  
(c) Transmission time  
(d) None
10. Insert a new record into a sorted sequence of  $i$  records in such a way that the resulting sequence of size  $i + 1$  is also ordered, is called \_\_\_\_\_.  
(a) Merge sort  
(b) Quick sort  
(c) Heap sort  
(d) Insertion sort

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3. Inserting an item into the stack when stack is not full is called \_\_\_\_\_ operation.  
(a) Push (b) Pop  
(c) Add data (d) None
4. How to represent in fix notation  $a * b + 5$  into its postfix form?  
(a)  $ab5 + *$  (b)  $+ * ab5$   
(c)  $ab5 * +$  (d)  $ab * 5 +$
5. \_\_\_\_\_ traversal, visit a node, traverse left and continue.  
(a) Inorder (b) Postorder  
(c) Preorder (d) None
6. Heaps are frequently used to implement \_\_\_\_\_.  
(a) AVL Tree (b) Stack  
(c) Priority Queues (d) None
7. A \_\_\_\_\_ of  $G$  is a graph  $G^1$  such that  $V(G^1) \subseteq V(G)$  and  $E(G^1) \subseteq E(G)$ .  
(a) Sub Graph (b) Euler Graph  
(c) Both (a) and (b) (d) None

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PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) What are the steps involved in Binary search?  
Or  
(b) Define the terms Datatype and Abstract Datatype.
12. (a) Give a brief note on Queue.  
Or  
(b) What do you mean by infix and postfix notation?
13. (a) What is Tree? Describe list representation of tree.  
Or  
(b) Write short note on Forest.
14. (a) Define Graph. Explain any one representation of Graph.  
Or  
(b) What is Recursion? Give a brief note on it.

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[P.T.O.]

15. (a) Write a code for Merge Sort.

Or

(b) Give a short note on Hash table.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) How do you judge a program? Explain space and time complexity in detail.

Or

(b) Define the term array. How do you represent multidimensional array? How it differs from one dimensional array?

17. (a) What is stack? What are the functions involved in stack?

Or

(b) How to implement Doubly linked list?

18. (a) What is Binary tree? List out and explain the properties of Binary tree.

Or

(b) What is binary tree traversal? Explain preorder and post order traversal in detail.

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19. (a) Define minimum cost spanning tree. What is the use of Prim's algorithm?

Or

(b) Explain all pairs shortest paths in detail.

20. (a) What is sorting? Explain Quick Sort in detail.

Or

(b) List out and explain the different types of Hash function available in Data structure.

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B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

Fourth Semester

Computer Science – Core

DATA STRUCTURES

(For those who joined in July 2020 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. A \_\_\_\_\_ is a finite set of instructions.  
(a) Profile (b) Algorithm  
(c) Code (d) Data Structure
2. Queues are known as \_\_\_\_\_ lists.  
(a) FIFO (b) LIFO  
(c) TOP (d) BOTTOM.

3. Deletion in queue take place at one end called \_\_\_\_\_  
(a) Start. (b) Front.  
(c) Rear. (d) Mid.
4. A node in a doubly linked list was at least \_\_\_\_\_ fields.  
(a) 3 (b) 2  
(c) 4 (d) 5
5. The number of sub trees of a node is called its \_\_\_\_\_  
(a) Degree (b) Forest  
(c) Level (d) Terminal
6. A \_\_\_\_\_ is a set of domains.  
(a) Profile (b) Algorithm  
(c) Code (d) Data Structure
7. A \_\_\_\_\_ is an ordered list in which all insertions and deletions are made at one end called top.  
(a) Queue (b) Trees  
(c) Graphs (d) Stack

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8. The items are stored in a memory locations by means of pointer is called \_\_\_\_\_  
(a) Tree (b) Stack  
(c) Linked list (d) Graph
9. The number of nodes in a full binary tree of depth four is \_\_\_\_\_  
(a) 15 (b) 16  
(c) 14 (d) 12
10. A \_\_\_\_\_ is a collection of records, each record having one or more fields.  
(a) File (b) Tree  
(c) Data Item (d) Structure

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Define:  
(i) Data Structure  
(ii) Algorithm.  
Or  
(b) What are different types of asymptotic notation? Give example.

12. (a) What is a queue? Explain the various operations performed on a queue.  
Or  
(b) Elaborate the applications of stack.
13. (a) What are the advantages and disadvantages of representation a binary tree?  
Or  
(b) Describe the transforming a forest into a binary search tree.
14. (a) Write down the graph abstract data type.  
Or  
(b) Mention the purpose of depth first search.
15. (a) Write a note on external sorts.  
Or  
(b) Which data structure is used in hash tables? Explain.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Draw and explain the Abstract Data Type model.

Or

- (b) Discuss the representation of multidimensional arrays.

17. (a) What is a stack? What are the operations to manipulate a stack?

Or

- (b) Write down the evaluating postfix expressions with example.

18. (a) What is a binary search tree? Describe the insertion operation in binary search tree.

Or

- (b) Explain the algorithm for postorder traversal of a binary tree.

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19. (a) Outline the minimum cost spanning trees using prim's algorithm.

Or

- (b) Evaluate the single source all destination path algorithm.

20. (a) Write an algorithm for quick sort and explain it.

Or

- (b) Illustrate the concept of recursive merge sort with example.

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B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

Fourth Semester

Computer Science – Core

COMPUTER ARCHITECTURE

(For those who joined in July 2020 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The decoded instruction is stored in \_\_\_\_\_.
- (a) IR
- (b) PC
- (c) Registers
- (d) MDR

2. A source program is usually in \_\_\_\_\_.
- (a) Assembly language
- (b) Machine level language
- (c) High-level language
- (d) Natural language
3. The ALU makes use of \_\_\_\_\_ to store the intermediate results.
- (a) Accumulators
- (b) Registers
- (c) Heap
- (d) Stack
4. The addressing mode which makes use of in-direction pointers is \_\_\_\_\_.
- (a) Indirect addressing mode
- (b) Index addressing mode
- (c) Relative addressing mode
- (d) Offset addressing mode
5. Booth's Algorithm is applied on \_\_\_\_\_.
- (a) decimal numbers
- (b) binary numbers
- (c) hexadecimal numbers
- (d) octal numbers

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6. Subtraction in computers is carried out by
- (a) 1's complement
- (b) 2's complement
- (c) 3's complement
- (d) 9's complement
7. Which of the following memory unit communicates directly with the CPU?
- (a) Auxiliary memory
- (b) Main memory
- (c) Secondary memory
- (d) None of the above
8. Interrupts initiated by an instruction is called as \_\_\_\_\_.
- (a) Internal                      (b) External
- (c) Hardware                      (d) Software
9. \_\_\_\_\_ method is used to map logical addresses of Variable length onto physical memory.
- (a) Paging
- (b) Overlays
- (c) Segmentation
- (d) Paging with segmentation

10. The DMA controller has \_\_\_\_\_ registers.
- (a) 4                                      (b) 2
- (c) 3                                      (d) 1

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Explain the phases involved in Instruction cycle with the help of necessary timing diagrams?
- Or
- (b) Describe the Common Bus system.
12. (a) Illustrate the Basic computer instruction formats with a neat sketch.
- Or
- (b) Write about control word.
13. (a) (i) Add 11011 and 10101
- (ii) Add 1111 and 0101.
- Or
- (b) Write note on floating point arithmetic with example.

14. (a) Sketch and express about DMA.  
Or  
(b) How Parallel Priority Interrupt works? Describe.

15. (a) Discuss the Memory Hierarchy in computer system.  
Or  
(b) How Cache memory works? Explain.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Express in detail about computer registers.  
Or  
(b) Sketch and explain about control unit of basic computer.
17. (a) Draw and explain General register organization.  
Or  
(b) Illustrate addressing modes.
18. (a) Write and explain the flowchart for division.  
Or  
(b) Explain in detail about booth multiplication algorithm with an example?

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19. (a) Draw the block diagram for I/O Bus and interface modules.

Or

- (b) How data transfer from IO device to CPU takes place in a computer?

20. (a) Explain about main memory and its types.

Or

- (b) Brief out the hardware organization of Associative memory with diagrams.

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RELATIONAL DATABASE MANAGEMENT SYSTEMS

(For those who joined in July 2020 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. \_\_\_\_\_ is lowest level of abstraction describes how the data are actually stored.
  - (a) Logical Level
  - (b) Physical Level
  - (c) View Level
  - (d) Abstracted Level

2. The collection of information stored in the database at a particular moment is called, an \_\_\_\_\_ database
  - (a) Schema
  - (b) Instance
  - (c) Sub Schema
  - (d) Logical Scheme
3. A domain is \_\_\_\_\_ if elements of the domain are considered to be indivisible units.
  - (a) Auto
  - (b) Atomic
  - (c) Static
  - (d) Null
4. A query language is a language in which a user requests information from the \_\_\_\_\_.
  - (a) File
  - (b) Folder
  - (c) Database
  - (d) System
5. The \_\_\_\_\_ constraint on an attribute specifies that the null value is not allowed for that attribute.
  - (a) Domain
  - (b) Null
  - (c) Not Null
  - (d) Check
6. The \_\_\_\_\_ command to load data into the relation
  - (a) Update
  - (b) Delete
  - (c) Insert
  - (d) Push

7. By normalizing relations or sets of relations, one minimizes \_\_\_\_\_.
  - (a) Data
  - (b) Fields
  - (c) Redundancy
  - (d) Database
8. Which of the following is not a type of Normal Form?
  - (a) 1NF
  - (b) 2NF
  - (c) 3NF
  - (d) 10NF
9. PL/SQL Variables are by default \_\_\_\_\_.
  - (a) Case Sensitive
  - (b) Upper Case Sensitive
  - (c) Lower Case Sensitive
  - (d) Not Case Sensitive
10. \_\_\_\_\_ are values used in PL/SQL blocks that do not change during execution.
  - (a) Variables
  - (b) Constants
  - (c) Functions
  - (d) Cursor

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b). Each answer should not exceed 250 words.

11. (a) Discuss about Data Redundancy and Inconsistency.
 

Or

 (b) Explain about DDL.
12. (a) Discuss about Keys in Relational Model
 

Or

 (b) Discuss about DDL.
13. (a) List out the Numeric Data types used in SQL.
 

Or

 (b) Compare Union with Intersection.
14. (a) Define Generalization.
 

Or

 (b) What is Multi Valued Dependency? Explain
15. (a) Define PL/SQL.
 

Or

 (b) How to Set the Not Null Constraints while Creating a Table?



PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)  
Each answer should not exceed 600 words.

16. (a) Describe the data models.

Or

(b) Write detail notes on Storage Manger and Query processor.

17. (a) Describe about Key and Its Types.

Or

(b) Draw the Schema Diagram for the Student Database.

18. (a) Explain about the five Aggregate functions with suitable examples.

Or

(b) Write an Essay on SQL Data types and Schemas.

19. (a) Discuss about the Data Dependencien.

Or

(b) Write detail notes Normalizations in DBMS.

20. (a) Discuss about various methods used for the modification of Table.

Or

(b) Compare Stored Procedures with Functions.

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B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

Fifth Semester

Computer Science – Core

RELATIONAL DATABASE MANAGEMENT  
SYSTEMS

(For those who joined in July 2020 only)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. \_\_\_\_\_ leads to higher storage and access cost.
- (a) Data Redundancy (b) Inconsistency  
(c) Data Isolation (d) Atomicity Problem

2. The \_\_\_\_\_ model uses a collection of tables to represent both data and the relationships among those data
- (a) ER (b) Relational  
(c) Object Based (d) Network
3. A set of permitted values, called the \_\_\_\_\_ of that attribute
- (a) Degree (b) Domain  
(c) Value (d) Sets
4. The SQL \_\_\_\_\_ provides the ability to query information from the database and to insert tuples into, delete tuples from, and modify tuples in the database.
- (a) DDL (b) DML  
(c) DCL (d) DTL
5. \_\_\_\_\_ is a fixed-length character string with user-specified length n
- (a) Varcha (b) Char  
(c) Character (d) Real

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6. The \_\_\_\_\_ table command deletes all information about the dropped relation from the database.
- (a) Delete (b) Drop  
(c) Remove (d) Discontinue
7. A table is in 3NF if it is in 2NF and if it has no \_\_\_\_\_
- (a) Functional Dependencies  
(b) Transitive Dependencies  
(c) Trivial Functional Dependency  
(d) Multivalued Dependencies
8. A table is in BCNF if it is in 3NF and if every determinant is a \_\_\_\_\_ key.
- (a) Dependent  
(b) Normal  
(c) Candidate  
(d) Both Normal and Candidate
9. PL/SQL is a \_\_\_\_\_
- (a) Brick Structured Language  
(b) Block Structured Language  
(c) Banner Structured Language  
(d) Build Structured Language

10. A Variable in PL/SQL should not exceed \_\_\_\_\_
- (a) 10 (b) 20  
(c) 30 (d) 40

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Mention the Applications of Databases.
- Or
- (b) Write short note on Data- Manipulation Languages.
12. (a) Differentiate Primary Key with Unique Key.
- Or
- (b) Write short notes on Relational Operation is SQL.
13. (a) Write short notes on Null Values.
- Or
- (b) List out the Set Operations.

14. (a) Write Short notes on EER model.

Or

(b) Discuss about Partial Dependency.

15. (a) How to Set the Primary Key for Table?

Or

(b) Mention the Advantages of PL/SQL Functions.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)  
Each answer should not exceed 600 words.

16. (a) Discuss about Data Abstraction.

Or

(b) Write detail notes on Database Users and DBA.

17. (a) Describe — How to construct a Schema Diagram?

Or

(b) Describe about the SQL Data Definition.

18. (a) Discuss about Aggregate Functions.

Or

(b) Write detail notes on Integrity Constraints.

19. (a) Describe ER Model.

Or

(b) Explain about 1 NF and 2 NF.

20. (a) Write detail notes on PL/SQL.

Or

(b) Discuss about Stored Procedures in PL/SQL.

(6 pages)

Reg. No. : .....

Code No. : 10332 E Sub. Code : AMCS 53

B.Sc. (CBCS) DEGREE EXAMINATION,  
APRIL 2023

Fifth Semester

Computer Science – Core

PHP AND MYSQL

(For those who joined in July 2020 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. PHP was invented by
  - (a) DrekKolkevi
  - (b) RasmusLerdorf
  - (c) WillamMakepiece
  - (d) List Barely
  
6. Which function sets the file filename last-modified and last-accessed times?
  - (a) sets()                      (b) set()
  - (c) touch()                      (d) touched()
7. Which subquery returns a single value?
  - (a) scalar
  - (b) column
  - (c) row
  - (d) table
8. To combine multiple retrievals, we write several SELECT statements and put the keyword between them. What is the keyword?
  - (a) COMBINE
  - (b) CONCAT
  - (c) JOIN
  - (d) UNION
9. Which one of the following method is used to retrieve the number of rows affected by an INSERT, UPDATE, or DELETE query?
  - (a) num\_rows()
  - (b) affected\_rows()
  - (c) changed\_rows()
  - (d) new\_rows()

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2. Which of the following is the correct syntax to write a PHP code?
  - (a) <?php?>                      (b) <php>
  - (c) <? php>                      (d) <? ?>
3. Which of the following function is used to save a cookie in the user's computer?
  - (a) savecookie ()
  - (b) createcookie ()
  - (c) create\_cookie()
  - (d) setcookie()
4. How to define a function in PHP?
  - (a) function {function body}
  - (b) data type functionName(parameters) {function body}
  - (c) functionName(parameters) {function body}
  - (d) function                      functionName(parameters) {function body}
5. The readfile() function reads a file and writes it to the output buffer.
  - (a) writefile
  - (b) readfile ()
  - (c) processfile
  - (d) Both (a) and (b)

Page 2 Code No. : 10332 E

10. Which one of the following statements can be used to select the database?
  - (a) \$mysqli=select\_db('databasename');
  - (b) mysqli=select\_db('databasename');
  - (c) mysqli->select\_db('databasename')
  - (d) \$mysqli->select\_db('databasename');

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) How comments are used in PHP? Give example.

Or

(b) Distinguish between break and continue statements in PHP.
12. (a) How do you create a user defined function in PHP? Explain.

Or

(b) Enumerate the usage of cookies in PHP with an example.

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[P.T.O.]

13. (a) Compare and contrast between fgets() and fgetc().

Or

(b) Give a short note on locking a file.

14. (a) Analyze the datatypes supported by MySQL.

Or

(b) Explain about sorting and filtering data in MySQL.

15. (a) Explain the procedure to validate the input.

Or

(b) Describe the usage of MySQL commands in PHP for processing result set of queries.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Illustrate about features and history of PHP.

Or

(b) Explain about the control statements in PHP with example.

Page 5 Code No. : 10332 E

17. (a) Discuss in detail about PHP sessions.

Or

(b) Outline the steps to create simple application using PHP.

18. (a) Briefly explain the different methods to read contents from file in PHP.

Or

(b) Write a brief note on reading and writing binary files in PHP.

19. (a) How will you create, insert, update and delete tables in MySQL? Explain.

Or

(b) Discuss the following  
(i) Joining tables and  
(ii) Grouping Data.

20. (a) Narrate the database connectivity using PHP and MySQL with example program.

Or

(b) Explain about debugging and diagnostic functions.

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(6 pages)

Reg. No. : .....

Code No. : 10333 E Sub. Code : AMCS 62

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Sixth Semester

Computer Science – Core

SOFTWARE ENGINEERING AND TESTING

(For those who joined in July 2020 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which is the first step in the software development life cycle?
  - (a) Analysis
  - (b) Design
  - (c) Problem/Opportunity Identification
  - (d) Development and Documentation

2. Which of the following is an important factor that can affect the accuracy and efficacy of estimates?
  - (a) Project size
  - (b) Planning process
  - (c) Project complexity
  - (d) Degree of structural uncertainty
3. What describes the data and control to be processed?
  - (a) Planning process
  - (b) Software scope
  - (c) External hardware
  - (d) Project complexity
4. Which one is not a risk management activity?
  - (a) Risk assessment
  - (b) Risk generation
  - (c) Risk control
  - (d) None of the mentioned
5. The importance of software design can be summarized in a single word which is:
  - (a) Efficiency
  - (b) Accuracy
  - (c) Quality
  - (d) Complexity
6. In Design phase, which is the primary area of concern?
  - (a) Architecture
  - (b) Data
  - (c) Interface
  - (d) All of the mentioned

Page 2 Code No. : 10333 E

7. A characteristic of a software system that can lead to a system error is known as?
  - (a) Human error or mistake
  - (b) System fault
  - (c) System error
  - (d) System failure
8. Unit testing is done by \_\_\_\_\_
  - (a) Users
  - (b) Developers
  - (c) Customers
  - (d) None of the mentioned
9. Quality planning is the process of developing a quality plan for
  - (a) team
  - (b) project
  - (c) customers
  - (d) project manager
10. The incorrect activity among the following for the configuration management of a software system is
  - (a) Version management
  - (b) System management
  - (c) Change management
  - (d) Internship management

Page 3 Code No. : 10333 E

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Summarize the need of object oriented design.  
Or  
(b) Explain the data structure oriented design.
12. (a) What are the properties that Software Requirements Specification (SRS) should possess? Describe.  
Or  
(b) Write about SPMP document of project planning.
13. (a) Explain the overview of SA/SD methodology.  
Or  
(b) What are the classification of design activities? Explain.
14. (a) Elaborate the characteristics of a good user interface.  
Or  
(b) Write a short note on white-box testing.

Page 4 Code No. : 10333 E

[P.T.O.]

15. (a) What are the shortcomings of ISO 9000 certification? Explain.

Or

(b) Distinguish between the hardware and software reliability.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)  
Each answer should not exceed 600 words.

16. (a) Determine the different phases of the spiral model with neat diagram.

Or

(b) Outline the high level language programming.

17. (a) Discuss the important categories of customer requirements.

Or

(b) What are the need of functional requirements of software? Explain.

18. (a) Draw and explain the concept of structured design.

Or

(b) Discuss the main purpose of unit testing.

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19. (a) Compare the internal and external software documentation.

Or

(b) What are the basic concepts and terminologies of testing? Explain.

20. (a) Formulate the need of software reverse engineering.

Or

(b) What are the characteristics of software evolution? Explain.

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B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

Sixth Semester

Computer Science - Core

SOFTWARE ENGINEERING AND TESTING

(For those who joined in July 2020 only)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

- Software development life cycle model selection is based on \_\_\_\_\_.  
 (a) Requirements  
 (b) Development Team and users  
 (c) Project type and its Risk  
 (d) All

- The most abstract data flow representation of a system is the \_\_\_\_\_.  
 (a) Data Flow Diagram  
 (b) Structured chart  
 (c) Flow chart  
 (d) Context Diagram

- Gunning's fog index is a metric designed to measure the \_\_\_\_\_ of a document.  
 (a) Scalability (b) Reliability  
 (c) Readability (d) All

- A \_\_\_\_\_ is a set of all test that have been designed by a tester to test a given program.  
 (a) Test case (b) Test Script  
 (c) Test Scenario (d) Test Suite

- The process of recovering the design and requirement from analysis of its code is  
 (a) Software Reverse Engineering  
 (b) Transformation  
 (c) Backward Engineering  
 (d) None

- What does SDLC stands for?  
 (a) System Design Life Cycle  
 (b) Software Design Life Cycle  
 (c) Software Development Life Cycle  
 (d) System Development Life Cycle
- Requirements gathering is too popularly known as \_\_\_\_\_.  
 (a) Elicitation (b) Inception  
 (c) Iteration (d) Collection
- A person or a group of person who either directly or indirectly concerned with the software is called \_\_\_\_\_.  
 (a) Client (b) Customer  
 (c) Stake holder (d) Vendor
- A graphical data model that shows the different processing functions and the data interchange among them is \_\_\_\_\_.  
 (a) Data Flow Diagram  
 (b) Flow chart  
 (c) H/O Chart  
 (d) Hierarchical chart

- Control Flow Graph is an example for \_\_\_\_\_.  
 (a) White Box Testing  
 (b) Black Box Testing  
 (c) Integration Testing  
 (d) System Testing

PART B — (3 × 5 = 15 marks)

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

Each answer should not exceed 250 words.

- (a) Explain control flow-based design with example.  
 Or  
 (b) Explain prototype model with a neat diagram.
- (a) Describe project estimation techniques in detail.  
 Or  
 (b) Explain the ways of gathering requirements.
- (a) Describe the stages in software design.  
 Or  
 (b) How will you transform a DFD Model into structure chart?



14. (a) Describe the use of window system in detail.

Or

(b) Distinguish verification and validation.

15. (a) Explain software quality management system in detail.

Or

(b) Discuss about SEI CMM in detail.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Explain incremental development model in detail.

Or

(b) Describe V-model in detail.

17. (a) Explain risk management in detail.

Or

(b) Define SRS. Who are its users? List out its characteristics.

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18. (a) Describe the use of structured charts in detail.

Or

(b) Draw context diagram, level-1 DFD and level-2 DFD for super market prize scheme.

19. (a) Explain the different types of user interfaces.

Or

(b) Describe unit testing in detail.

20. (a) What is ISO 9000 certification? Explain ISO 9000 for software industry.

Or

(b) What is software reverse engineering? Explain the model for reverse engineering.

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(6 pages)

Reg. No. : .....

Code No. : 10334 E Sub. Code : AMCS 63

B.Sc. (CBCS) DEGREE EXAMINATION,  
APRIL 2023

Sixth Semester

Computer Science — Core

COMPUTER GRAPHICS AND VISUALIZATION

(For those who joined in July 2020 only)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Each screen point is referred to as a \_\_\_\_\_  
(a) Pivot (b) Pixel  
(c) Dot (d) Indent
2. Color CRTs in graphics systems are designed as \_\_\_\_\_ monitors.  
(a) RGB (b) CMYK  
(c) HLS (d) None

3. There are \_\_\_\_\_ types of translation in computer graphics.  
(a) Five (b) Three  
(c) Four (d) Two
4. Bitmap is a collection of \_\_\_\_\_ that describes an image.  
(a) Pixels (b) Algorithms  
(c) Bits (d) Colors
5. Which of the following is a primary output device of a graphics system?  
(a) Printer (b) Mouse  
(c) Video Monitor (d) Keyboard
6. Which of the following is defined as the process of elimination of parts of a scene outside a window or a viewpoint.  
(a) Cutting (b) Rotating  
(c) Clipping (d) Editing
7. \_\_\_\_\_ is the process of changing or modifying the size of objects.  
(a) Scaling (b) Shearing  
(c) Rotation (d) Translation

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8. The fastest method for calculating pixel position is \_\_\_\_\_  
(a) DDA Line algorithm  
(b) Mid-point Algorithm  
(c) Parallel Line Algorithm  
(d) None
9. Cohen-Sutherland algorithm divides the region into \_\_\_\_\_ spaces.  
(a) 9 (b) 8  
(c) 7 (d) 6
10. The higher number of pixels gives a \_\_\_\_\_ image.  
(a) Better (b) Worst  
(c) Smaller (d) None

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Explain flat panel displays with neat diagrams.  

Or

(b) Explain DDA line drawing algorithm.

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12. (a) Discuss the different text attributes.  

Or

(b) Explain matrix representation and homogenous coordinates for graphical representation.
13. (a) Describe the viewing pipeline with neat diagram.  

Or

(b) Explain how will you transform window-to-viewpoint coordinate.
14. (a) Discuss 3-D coordinate-Axes rotation with example.  

Or

(b) How reflections and sheers are useful in three-dimensional graphical application? Explain.
15. (a) Explain Depth-Buffer method to defect visible surfaces.  

Or

(b) Describe RGB color model in detail.

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[P.T.O.]

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Explain the classifications for graphics software.

Or

- (b) Describe input devices for graphical applications in detail.

17. (a) Explain the basic two dimensional geometric transformations in detail.

Or

- (b) Explain line attributes of output primitives.

18. (a) Describe Cohen–Sutherland Line Clipping algorithm in detail.

Or

- (b) Explain Clipping operations in detail.

19. (a) Discuss the logical classification of input devices.

Or

- (b) Explain three dimensional display methods in detail.

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20. (a) Describe projection in detail.

Or

- (b) Explain HSV color model in detail.
- 

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(6 pages)

Reg. No. : .....

Code No. : 10335 E Sub. Code : AMCS 64

B.Sc. (CBCS) DEGREE EXAMINATION,  
APRIL 2023.

Sixth Semester

Computer Science – Core

INTRODUCTION TO DIGITAL IMAGE PROCESSING

(For those who joined in July 2020 only)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

1. Among the following image processing a technique which is fast, precise and flexible.  
(a) Optical (b) Digital  
(c) Electronic (d) Photographic
2. Which means the assigning meaning to a recognized object?  
(a) Interpretation (b) Periodic  
(c) Acquisition (d) Segmentation

3. 2D Fourier transform and its inverse are infinitely \_\_\_\_\_.  
(a) aperiodic (b) periodic  
(c) Linear (d) Non linear
4. If  $f(x, y)$  is an image function of two variables, then the first order derivative of a one dimensional function,  $f(x)$  is \_\_\_\_\_.  
(a)  $f(x+1) - f(x)$   
(b)  $f(x) - f(x+1)$   
(c)  $f(x-1) - f(x+1)$   
(d)  $f(x) + f(x-1)$
5. Which is a colour attribute that describes a pure colour?  
(a) Saturation (b) Hue  
(c) Brightness (d) Intensity
6. Human perception of colour closely resembles the \_\_\_\_\_ colour model.  
(a) CMY (b) RGB  
(c) HSI (d) CMYK

(6 pages)

Reg. No. : .....

Code No. : 10339 E Sub. Code : ASCS 41

B.Sc. (CBCS) DEGREE EXAMINATION,  
APRIL 2023

Fourth Semester

Computer Science — Skill Based Subject

MULTIMEDIA APPLICATIONS

(For those who joined in July 2020 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The people who weave multimedia into meaningful tapes are multimedia \_\_\_\_\_  
(a) enduser  
(b) developer  
(c) Both (a) and (b)  
(d) None

2. Woven combination of text, graphic art, sound, animation, video elements is described \_\_\_\_\_  
(a) Multimedia  
(b) System Architecture  
(c) Cloud  
(d) None
3. Still images are generated by the computer in the following ways \_\_\_\_\_  
(a) Bitmaps  
(b) Vector-drawn  
(c) Both (a) and (b)  
(d) None
4. Windows uses device independent \_\_\_\_\_ image file formats.  
(a) PICT (b) Pdf  
(c) Bitmaps (d) None
5. \_\_\_\_\_ is a popular effect in which one image transforms into another.  
(a) Kinematics (b) Morphing  
(c) Both (a) and (b) (d) None

6. SECAM stands for \_\_\_\_\_
- (a) Sequential Color and Memory
  - (b) Search Color and Main Memory
  - (c) Sequential Color Access Memory
  - (d) None
7. A \_\_\_\_\_ movie may require many hours of editing and tweaking before it works in sync with other screen activities.
- (a) Quick Time            (b) MPEG
  - (c) Either (a) or (b)    (d) None
8. What are the elements that can vary in project estimates? \_\_\_\_\_
- (a) Time                    (b) Money
  - (c) People                 (d) All the above
9. Users navigate along the branches of a tree structure that is shaped by the natural logic of the content \_\_\_\_\_
- (a) Linear                 (b) Non linear
  - (c) Composite            (d) Hierarchical

10. \_\_\_\_\_ testing is done by real users who will be actually using the software.
- (a) Beta                    (b) Alpha
  - (c) Both (a) and (b)    (d) None

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) How to use multimedia in Business?
- Or
- (b) What do you mean by Fontographer?
12. (a) How to prepare Digital Audio files?
- Or
- (b) What is vaughan's Law of multimedia minimum?
13. (a) Describe the power of motion.
- Or
- (b) What do you mean by morphing?

14. (a) What are the stages involved in multimedia project?

Or

(b) Expand and give a short note on RFP.

15. (a) How to work with clients in producing multimedia project?

Or

(b) Differentiate Alpha versus Beta Testing.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) How to use Text in multimedia?

Or

(b) What are Hypermedia and Hypertext? Explain it in detail.

17. (a) What is vaughan's Law of multimedia minimums? How to add adding sound to multimedia project?

Or

(b) What is multimedia system sounds? What are the different types of Audio file formats available? Explain.

18. (a) How to make animation that work in proper way? Explain.

Or

(b) Explain video compression and optimizing video files for CD-ROM in detail.

19. (a) What are the different types of multimedia authoring tools available? Explain each one of them.

Or

(b) Write short note on the following in Multimedia project planning.

(i) Multimedia process of making

(ii) Scheduling

20. (a) How to design and build a multimedia project?

Or

(b) How to acquire content? Give a brief note on ownership of content created for project.

(7 Pages)

Reg. No. : .....

Code No. : 10464 E      Sub. Code : CACS 11/  
CASE 11

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

First Semester

Computer Science/Software Engineering — Allied

DISCRETE MATHEMATICS

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. A relation means \_\_\_\_\_ on a set  $S$ .
- (a) dual relation      (b) binary relation  
(c) reflexive relation      (d) symmetric relation

2. If  $R_1$  and  $R_2$  are binary relations from set  $A$  to set  $B$ , then the equality \_\_\_\_\_ holds.
- (a)  $(R^c)^c = R^c$   
(b)  $(A \times B)^c = \Phi$   
(c)  $(R_1 \cup R_2)^c = R_1^c \cup R_2^c$   
(d)  $(R_1 \cup R_2)^c = R_1^c \cap R_2^c$
3. A function  $f(x)$  is defined from  $A$  to  $B$  then  $f^{-1}$  is defined \_\_\_\_\_
- (a) from  $A$  to  $B$   
(b) from  $B$  to  $A$   
(c) depends on the inverse of function  
(d) none of the mentioned
4. If  $f$  is a function defined from  $R$  to  $R$ , is given by  $f(x) = 3x - 5$  then  $f^{-1}(x)$  is given by \_\_\_\_\_
- (a)  $1/(3x - 5)$   
(b)  $(x + 5)/3$   
(c) does not exist since it is not a bijection  
(d) none of the mentioned



5. If a matrix  $A = [A_{11} A_{12} \dots A_{1n} A_{21} A_{2n} \dots A_{n1} A_{n2} \dots A_{nn}]$ , order  $(n \times n)$ ,  $A_{ii} = 1$ ,  $A_{ij} = 0$  for  $i \neq j$ . Then that matrix is known as \_\_\_\_\_
- (a) Identity matrix  
 (b) Null matrix  
 (c) Singular matrix  
 (d) None of the mentioned
6. The inverse of function  $f(x) = x^3 + 2$  is \_\_\_\_\_
- (a)  $f^{-1}(y) = (y - 2)^{1/2}$     (b)  $f^{-1}(y) = (y - 2)^{1/3}$   
 (c)  $f^{-1}(y) = (y)^{1/3}$         (d)  $f^{-1}(y) = (y - 2)$
7. A matrix having many rows and one column is known as \_\_\_\_\_
- (a) row matrix  
 (b) column matrix  
 (c) diagonal matrix  
 (d) none of the mentioned
8. Let  $A$  order  $(a \times b)$  and  $B$  order  $(c \times d)$  be two matrices, then for  $AB$  to exist, correct relation is given by \_\_\_\_\_
- (a)  $a = d$                       (b)  $b = c$   
 (c)  $a = b$                       (d)  $c = d$

9. In a graph if  $e = (u, v)$  means \_\_\_\_\_
- (a)  $u$  is adjacent to  $v$  but  $v$  is not adjacent to  $u$   
 (b)  $e$  begins at  $u$  and ends at  $v$   
 (c)  $u$  is processor and  $v$  is successor  
 (d) both (b) and (c)
10. An undirected graph possesses an Eulerian circuit if and only if it is connected and its vertices are \_\_\_\_\_
- (a) all of even degree    (b) all of odd degree  
 (c) of any degree        (d) even in number

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
 Each answer should not exceed 250 words.

11. (a) If a relation  $R$  is transitive, then prove that its inverse relation  $R^{-1}$  is also transitive.
- Or
- (b) Describe the classification of relations.
12. (a) Is the function  $f(x) = x + 1$  from the set of integers to the set of integers onto?
- Or
- (b) Summarize the advantages of inverse function.

13. (a) Find the disjunction of the propositions  $p$  and  $q$  where  $p$  is the proposition 'Today is Saturday' and  $q$  is the proposition 'It is raining heavily today'.

Or

- (b) Write down the following sentence in symbolic form :

- (i) If Avinash is not in a good mood or he is not busy, then he will go to Kharagpur.  
(ii) If Sayantan knows object oriented programming and oracle, then he will get a job.

14. (a) If  $A$  and  $B$  are symmetric matrices, prove that  $(BAB)$  is also symmetric.

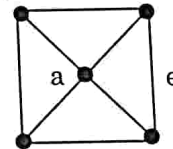
Or

- (b) What are the properties of adjoint of a matrix? Explain.

15. (a) Distinguish between the null graph and complete graph.

Or

- (b) For the graph  $G$ , as shown in figure, draw the sub graphs.



- (i)  $G - e$  (here,  $e$  is one edge)  
(ii)  $G - a$  (here,  $a$  is one vertex).

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 600 words.

16. (a) Let  $Z$  denote the set of integers and the relation  $R$  in  $Z$  be defined by  $aRb$  iff  $a - b$  is an even integer. Then, show that  $R$  is an equivalence relation.

Or

- (b) Let  $A = \{a, b, c\}$  and  $M_R = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 0 \end{bmatrix}$ . Find the

relation  $R$  defined on  $A$ .

17. (a) Let  $f$  and  $g$  be the functions from the set of integers defined by  $f(x) = 2x + 3$  and  $g(x) = 3x + 2$ . Determine the compositions of  $f$  and  $g$  and of  $g$  and  $f$ .

Or

(b) Let  $f: R \rightarrow R$  be defined by  $f(x) = 3x - 4$ . Find a formula for  $f^{-1}$ .

18. (a) Show that  $(p \rightarrow q) \wedge (r \rightarrow q) \Leftrightarrow (p \vee r) \rightarrow q$ .

Or

(b) Show that  $p \Leftrightarrow q$  and  $(p \Rightarrow q)$  are equivalent.

19. (a) Show that the matrix  $A = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$  satisfies the equation  $A^2 - 4A + I = 0$  and hence find  $A^{-1}$ .

Or

(b) If  $A = \begin{bmatrix} 2 & 3 \\ 4 & 8 \end{bmatrix}$  verify that  $A(\text{adj } A) = (\text{adj } A)A = \det(A)I$ .

20. (a) Explain the operations of graph.

Or

(b) Compare the sub graph and isomorphic graph.

(6 Pages)

Reg. No. : .....

Code No. : 10467 E      Sub. Code : CACS 31/  
CASE 31

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Third Semester

Computer Science/Software Engineering — Allied

SCRIPTING LANGUAGES

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. HTML5 should device \_\_\_\_\_  
(a) dependent                      (b) independent  
(c) both (a) and (b)              (d) none
2. Which of the following is not semantic element for text in HTML5? \_\_\_\_\_  
(a) <mark>                              (b) <time>  
(c) <wbr>                                 (d) <article>

3. Which HTML tag is used to declare internal CSS?  
\_\_\_\_\_

(a) <style>                              (b) <link>  
(c) <script>                              (d) none

4. Primary elements of form are \_\_\_\_\_

(a) the point and the line  
(b) the plane  
(c) the volume  
(d) all the above

5. CSS3 provides a gradient colour and schemes like \_\_\_\_\_

(a) RGBA                                 (b) HSLA  
(c) HSL                                      (d) All the above

6. Which of the following is not a HTML5 tag?  
\_\_\_\_\_

(a) <video>                                 (b) <source>  
(c) <track>                                 (d) <slider>



7. Which is the use of the `<noscript>` tag in JavaScript? \_\_\_\_\_
- (a) contents are displayed by non - JS - based browsers
  - (b) clears all cookies and cache
  - (c) both (a) and (b)
  - (d) none
8. Which of the following methods is used to access HTML elements using JavaScript? \_\_\_\_\_
- (a) `getElementById()`
  - (b) `getElementsByClassName()`
  - (c) Both (a) and (b)
  - (d) None
9. JQuery is a \_\_\_\_\_
- (a) JavaScript method
  - (b) JavaScript library
  - (c) JSON library
  - (d) PHP method
10. Which of the following sign is used as a shortcut for JQuery? \_\_\_\_\_
- (a) the % sign
  - (b) the & sign
  - (c) the \$ sign
  - (d) the @ sign

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) How to use hypertext in HTML5?

Or

- (b) How to define a table in HTML5?

12. (a) How do you put elements in a specific place?

Or

- (b) What are the steps involved in adding Text area in HTML5?

13. (a) Write down the three values used in defining colors in HSL method

Or

- (b) Describe the `<audio>` tag properties.

14. (a) Why do you use Javascript?

Or

- (b) Write short note on the document object model.



15. (a) How to use JQuery functions?

Or

(b) Give a brief note on event driven programming.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) How to create dynamic web page? Explain.

Or

(b) Describe the different types of basic elements available in HTML5.

17. (a) How to define and apply rules of CSS3?

Or

(b) Illustrate the steps involved in enhancing HTML5 forms.

18. (a) How to create shadows of elements on the webpage?

Or

(b) How to embed videos in your web page?

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19. (a) Describe in detail about controlling program flow.

Or

(b) How to create and use functions in Javascript?

20. (a) How to change styles dynamically using JQuery?

Or

(b) Explain in detail about focusing in JavaScript and Events.

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(6 Pages)

Reg. No. : .....

Code No. : 10468 E      Sub. Code : CACS 41

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Fourth Semester

Computer Science — Allied

MACHINE LEARNING TECHNIQUES

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Machine learning is an application of \_\_\_\_\_
  - (a) Block chain
  - (b) Artificial intelligence
  - (c) Both (a) and (b)
  - (d) None of these

2. The categories in which machine learning approaches can be traditionally categorized are \_\_\_\_\_
  - (a) Supervised learning
  - (b) Unsupervised learning
  - (c) Reinforcement learning
  - (d) All of the above
3. Logistic regression is a \_\_\_\_\_ regression technique that is used to model data having a binary outcome.
  - (a) Linear
  - (b) Nonlinear
  - (c) Numeric
  - (d) Nonnumeric
4. \_\_\_\_\_ is a disadvantage of decision trees.
  - (a) Decision trees are robust to outlier
  - (b) Decision trees are prone to be overfit
  - (c) Both (a) and (b)
  - (d) None of these
5. Scikit-learn depends on \_\_\_\_\_ and \_\_\_\_\_ python packages.
  - (a) NumPy and SciPy
  - (b) NumPy and StrPy
  - (c) NicPy and SciPy
  - (d) None of these



6. The \_\_\_\_\_ notebook is an interactive environment for running code in the browser.
- (a) Jupyter                      (b) Jnode  
(c) Jsnode                        (d) Kupyter
7. Which is needed by K-means clustering?
- (a) defined distance metric  
(b) number of clusters  
(c) initial guess as to cluster centroids  
(d) all of these
8. Which of the following clustering requires merging approach?
- (a) Partitional  
(b) Hierarchical  
(c) Naive Bayes  
(d) None of the mentioned
9. The subfield of data science/machine learning related to text is called \_\_\_\_\_
- (a) Image processing  
(b) Regression  
(c) Classification  
(d) Natural language processing

10. TF-IDF stands for
- (a) Text Frequency - Inverse Document Frequency  
(b) Term Frequency - Index Document Frequency  
(c) Term Frequency - Inverse Document Frequency  
(d) All of these

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Why Python used in machine learning?
- Or
- (b) What is data exploration in data visualization?
12. (a) Define simple linear regression.
- Or
- (b) What is credit classification? Explain.
13. (a) Discuss about matrix factorization.
- Or
- (b) List the Scikit - Learn library for machine learning.





14. (a) How does Clustering works?

Or

(b) Write K-means algorithm.

15. (a) Explain about sentiment classification.

Or

(b) Discuss about the challenges in text analysis.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Write about framework for developing machine learning models.

Or

(b) What is the advantages of machine learning?

17. (a) What are the steps in building a regression? Explain.

Or

(b) Explain in detail about multiple linear regression.

18. (a) Write and explain Gradient r Algorithm.

Or

(b) Why we need advanced regression model?

19. (a) What are the advantages of hierarchical clustering algorithms?

Or

(b) Illustrate advanced machine learning algorithm.

20. (a) Explain Naive-Bayes model for sentiment classification.

Or

(b) Discuss text analysis with Tf-IDF vectorization.



(6 pages)

Reg. No. : .....

Code No.: 10460 E      Sub. Code: CMCS 11/  
CMSE 11

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

First Semester

Computer Science/ Software Engineering

PROGRAMMING IN C

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which of the following denotes the smallest individual units of a C program?  
(a) Expressions      (b) Tokens  
(c) Arrays      (d) Structures
2. Which of the following is an unary operator?  
(a) ++      (b) +  
(c) &&      (d) ?:

3. Which of the following is equivalent to  $!(x \& \& y \ || \ !z)$   
(a)  $!x \& \& !y \ || \ z$       (b)  $!x \& \& y \ || \ !z$   
(c)  $!x \ || \ !y \& \& z$       (d)  $!x \ || \ !y \ || \ z$
4. What does goto require in order to identify the place where the branch is to be made?  
(a) expression      (b) value  
(c) variable      (d) label
5. Which of the following is a fixed size sequenced collection of elements of the same datatype?  
(a) union      (b) structure  
(c) array      (d) pointer
6. Which of the following terminates its input on the first white space it finds?  
(a) `scanf("%s", s);`      (b) `scanf("%[^\\n]", s);`  
(c) `gets(s);`      (d) `getch(s);`
7. Which of the following is not part of function declaration?  
(a) function name  
(b) function type  
(c) return statement  
(d) terminating semicolon



8. Which of the following is the region of a program in which a variable is available?

- (a) Scope (b) visibility  
(c) lifetime (d) memory

9. Which of the following function sets the position to the beginning of the file?

- (a) moveptr (b) ftell  
(c) rewind (d) setptr

10. What is the value of \*P++ in the following code?

```
int x=10, *p;
```

```
p = &x;
```

- (a) 10 (b) 11  
(c) \*P++ (d) address of x+1

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) What are the different storage classes available in C?

Or

(b) Write notes on getchar() and putchar().

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12. (a) Briefly explain if-else statement with an example.

Or

(b) Compare While and Do statement.

13. (a) How is one-dimensional array declared and initialized?

Or

(b) How are strings declared and initialized?

14. (a) What are the different categories of functions?

Or

(b) Compare structure and union.

15. (a) Write a C program to interchange two numbers using pointers.

Or

(b) Write a note on input/output operations in files.

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[P.T.O.]



PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) What are the different operators available in C? Give their precedence.

Or

- (b) Briefly explain formatted input statement.

17. (a) Explain switch statement with an example.

Or

- (b) Explain FOR statement with an example.

18. (a) Write a C program to sort the given numbers in ascending order.

Or

- (b) Explain any four string handling functions.

19. (a) What is recursion? Explain with an example.

Or

- (b) Explain the scope, visibility and lifetime of a variable.

20. (a) Briefly explain how pointer variables are declared, accessed and used in expressions?

Or

- (b) Explain Error handling during I/O operations.

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B.Sc. (CBCS) DEGREE EXAMINATION,  
APRIL 2023.

Third Semester

Computer Science – Core

JAVA PROGRAMMING

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL the questions.

Choose the correct answer :

1. Which is the object created with new keyword?  
(a) At run time  
(b) At compile time  
(c) Depends on the code  
(d) None
  
7. The applet method \_\_\_\_\_ is used to destroy the applet.  
(a) end() (b) destroy()  
(c) stop() (d) kill()
8. Which of these functions is called to display the output of an applet?  
(a) paint() (b) display applet()  
(c) print applet() (d) display()
9. Which class provides many methods for graphics programming?  
(a) java.awt  
(b) java.awt.graphics  
(c) java.graphics  
(d) none
10. Which of these packages contains all the event handling interfaces?  
(a) java.lang  
(b) java.awt  
(c) java.awt.event  
(d) none

2. Which of the following are Access specifiers?  
(a) Private (b) Public  
(c) Protected (d) All the above
3. Identify the return type of a method that does not return any value \_\_\_\_\_.  
(a) int (b) void  
(c) double (d) none
4. Identify the interface which is used to declare core method in Java?  
(a) Comparator (b) Event listener  
(c) Set (d) Collection
5. Which exception is thrown when java is out of memory?  
(a) Memory error  
(b) Out of memory error  
(c) Memory out of bounds exception  
(d) Memory full exception
6. Thread priority in Java is \_\_\_\_\_.  
(a) Integer (b) Float  
(c) Double (d) Long

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) How to use final keyword?  
Or  
(b) Write short note on Nesting of Methods.
12. (a) Define array. How to create one dimensional array?  
Or  
(b) Give a brief note on strings.
13. (a) What do you mean by thread priority?  
Or  
(b) What is the use of 'finally' statement?
14. (a) How does Applet differ from applications?  
Or  
(b) How to prepare applet?
15. (a) What is Event handling?  
Or  
(b) How to draw lines?

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Write a simple java code to implement class and object.

Or

- (b) Explain overriding methods with an example program.

17. (a) Define Interface. Give a brief note on extending interface.

Or

- (b) How to create and access a package in Java?

18. (a) With neat diagram, explain the life cycle of thread.

Or

- (b) What is exception handling? How to handle it in Java?

19. (a) How to create executable applet? Explain.

Or

- (b) What is Applet tag? Write an Applet code to pass parameters to Applet.

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20. (a) What do you mean by Graphics Class? How to draw Arcs and Polygons?

Or

- (b) How to get Input from user? Give a brief note on AWT packages.
- 

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B.A. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023

Third Semester

English — Core

BRITISH PROSE

(For those who joined in July 2021-2022)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- According to Arnold, \_\_\_\_\_ is incomplete without poetry.  
(a) Man (b) Nature  
(c) Science (d) Life
- Mr. Tibbs was a \_\_\_\_\_ man.  
(a) rich (b) wealthy  
(c) prosperous (d) poor

- What does the 'bee' symbolize in "The battle of the Books"?  
(a) ancients (b) moderns  
(c) post-moderns (d) ultra-moderns
- According to \_\_\_\_\_ women are more superior than men.  
(a) Arnold (b) Ruskin  
(c) Bacon (d) Dryden
- Sir Roger is a \_\_\_\_\_ person.  
(a) cruel (b) cunning  
(c) bad (d) kind
- A juggler amuses the audience with his \_\_\_\_\_ tricks.  
(a) serious (b) funny  
(c) cunning (d) cautious
- According to E.M. Foster \_\_\_\_\_ allows criticism.  
(a) authority (b) power  
(c) democracy (d) force

Page 2

Code No. : 10569

- Eric Arthur Blair is known by his pen name \_\_\_\_\_.  
(a) Arnold (b) Addison  
(c) Hazlitt (d) George Orwell
- According to Viscount Grey, \_\_\_\_\_ provide a lasting pleasure.  
(a) friends (b) relations  
(c) books (d) neighbours
- Who discovered the existence of Pere David Deer?  
(a) Father Anthony (b) Father David  
(c) Father Jones (d) Father William

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

- (a) Mention the three ways of estimation proposed by Arnold.  
Or  
(b) Comment on Bacon's Style of writing.

- (a) "Lamb expresses his love for the roasted pig in "A Dissertation Up on the Roast Pig" - Analyse it.  
Or  
(b) Examine Ruskin's views on the role of the women in the society and politics.
- (a) Sketch the character of Sir Roger De Coverley.  
Or  
(b) Discuss Ramo Samee san active Indian juggler and magician.
- (a) Describe the reason why does Orwell dislike the Bookseller's profession.  
Or  
(b) Examine E.M. Foster's argument about the importance of Personal relationships and the state in "What I Believe".
- (a) Explore the concept of liberty by J.S. Mill in his "On the Equality of Sexes".  
Or  
(b) Elaborate on the survival of Pere David Deer in England.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Bring out the sarcasm in Goldsmith's "Beau Tibbs, His character and Family".

Or

- (b) Consider Bacon as the Father of English Essayist.

17. (a) Analyse critically Charles Lamb's "A Dissertation Upon the Roast Pig".

Or

- (b) Trace the origin of the dispute between the books in "The Battle of the Books".

18. (a) Critically analyse William Hazlitt's "The Indian Jugglers".

Or

- (b) Bring out the importance of 'Sunday' in Addison's "Sir Roger De Coverley's Sunday".

19. (a) Draft an essay on George Orwell's "Bookshop Memories".

Or

- (b) Analyse E.M. Foster's views about democracy in "What I Believe".

20. (a) Draft an essay on Viscount Grey's ideology on reading for pleasure.

Or

- (b) Elaborate on J.S. Mill's fight for the equality of sexes.



PART A — (10 × 1 = 10 marks)

Answer ALL the questions.

Choose the correct answer:

1. When does the Array Index Out Of Bounds Exception occur?
  - (a) Compile-time
  - (b) Run-time
  - (c) Not an error
  - (d) Not an exception at all

7. What is the number of edges present in a complete graph having  $n$  vertices?
  - (a)  $(n * (n + 1)) / 2$
  - (b)  $(n * (n - 1)) / 2$
  - (c)  $n$
  - (d) Information given is insufficient
8. Which of the following statements for a simple graph is correct?
  - (a) Every path is a trail
  - (b) Every trail is a path
  - (c) Every trail is a path as well as every path is a trail
  - (d) Path and trail have no relation
9. Which of the following is not a stable sorting algorithm?
  - (a) Insertion sort
  - (b) Selection sort
  - (c) Bubble sort
  - (d) Merge sort

2. Which data structure is mainly used for implementing the recursive algorithm?
  - (a) Queue
  - (b) Stack
  - (c) Binary tree
  - (d) Linked list
3. Process of inserting an element in stack is called \_\_\_\_\_.
  - (a) Create
  - (b) Push
  - (c) Evaluation
  - (d) Pop
4. Linked list is considered as an example of \_\_\_\_\_ type of memory allocation.
  - (a) Dynamic
  - (b) Static
  - (c) Compile time
  - (d) Heap
5. What is the maximum number of children that a binary tree node can have?
  - (a) 0
  - (b) 1
  - (c) 2
  - (d) 3
6. To obtain a prefix expression, which of the tree traversals is used?
  - (a) Level-order traversal
  - (b) Pre-order traversal
  - (c) Post-order traversal
  - (d) In-order traversal

10. Quick Sort can be categorized into which of the following?
  - (a) Brute Force technique
  - (b) Divide and conquer
  - (c) Greedy algorithm
  - (d) Dynamic programming

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Discuss about Dynamic Memory Allocation.  
Or  
(b) Discuss uses of Arrays and its types.
12. (a) Define Queue.  
Or  
(b) Mention the Advantages of Doubly Linked List.
13. (a) Explain about Max Heap.  
Or  
(b) Mention the Properties of Binary Tree.

14. (a) Discuss about Graph Representation.

Or

(b) Write short notes on Spanning Tree.

15. (a) Write about the Uses of Sorting and Merging.

Or

(b) Write short notes of Satic Hashing.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)  
Each answer should not exceed 600 words.

16. (a) Write notes on Performance Analysis.

Or

(b) State the Algorithm for Matrix Multiplication.

17. (a) Discuss about Linked Stack and its Operations.

Or

(b) Explain about Sparse Matrix and its Representation.

18. (a) Compare Inorder, Preorder, Postorder Traversal.

Or

(b) Explain – how make an insertion into and Deletion from Binary Search Tree.

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19. (a) Compare Depth First Search with Breadth First Search.

Or

(b) Discuss about Prim's Algorithm.

20. (a) Write detail notes on Merge Sorting.

Or

(b) Discuss about Heap Sort.

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(6 pages)

Reg. No. : .....

Code No. : 20484 E Sub. Code : CMCS 41

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

Fourth Semester

Computer Science – Core

DATA STRUCTURES

(For those who joined in July 2021-2022)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer:

1. How can we initialize an array in C language?  
(a) `int arr[2]=(10, 20)`  
(b) `int arr(2)={10, 20}`  
(c) `int arr[2]={10, 20}`  
(d) `int arr(2)=(10, 20)`

6. What is the traversal strategy used in the binary tree?  
(a) depth-first traversal  
(b) breadth-first traversal  
(c) random traversal  
(d) priority traversal
7. A connected planar graph having 6 vertices, 7 edges contains \_\_\_\_\_ regions.  
(a) 15 (b) 3  
(c) 1 (d) 11
8. A graph with all vertices having equal degree is known as a \_\_\_\_\_.  
(a) Multi Graph (b) Regular Graph  
(c) Simple Graph (d) Complete Graph
9. Which of the following is not in place sorting algorithm?  
(a) Selection sort (b) Heap sort  
(c) Quick sort (d) Merge sort

2. Which one of the following is the size of `int arr[9]` assuming that `int` is of 4 bytes?  
(a) 9 (b) 36  
(c) 35 (d) 40
3. Process of removing an element from stack is called \_\_\_\_\_.  
(a) Create (b) Push  
(c) Evaluation (d) Pop
4. What is the worst case time complexity of inserting a node in a doubly linked list?  
(a)  $O(n \log n)$  (b)  $O(\log n)$   
(c)  $O(n)$  (d)  $O(1)$
5. How many children does a binary tree have?  
(a) 2  
(b) any number of children  
(c) 0 or 1 or 2  
(d) 0 or 1

10. What is an internal sorting algorithm?  
(a) Algorithm that uses tape or disk during the sort  
(b) Algorithm that uses main memory during the sort  
(c) Algorithm that involves swapping  
(d) Algorithm that are considered 'in place'

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Write short notes on Pointers.  
Or  
(b) Explain — How Represent a Multidimensional Arrays?
12. (a) Elucidate Stack and its functions.  
Or  
(b) Write short notes on Sparse Matrix
13. (a) Discuss the Terminology of Tree.  
Or  
(b) Write short notes on Forest Traversals.

14. (a) Discuss about Depth First Search.

Or

(b) Explain the Activity on Vertex Networks.

15. (a) Discuss about Insertion Sort.

Or

(b) Write short notes on Hashing.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Describe the various phases in System Life Cycle.

Or

(b) Write an Algorithm for Polynomial Addition.

17. (a) Explain how to add and delete items in a Queue.

Or

(b) Discuss about Doubly Linked List.

18. (a) Write detail notes on Binary Tree Traversals.

Or

(b) Explain the joining and Splitting of a Binary Search Tree.

19. (a) Describe Kruskal's Algorithm.

Or

(b) Write detail notes on Spanning Tree.

20. (a) Discuss about Quick Sort.

Or

(b) Write detail notes on K-way Merging.

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

Fifth Semester

Computer Science – Core

RELATIONAL DATABASE MANAGEMENT SYSTEM

(For those who joined in July 2021-2022)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- The collection of data that contains information relevant to an enterprise is
  - (a) MS ACCESS
  - (b) ORACLE
  - (c) DBMS
  - (d) Database

- Which join preserves tuples in both relations?
  - (a) left outer
  - (b) right outer
  - (c) full outer
  - (d) inner
- If the domains of all attributes of a relation schema R, are atomic, then R is in \_\_\_\_\_
  - (a) 1 NF
  - (b) 2 NF
  - (c) 3 NF
  - (d) BCNF
- Which dependencies generalize multivalued dependencies?
  - (a) referential
  - (b) join
  - (c) functional
  - (d) domain
- Which of the following is not included in Data Manipulation Language?
  - (a) UPDATE
  - (b) CREATE
  - (c) INSERT
  - (d) DELETE
- Which of the following keyword is used with Data Control Language statements?
  - (a) INSERT
  - (b) SELECT
  - (c) GRANT
  - (d) DELETE

- The overall design of the database is called as \_\_\_\_\_
  - (a) Structure
  - (b) Architecture
  - (c) Schema
  - (d) Model
- The relational data model is based on collection of \_\_\_\_\_
  - (a) data
  - (b) relations
  - (c) decisions
  - (d) tables
- Which of the following is based on relational algebra?
  - (a) DML
  - (b) DDL
  - (c) SQL
  - (d) Tuple
- Which operator is used for performing pattern match in strings?
  - (a) equality
  - (b) =
  - (c) equal to
  - (d) like

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

- Write a note on the purpose of database systems.

Or

  - Write a note on data mining.
- Give the structure of relational databases.

Or

  - Give the basic structure of SQL queries.
- Write a note on null values.

Or

  - What are the basic datatypes in SQL?
- How are ER diagrams reduced to schema?

Or

  - Give the features of good relational design.

15. (a) How is a table modified?

Or

(b) Write a PL/SQL function to display fibonacci series: 0, 1, 1, 2, 3, 5 .....

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Briefly describe data abstraction.

Or

(b) Briefly explain transaction management.

17. (a) Briefly explain the relational operations.

Or

(b) Explain SQL data definition.

18. (a) Briefly explain nested sub queries.

Or

(b) Briefly explain inner and outer joins.

19. (a) Explain Entity Relationship model.

Or

(b) Discuss about decomposition using functional dependencies.

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20. (a) Describe with example how a view is created in Oracle.

Or

(b) Write about stored procedures in PL/SQL.

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Reg. No. : \_\_\_\_\_

Code No. : 20486 E Sub. Code : CMCS 52

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

Fifth Semester

Computer Science – Core

DATA COMMUNICATION AND NETWORKS

(For those who joined in July 2021-2022 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. How many layers are there in the OSI model?  
(a) 3 (b) 4  
(c) 5 (d) 7
2. Which layer in the OSI model is responsible for routing and forwarding data packets?  
(a) Physical Layer (b) Data Link Layer  
(c) Network Layer (d) Transport Layer

7. Which technique is used in the Data Link Layer to detect errors in data transmission?  
(a) Encryption (b) Checksum  
(c) Modulation (d) Compression
8. In the context of Wired LANs, what does IEEE stand for?  
(a) International Electronic and Electrical Engineers  
(b) Institute of Electrical and Electronic Engineers  
(c) International Energy Efficiency Experts  
(d) Institute of Electrical Efficiency Engineers
9. Which Transport Layer protocol ensures reliable data delivery with error checking and flow control?  
(a) UDP (b) TCP  
(c) IP (d) DNS
10. Which IEEE standard governs Wireless LANs (WLANs)?  
(a) IEEE 802.3 (b) IEEE 802.11  
(c) IEEE 802.16 (d) IEEE 802.1Q

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3. Which of the following is an example of a guided transmission medium?  
(a) Twisted-pair cable  
(b) Satellite communication  
(c) Wireless LAN  
(d) Infrared communication
4. Which of the following is an example of an unguided transmission medium?  
(a) Coaxial cable  
(b) Fiber-optic cable  
(c) Infrared communication  
(d) Twisted-pair cable
5. Which technology uses the traditional telephone network to establish a connection between a computer and the Internet?  
(a) Cable TV Network  
(b) Digital Subscriber Line (DSL)  
(c) Dial-Up Modem  
(d) Virtual Circuit Network
6. In a Datagram Network, data is transmitted in the form of  
(a) Packets (b) Circuits  
(c) Frames (d) Segments

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PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Explain the different modes of data communication.  
Or  
(b) Classify the various topologies in Data Communication Network.
12. (a) Why guided media used for transmission? Discuss.  
Or  
(b) Distinguish between data rate and signal rate.
13. (a) What is the purpose of Dial-Up Modem? Discuss.  
Or  
(b) Explain datagram and its key characteristics.
14. (a) How does error control ensure reliable data delivery? Explain.  
Or  
(b) Differentiate between noiseless channels and noisy channels.

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[P.T.O.]

15. (a) Differentiate between IPv4 and IPv6 addressing schemes.

Or

(b) Write a short note on Domain Name System.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Demonstrate the OSI reference model with neat diagram.

Or

(b) Summarize the concept of protocol and standard in Data Communication Network.

17. (a) Interpret Time Division Multiplexing with an example.

Or

(b) What are the factors affect the network performance? Discuss.

18. (a) Describe the operation of virtual circuit approach.

Or

(b) How has the cable TV network been adapted to support data transfer? Discuss.

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19. (a) Explain the significance of IEEE standards in the context of wired LANs.

Or

(b) Describe the improvement made in the fast Ethernet standard compare to standard Ethernet.

20. (a) Discuss the advantages and challenges using wireless LAN.

Or

(b) Explain about interworking and its importance.

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Code No. : 20487 E Sub. Code : CMCS 53

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

Fifth Semester

Computer Science -- Core

PHP AND MySQL

(For those who joined in July 2021-2022)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Variable names in PHP start with  
(a) ! (b) \$  
(c) & (d) #
2. Which of the following is not a variable scope in PHP?  
(a) Extern (b) Local  
(c) Static (d) Global

3. While loop is \_\_\_\_\_ controlled loop.  
(a) exit (b) exist  
(c) easy (d) entry
4. PHP's numerically indexed array begins with position \_\_\_\_\_.  
(a) 1 (b) -1  
(c) 0 (d) 2
5. fopen () requires \_\_\_\_\_ arguments.  
(a) 0 (b) 1  
(c) 2 (d) 3
6. The length of file can be found using \_\_\_\_\_ function.  
(a) filesize() (b) fcount()  
(c) filesizes() (d) count()
7. The \_\_\_\_\_ data type has an range of 0-255  
(a) signed TINYINT  
(b) Unsigned TINYINT  
(c) SMALLINT  
(d) MEDIUMINT

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8. In which language My SQL is developed?  
(a) Python (b) C/C++  
(c) Java (d) Pascal
9. Which command is used to show table definition in MySQL?  
(a) DESC table name;  
(b) DESC TABLE table name  
(c) DSEC table  
(d) DECS table name
10. Which one of the following methods is responsible for sending query to database?  
(a) query () (b) send mysql-query  
(c) send () (d) mysqli-query ()

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Write about the operators in PHP.  
Or  
(b) Differentiate between while loop and do while loop giving examples.

12. (a) How are arrays created and modified in PHP?  
Or  
(b) Discuss cookies in PHP.
13. (a) Describe fseek () function, its parameters and use.  
Or  
(b) Explain the working of parse-ini-file function.
14. (a) What are the features of My SQL? Discuss.  
Or  
(b) How is advanced data filtering done in My SQL?
15. (a) How do you connect a MySQL table with PHP?  
Or  
(b) Write about error handling in MySQL.

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[P.T.O.]

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Describe looping statements in PHP with sample code.

Or

- (b) Calculate bonus of employees of an organisation using five different conditions in a PHP program.

17. (a) Illustrate usage of external programs in PHP.

Or

- (b) How are arrays used for grouping forms? Give examples.

18. (a) Create an associative array of courses and course teachers. Display the details of all courses using a PHP program.

Or

- (b) Write the operations and functions required for file manipulation.

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19. (a) How are databases and tables created and manipulated in MySQL?

Or

- (b) Write a detailed note on aggregate functions and SET operations in MySQL.

20. (a) Explain database connectivity and processing of result sets with examples.

Or

- (b) Discuss the different ways of formatting output in PHP and MySQL.

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U.G. (CBCS) DEGREE EXAMINATION, APRIL 2023

Third Semester

Computer Science – Non Major Elective

**BASIC PROGRAMMING DESIGN**

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

**PART A — (10 × 1 = 10 marks)**

Answer ALL questions.

Choose the correct answer :

1. To give a set of instructions to a computer is called \_\_\_\_\_  
 (a) Algorithm (b) Flowchart  
 (c) Program (d) None
2. Diagrammatic representation of algorithm is called \_\_\_\_\_  
 (a) program (b) flowchart  
 (c) both (a) and (b) (d) none

8. \_\_\_\_\_ is a type of computer program that is designed to run a computer's hardware and application programs.  
 (a) Application software  
 (b) System software  
 (c) Both (a) and (b)  
 (d) None
9. A \_\_\_\_\_ is a company that provides individuals and organizations access to the internet and other related services.  
 (a) ISP (b) WWW  
 (c) URL (d) None
10. Internet applications : \_\_\_\_\_  
 (a) Email (b) FTP  
 (c) Telnet (d) All the above

**PART B — (5 × 5 = 25 marks)**

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Define algorithm. Write an algorithm for addition of two numbers.  
 Or  
 (b) List out any three advantages and disadvantages of decision table.

3. \_\_\_\_\_ is the process of executing a program with the intent of finding errors.  
 (a) Program testing (b) Documentation  
 (c) Compiling (d) None
4. \_\_\_\_\_ programming is a type of programming that generally executes in sequential order.  
 (a) Structured (b) Unstructured  
 (c) Both (a) and (b) (d) None
5. The components used in third generation of computers \_\_\_\_\_  
 (a) Vacuum tube (b) Capacitor  
 (c) Transistor (d) IC
6. Features of good programming language \_\_\_\_\_  
 (a) Performance (b) Cost  
 (c) Reusability (d) All the above
7. Physical components of a computer \_\_\_\_\_  
 (a) Hardware (b) Software  
 (c) Both (a) and (b) (d) None

12. (a) What is program documentation?  
 Or  
 (b) Give a brief note on structured and unstructured programming.
13. (a) How do you classify the programming language?  
 Or  
 (b) Write short note on any three features of good programming language.
14. (a) Define the terms :  
 (i) fireware  
 (ii) liveware  
 (iii) freeware.  
 Or  
 (b) Define the terms :  
 (i) Public domain software  
 (ii) Commercial software.
15. (a) List out the usage of www and web page.  
 Or  
 (b) How does modem use connected the Internet?

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 600 words.

16. (a) Define computer program. How to develop a computer program?

Or

- (b) Explain flowchart and its importance, symbols, guidelines, structures and limitations in detail.

17. (a) List out and explain the concepts available in object oriented programming.

Or

- (b) Write short note on the following :

(i) Program testing and debugging

(ii) Characteristics of good programming.

18. (a) What are the different generations available in computer? Explain each one of them.

Or

- (b) What is programming language? Explain the evolution of programming language in detail.

19. (a) Define software. Describe the relationship between hardware and software.

Or

- (b) What are the different types of software categories available? Explain each one of them.

20. (a) Discuss in detail the E-mail.

Or

- (b) Describe internet and virus in detail.

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

1. A/An \_\_\_\_\_ tag is used to specify a style sheet used by the document.  
(a) <base> (b) <link>  
(c) <object> (d) <script>
2. URL is \_\_\_\_\_  
(a) web address (b) source code  
(c) user's address (d) an attribute

3. The \_\_\_\_\_ tag defines an image in an HTML page.  
(a) <image> (b) <img>  
(c) <ima> (d) None of these
4. Which one of the following is a type of lists that HTML supports?  
(a) Ordered lists (b) Unordered lists  
(c) Description lists (d) All of the above
5. Each cell of the table can be represented by using \_\_\_\_\_  
(a) <tr> (b) <td>  
(c) <th> (d) <thead>
6. In HTML table row is defined by  
(a) <td> (b) <th>  
(c) <tr> (d) None of the above

7. The correct sequence of HTML tags for starting a webpage is  
(a) Head, Title, HTML, body  
(b) HTML, Body, Title, Head  
(c) HTML, Head, Body, Title  
(d) HTML, Head, Title, Body
8. In a frame tag, the number of Rows are specified in \_\_\_\_\_  
(a) Alphabets (b) Alphanumeric  
(c) Meters (d) Pixels
9. A \_\_\_\_\_ tag is used to enclose document wide style specifications, typically in cascading style sheet(css) format.  
(a) <base> (b) <link>  
(c) <style> (d) <script>
10. Which is the abbreviation for DHTML?  
(a) Dynamic Hypertest Mark up Language  
(b) Dynamic Hyper Text Mark-up Language  
(c) Dynamic Hyper Markup Language  
(d) Dynamic Hyper Tip Mark up Language

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Write about HTML Anchor tag with example.  
Or  
(b) How to design your home page?
12. (a) Discuss the following tag in HTML.  
Aligning  
Or  
(b) Illustrate insert PNG image in web page.
13. (a) Give an example of an unordered list using HTML.  
Or  
(b) Discuss about Cell Spanning in HTML table.
14. (a) What is frame in HTML?  
Or  
(b) Write about nested frames in HTML.

15. (a) What is style in DHTML?

Or

(b) What is Internal style in DHTML?

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Design a web page for your college using HTML.

Or

(b) Explain HTML basic element tags.

17. (a) How to design a colorful Jobseekers web page?

Or

(b) Explain

(i) heading tag

(ii) img tag with example

18. (a) Write about Nested list in HTML.

Or

(b) Discuss about coloring cell in HTML table.

19. (a) Write HTML code for Frame set.

Or

(b) Design a webpage using action attributes.

20. (a) Write about elements of styles in DHTML.

Or

(b) Explain

(i) External style

(ii) Inline style with example code

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(6 pages)

Reg. No. : .....

Code No. : 10469 E

Sub. Code : CSCS 31

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Third Semester

Computer Science – Skill Based Subject

DIGITAL DESIGN

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL the questions.

Choose the correct answer :

1. Convert hexadecimal value 16 to decimal

(a) 22

(b) 16

(c) 10

(d) 20

2. The NOR gate output will be high if the two inputs are \_\_\_\_\_

(a) 00

(b) 01

(c) 10

(d) 11

3. An \_\_\_\_\_ is a group of eight adjacent is  
(a) Pair (b) Quad  
(c) Octet (d) None
4. \_\_\_\_\_ is a way of representing a Boolean expression using min terms or product terms.  
(a) POS (b) OPS  
(c) EPS (d) SOP
5. The combinational circuits that modify the binary data into N output lines are known as \_\_\_\_\_  
(a) Decoder (b) Encoder  
(c) Both (a) and (b) (d) None
6. 1's complement of 100100 \_\_\_\_\_  
(a) 100100 (b) 000000  
(c) 111111 (d) 011011
7. A flip flop is a device which stores a \_\_\_\_\_ of data.  
(a) a single word (b) a single byte  
(c) a single bit (d) none
8. In S-R flip flop, if  $Q = 0$  the output is said to be \_\_\_\_\_  
(a) Set (b) Reset  
(c) Previous state (d) Current state



9. A \_\_\_\_\_ is using a cascade of flip flops where the output of the one flip flop is connected to the input of the next. They share a single clock signal, which causes the data stored in the system to shift from one location to the next.

(a) Counter (b) Shift register

(c) Both (a) and (b) (d) None

10. PIPO stands for \_\_\_\_\_

(a) Product in product out

(b) Pipe in pipe out

(c) Parallel in parallel out

(d) None

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) What do you mean by Gray code?

Or

(b) Convert the decimal numbers 36 and 140 into its binary numbers.

12. (a) Expand and give a brief note on sop.

Or

(b) Express the usage of Don't care conditions in K-Map.

13. (a) Define and give a brief note on Encoder.

Or

(b) Write short note on compliments.

14. (a) What is RS Flip Flop?

Or

(b) Draw the logic diagram and write down characteristic table for Edge triggered JK Flip Flop.

15. (a) Describe about Universal shift register.

Or

(b) What is serial In and parallel out shift register?

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) What are the different types of Number system available? Explain each one of them.

Or

- (b) Write short note on the following  
(i) ASCII code (ii) Excess – 3 code

17. (a) Simplify the Boolean Expression:

$F(a,b,c,d) = \Sigma(0,1,4,5,8,9,10,12,13,14)$  using 4 variable K-Map.

Or

- (b) Describe the basic theorems of Boolean Algebra.

18. (a) Write short note on the following:

(i) Unsigned Binary Numbers.

(ii) Sign Magnitude Form.

Or

- (b) What is Decoder? Give a brief note on seven segment decoder.

19. (a) With neat Logic diagram and characteristic table explain JK Master Slave Flip Flop.

Or

- (b) What do you mean by Edge Triggered D Flip Flop?

20. (a) Discuss in detail about parallel In and serial out shift Register.

Or

- (b) With neat diagram, explain serial In and serial out shift register.

Code No. : 20493 E Sub. Code : CSCS 31

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

Third Semester

Computer Science

Skill Based Subject — DIGITAL DESIGN

(For those who joined in July 2021-2022)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- What is the decimal equivalent of  $0.1101_2$ ?  
(a) 0.78125 (b) 0.8125  
(c) 0.9375 (d) 0.6875
- Which code is used in IBM make devices?  
(a) BCD (b) GRAY code  
(c) ASC II (d) EBCDIC

3.  $AB + \bar{A}C + BC = \text{_____}$

- (a)  $(A + B)(\bar{A} + C)$  (b)  $AB + \bar{A}C$   
(c)  $AB + BC$  (d)  $\bar{A}C + BC$

4. How many fundamental products are there for three variables?

- (a) 2 (b) 3  
(c) 4 (d) 8

5.  $A \oplus B = \text{_____}$

- (a)  $A + B$  (b)  $AB + \bar{A}\bar{B}$   
(c)  $A\bar{B} + \bar{A}B$  (d)  $\bar{A} + \bar{B}$

6. 2's complement of  $-48_{10}$  is \_\_\_\_\_

- (a) 11010000 (b) 10110000  
(c) 01010000 (d) 01001111

7. Which of the following serve as key memory elements?

- (a) Switches (b) Relays  
(c) Flip flops (d) Quartz crystals

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8. If the output responds immediately to input signals, then the flip flop is \_\_\_\_\_

- (a) transparent  
(b) positive edge triggered  
(c) negative edge triggered  
(d) neutral

9. Which of the following flip flop is not used to construct registers?

- (a) RS (b) D  
(c) JK (d) T

10. Which of the following is used to store a binary number?

- (a) Array (b) Register  
(c) Cell (d) Counter

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

- (a) (i) Convert the binary 110.001 to a decimal number.  
(ii) A computer has 2 MB memory. What is the decimal equivalent of 2 MB?

Or

- (b) Write a note on ASCII.

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12. (a) Write the consensus theorem.

Or

(b) What is the simplified Boolean equation for the following logic equation?

$$F(A, B, C, D) = \sum m(7, 9, 10, 11, 12, 13, 14, 15)$$

13. (a) Write a note on multiplexer.

Or

(b) Perform binary addition  $(83)_{10}$  and  $(-16)_{10}$ .

14. (a) Write a note on flip flops.

Or

(b) Write a note on edge triggered D flip flop.

15. (a) Explain serial in serial out register.

Or

(b) Explain parallel in parallel out register.

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[P.T.O.]

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)  
Each answer should not exceed 600 words.

16. (a) Tabulate the BCD representation and excess - 3 code for decimal 0 - 9.

Or

- (b) Explain the universal logic gates.

17. (a) Construct the truth table for  
(i) three input NOR gate  
(ii) three input AND gate.

Or

- (b) Write the SOP and POS using Karnaugh map.

$$F(A, B, C, D) = \prod M(0, 1, 2, 4, 5, 14) + \prod d(8, 9, 11, 12, 13, 15)$$

18. (a) Add  $(-43)_{10}$  and  $(-78)_{10}$  in binary form.

Or

- (b) Explain 7 segment decoder.

19. (a) Explain edge triggered RS flip flop.

Or

- (b) Explain JK master - slave flipflop.

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20. (a) Explain serial in parallel out register.

Or

- (b) Explain universal shift register.

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Code No. : 10470 E Sub. Code : CSCS 41

B.Sc. (CBCS) DEGREE EXAMINATION,  
APRIL 2023

Fourth Semester

Computer Science

Skill Based Subject — COMPUTER ARCHITECTURE

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. A sequence of microinstructions constitutes a
- (a) System Program
  - (b) Micro Programming
  - (c) Memory Program
  - (d) Macro Programming

2. In the \_\_\_\_\_ organization, the control logic is implemented with gates, flip-flops, decoders, and other digital circuits.
- (a) Microprogrammed
  - (b) Micro Controlled
  - (c) Hardwired
  - (d) System controlled
3. The \_\_\_\_\_ provides arithmetic and logic operations. In addition, the CPU must provide shift operations.
- (a) ALU
  - (b) Control word
  - (c) Stack
  - (d) Stack Pointers
4. \_\_\_\_\_ Mnemonic Stands for Branch If Zero.
- (a) BIZ
  - (b) BZ
  - (c) BIZO
  - (d) BNZ
5. \_\_\_\_\_ algorithm gives a procedure for multiplying binary integers in signed-2's complement representation.
- (a) Array Multiplier
  - (b) Cubicle
  - (c) Booth
  - (d) Stall

6. \_\_\_\_\_ provide a permanent record on paper of computer output data or text.

- (a) Scanner                      (b) Printer  
(c) Monitor                      (d) Keyboard

7. The ASCII code contains \_\_\_\_\_ characters that can be printed.

- (a) 95                              (b) 94  
(c) 96                              (d) 97

8. A \_\_\_\_\_ command is issued to activate the peripheral and to inform it what to do.

- (a) Status                      (b) Control  
(c) I/O                              (d) Output

9. The \_\_\_\_\_ memory is employed in computer systems to compensate for the speed differential between main memory access time and processor logic.

- (a) Main                              (b) Cache  
(c) Auxiliary                      (d) Associative

10. A memory unit accessed by content is called

- (a) CMA                              (b) DMA  
(c) CAM                              (d) DAM

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Write Short notes on Operation Code.

Or

(b) Discuss about Hardwired Control and Micro Programmed Control.

12. (a) Discuss about Control Word.

Or

(b) Write short notes on Arithmetic Instructions.

13. (a) What is Divide Overflow? Explain.

Or

(b) State the notes on Register Configuration for Floating point Operations.

14. (a) Write Short notes on CRT.

Or

(b) Discuss I/O Interface Commands.



15. (a) Write short notes on Memory Hierarchy.

Or

(b) Draw the Block diagram of associative memory.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) List out and explain the various Computer Instructions.

Or

(b) Discuss about Address Sequencing.

17. (a) Describe the Stack Organization.

Or

(b) Discuss about Program Control Instructions.

18. (a) Draw Flowchart for multiply operation.

Or

(b) Write detail notes on Floating Point Multiplication with suitable example.

19. (a) Discuss about Asynchronous Data Transfer.

Or

(b) Draw the Circuit diagram of 4 × 4 FIFO buffer.

20. (a) Discuss about Main Memory.

Or

(b) Write detail notes on Virtual Memory.

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(6 pages)

Reg. No. : .....

Code No. : 20494 E Sub. Code : CSCS 41

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

Fourth Semester

Computer Science

Skill Based Subject — COMPUTER ARCHITECTURE

(For those who joined in July 2021-2022)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- Each word in control memory contains within it a \_\_\_\_\_  
(a) Macro instruction (b) Micro instruction  
(c) Instruction set (d) Code set
- The \_\_\_\_\_ register holds the operand read from memory.  
(a) Data (b) Address  
(c) Instruction (d) Input

3. The \_\_\_\_\_ in digital computers is essentially a memory unit with an address register that can count only.

- (a) Stack (b) Register  
(c) ROM (d) RAM

4. There is one register in the computer called the \_\_\_\_\_ or PC that keeps track of the instructions in the program stored in memory.

- (a) Instruction counter (b) Program counter  
(c) Memory counter (d) Stack counter

5. \_\_\_\_\_ is the part of a processor unit that executes arithmetic operations.

- (a) Arithmetic processor  
(b) Arithmetic counter  
(c) Arithmetic memory  
(d) Arithmetic bus

6. The \_\_\_\_\_ printer contains a wheel with the characters placed along the circumference.

- (a) Laser (b) Dot Matrix  
(c) Do wheel (d) Daisy wheel

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7. ASCII uses \_\_\_\_\_ bits to code 128 characters.

- (a) 8 (b) 5  
(c) 7 (d) 6

8. A \_\_\_\_\_ transmission can send and receive data in both directions simultaneously.

- (a) full-duplex (b) half-duplex  
(c) semi duplex (d) duplex

9. Integrated circuit \_\_\_\_\_ chips are available in two possible operating modes, static and dynamic.

- (a) ROM (b) RAM  
(c) ERAM (d) EROM

10. The \_\_\_\_\_ algorithm selects for replacement the item that has been least recently used by the CPU.

- (a) FIFO (b) LIFO  
(c) LRU (d) MRU

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Compare instruction codes and operation code.

Or

(b) State the phases of instruction cycle.

12. (a) Write short notes on ALU.

Or

(b) Discuss about logical and bit manipulation instructions.

13. (a) Draw the flowchart for add and subtract operations.

Or

(b) Mention the four parts of multiplication algorithm.

14. (a) Write short notes on ASCII.

Or

(b) State the differences that exist between the central computer and each peripheral.

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Page 4 Code No. : 20494 E

[P.T.O.]

15. (a) Discuss about ram chip.

Or

(b) Discuss about magnetic disks.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Discuss about computer registers.

Or

(b) Write detail notes on control memory.

17. (a) Write detail notes on instruction formats.

Or

(b) List out and explain the data transfer instructions.

18. (a) Explain booth algorithm in detail.

Or

(b) Discuss about floating point addition and subtraction.

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19. (a) Draw the block diagram of a typical asynchronous communication interface.

Or

(b) Write detail notes on DMA.

20. (a) Write detail notes on associative memory.

Or

(b) Discuss about cache memory in detail.

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(6 pages)

Reg. No. : .....

Code No. : 10113 E Sub. Code : SECS 6 C/  
AECS 63

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Sixth Semester

Computer Science

Major Elective -- NEURAL NETWORKS

(For those who joined in July 2017-2020 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Neural networks can be used in different fields. Such as
  - (a) Classification
  - (b) Data processing
  - (c) Compression
  - (d) All of the above

2. Function of dendrites is?
  - (a) Receptors
  - (b) Transmitter
  - (c) Both receptor and transmitter
  - (d) None of the mentioned
3. What is perceptron?
  - (a) single layer feed-forward neural network with pre-processing
  - (b) auto-associative neural network
  - (c) double layer auto-associative neural network
  - (d) a neural network that contains feedback
4. The network that involves backward links from output to the input and hidden layers is called
  - (a) Self organizing maps
  - (b) Perceptrons
  - (c) Recurrent neural network
  - (d) Multi layered perceptron
5. What is an auto-associative network?
  - (a) a neural network that contains no loops
  - (b) a neural network that contains feedback
  - (c) a neural network that has only one loop
  - (d) a single layer feed-forward neural network with pre-processing

6. What is synchronous update in hopfield model?
- (a) all units are updated simultaneously
  - (b) a unit is selected at random and its new state is computed
  - (c) a predefined unit is selected and its new state is computed
  - (d) none of the mentioned

In self organizing network, how is layer connected to output layer?

- (a) some are connected
- (b) all are one to one connected
- (c) each input unit is connected to each output unit
- (d) none of the mentioned

Pattern recall takes more time for?

- (a) MLFNN
- (b) Basis function
- (c) Equal for both MLFNN and basis function
- (d) None of the mentioned

Multilayer Perceptron (MLP), Convolutional Neural Network (CNN) and Recurrent Neural Networks (RNN) are used for

- (a) knowledge extraction
- (b) healthcare
- (c) weather forecasting
- (d) none of the above

10. What are the major components of the intrusion detection system?

- (a) Analysis Engine
- (b) Event provider
- (c) Alert Database
- (d) All of the mentioned

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Write note on artificial neural network.

Or

- (b) Write note on any two artificial network terminologies.

12. (a) Derive Hebbian and perceptron-learning rule.

Or

- (b) Explain about multilayer perceptron.

13. (a) Explain Continuous Hopfield net.

Or

- (b) Write note on local minima and Global minima.

14. (a) What is counter propagation network?

Or

(b) Explain the application procedure for full CPN.

15. (a) Write note on protein folding.

Or

(b) Describe about forecasting the application of neural network.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Describe biological neural network.

Or

(b) Explain in detail about network architecture of basic building blocks of artificial neural networks.

17. (a) Write in detail about Mc-Culloch-Pits neuron-model

Or

(b) Illustrate single layer perceptron.

18. (a) Write about Discrete Hopfield network training algorithm.

Or

(b) Explain Back propagation network.

19. (a) Elaborate Kohonen self-organizing feature maps.

Or

(b) Express about Forward only propagation network.

20. (a) Explain about clinical diagnosis in health care application of neural network.

Or

(b) Describe about intrusion-detection algorithm.

Code No. : 20096 E Sub. Code : SMCS 31/ SMSE 31

B.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2023

Third Semester

Computer Science / Software Engineering - Core

JAVA PROGRAMMING

(For those who joined in July 2017-2019)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- 1. Which of these can be returned by the operator &?
  - (a) Integer
  - (b) Boolean
  - (c) Character
  - (d) Integer or Boolean
- 2. Generics does not work with?
  - (a) Set
  - (b) List
  - (c) Tree
  - (d) Array

- 7. Which of these modifiers can be used for a variable so that it can be accessed from any thread or parts of a program?
  - (a) transient
  - (b) volatile
  - (c) global
  - (d) No modifier is needed
- 8. What is a listener in context to event handling?
  - (a) A listener is a variable that is notified when an event occurs
  - (b) A listener is a object that is notified when an event occurs
  - (c) A listener is a method that is notified when an event occurs
  - (d) None of the mentioned
- 9. When we invoke repaint () for a java.awt. Component object, the AWT invokes the method:
  - (a) draw()
  - (b) show()
  - (c) paint()
  - (d) update()
- 10. In which places can put the event handling code?
  - (a) Same class
  - (b) Other class
  - (c) Annonymous class
  - (d) All mentioned above

- 3. Which of these operators is used to allocate memory for an object?
  - (a) malloc
  - (b) alloc
  - (c) new
  - (d) give
- 4. A class member declared protected becomes a member of subclass of which type?
  - (a) public member
  - (b) private member
  - (c) protected member
  - (d) static member
- 5. Which of these is a mechanism for naming and visibility control of a class and its content?
  - (a) Object
  - (b) Packages
  - (c) Interfaces
  - (d) None of the Mentioned
- 6. Thread priority in Java is?
  - (a) Integer
  - (b) Float
  - (c) double
  - (d) long

PART B — (5 × 5 = 25 marks)

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

Either answer should not exceed 250 words

- 11. (a) Describe the bitwise operators with suitable examples.
 

Or

 (b) Explain What is dynamic initialization of a variables.
- 12. (a) Explain about the various command line argument and its usage.
 

Or

 (b) Write a short note on method over riding.
- 13. (a) Write a steps to create and import packages.
 

Or

 (b) Illustrate Java thread model with suitable diagram.
- 14. (a) Write a short note on Applet Display method.
 

Or

 (b) Describe about Mouse Event.

15. (a) Explain working with Fonts and Colors in AWT class.

Or

(b) Write a short note on Menu bars and Menus.

PART C — (5 × 8 = 40 marks)

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

Either answer should not exceed 600 words

16. (a) Explain the features of java and say why it is important?

Or

(b) Explain the usage of constructors with suitable example.

17. (a) Write a program using Recursion function.

Or

(b) Distinguish Inheritance and Interface with suitable example.

18. (a) Write a program to calculate area of various shapes by importing shape package.

Or

(b) Explain in detail about Thread Lifecycle with neat sketch.

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19. (a) Explain in detail about various methods of Applet class.

Or

(b) Discuss about Event classes with suitable syntax.

20. (a) Expound working with Frame Windows in AWT class.

Or

(b) Explain various control in AWT with suitable example.

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Code No. : 20097 E Sub. Code : SMCS 32

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.Third Semester  
Computer Science – Core  
COMPUTER ARCHITECTURE

(For those who joined in July 2017-2019)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. An \_\_\_\_\_ is a group of bits that instruct the computer to perform a specific operation.
- (a) Instruction code (b) Opcode  
(c) operation code (d) accumulator

2. Computers that have a single processor register usually assign to it the name \_\_\_\_\_
- (a) Instruction code (b) Opcode  
(c) operation code (d) accumulator
3. The register that holds the address for stack is called a \_\_\_\_\_
- (a) Stack Pointer (b) LIFO  
(c) Register stack (d) Memory Stack
4. A collection of a finite number of flipflops is a \_\_\_\_\_
- (a) Words (b) Register  
(c) Both (a) and (b) (d) None
5. Which of the following format is used to store data in a computer?
- (a) BCD (b) Octal  
(c) Decimal (d) Hexadecimal

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6. \_\_\_\_\_ Algorithm gives a procedure for multiplying binary integers in signed 2'S complement representation.
- (a) Addition  
(b) Subtraction  
(c) Multiplication/Division  
(d) Booth
7. Input or output devices attached to the computer are also called \_\_\_\_\_
- (a) CPU (b) ALU  
(c) Peripherals (d) monitor
8. \_\_\_\_\_ is issued to activate the peripheral.
- (a) Control command  
(b) status command  
(c) Data input command  
(d) Data output command
9. The memory unit that communicates directly with the CPU is called \_\_\_\_\_
- (a) Main memory (b) auxiliary memory  
(c) Cache memory (d) multiprogramming

10. Which is the fastest memory
- (a) auxiliary (b) virtual  
(c) cache (d) associative

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Discuss about Instruction codes.  
Or  
(b) Explain Address Sequencing.
12. (a) Explain about micro operations with an example.  
Or  
(b) Explain Addressing modes.
13. (a) Short notes on hardware implementation of Division algorithm.  
Or  
(b) Comment on multiplication hardware algorithm.
14. (a) Draw the I/O bus and interface connection and Explain it.  
Or  
(b) Explain about priority interrupt.

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[P.T.O.]

15. (a) Difference between RAM and ROM.

Or

(b) Describe the page replacement principle in virtual memory.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)  
Each answer should not exceed 600 words.

16. (a) Discuss the types of instruction in the instruction cycle.

Or

(b) Explain about control memory.

17. (a) Explain:

(i) Register stack

(ii) Memory stacks.

Or

(b) Write a short notes on conditional branch instructions.

18. (a) Explain the Booth Multiplication Algorithm.

Or

(b) Draw a flowchart for addition and subtraction operation in floating point.

Page 5 Code No. : 20097 E

19. (a) Discuss about modes of transfer.

Or

(b) Write detail note on DMA

20. (a) Write note on main memory.

Or

(b) What is cache memory? Explain direct and set associative mapping.

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FIN

(6 pages)

Reg. No. : .....

Code No. : 20098 E Sub. Code : SMCS 33/  
SMSE 33

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

Third Semester

Computer Science / Software Engineering – Core

DATA STRUCTURE

(For those who joined in July 2017 – 2019)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. \_\_\_\_\_ is a finite set of instructions that accomplishes a particular task.
  - (a) Algorithm
  - (b) Program
  - (c) Problem specification
  - (d) Input
  
6. The height of a heap with n elements is
  - (a)  $\log_2(n)$
  - (b)  $\log_2(n+1)$
  - (c)  $\log(n^2)$
  - (d)  $\frac{\log_2(n)}{2}$
7. In directed graph on n vertices, the maximum number of edges
  - (a)  $\frac{n(n-1)}{2}$
  - (b)  $n(n-1)$
  - (c)  $\frac{n(n+1)}{2}$
  - (d)  $n(n+1)$
8. Kruskal's algorithm involves sorting of the edges, which takes \_\_\_\_\_ time.
  - (a)  $o(e \log e)$
  - (b)  $o(\log e)$
  - (c)  $o(v \log e)$
  - (d)  $o(e \log v)$
9. In insertion sort, the worst case insert make \_\_\_\_\_ comparisons before making the insertion.
  - (a)  $i+1$
  - (b)  $i-1$
  - (c)  $i^2$
  - (d)  $i^3$
10. The loading density of a hash table is  $\alpha =$  \_\_\_\_\_
  - (a)  $n(sb)$
  - (b)  $\frac{n}{(sb)}$
  - (c)  $\frac{sb}{n}$
  - (d)  $\frac{s+b}{n}$

2. The \_\_\_\_\_ function produces a new, empty array of the appropriate size.
  - (a) Create (j, list)
  - (b) New (j, list)
  - (c) Create Array (j, list)
  - (d) New Array (j, list)
3. A stack is also known as
  - (a) FIFO
  - (b) FILO
  - (c) LIFO
  - (d) LILO
4. In \_\_\_\_\_, each node has exactly one pointer field.
  - (a) Single linked list
  - (b) Double linked list
  - (c) Circular linked list
  - (d) None of the above
5. The \_\_\_\_\_ of a tree is defined to be the maximum level of any node in the tree.
  - (a) height
  - (b) leaf
  - (c) root
  - (d) siblings

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Define algorithm. Listout and explain various characteristics of an algorithm.  
Or  
(b) How to represent a multidimensional array? Explain.
12. (a) Illustrate stack operation with example.  
Or  
(b) How to declare and use doubly linked list?
13. (a) Explain various properties of binary tree.  
Or  
(b) Write a short note on priority queue.
14. (a) Illustrate the adjacency list representation of graph.  
Or  
(b) Write a prim's algorithm. Explain.

15. (a) Explain insertion sort with example.

Or

(b) What you meant by Hash table? Explain.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Discuss space complexity.

Or

(b) Analyze the time and space requirements of matrix multiplication.

17. (a) Write a function to evaluate postfix expression. Explain with example.

Or

(b) Explain in detail about linked list representation of sparse matrix.

18. (a) Describe binary tree traversals.

Or

(b) Explain the following operations on Binary search tree

(i) insertion

(ii) deletion.

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19. (a) Briefly explain BFS and DFS with example.

Or

(b) Explain single source shortest path.

20. (a) Discuss merge sort with example.

Or

(b) Define Heap sort. How to adjust a max heap? Explain.

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Reg. No. : .....

Code No. : 10103 E Sub. Code : SMCS 52/  
SMSE 52/AMCS 52

B.Sc. (CBCS) DEGREE EXAMINATION,  
APRIL 2023.

Fifth Semester

Computer Science/Software Engineering — Core

DATA COMMUNICATION AND  
COMPUTER NETWORK

(For those who joined in July 2017 – 2020)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. OSI stands for
  - (a) Open System Interconnection
  - (b) Operating System Interface
  - (c) Optical Service Implementation
  - (d) None of the mentioned
  
6. The signal rate is the number signal elements sent in \_\_\_\_\_ s.
  - (a) 1
  - (b) 2
  - (c) 0
  - (d) 4
  
7. The data link layer takes the packets from \_\_\_\_\_ and encapsulates them into frames for transmission.
  - (a) network layer
  - (b) physical layer
  - (c) transport layer
  - (d) application layer
  
8. Which one of the following is a data link protocol?
  - (a) ethernet
  - (b) point to point protocol
  - (c) hdlc
  - (d) all of the mentioned
  
9. \_\_\_\_\_ refers to the set of standards that define communication for wireless LANs.
  - (a) IEEE 802.11
  - (b) IEEE 804.11
  - (c) IEEE 806.11
  - (d) None of these
  
10. Which multiple access technique is used by IEEE 802.11 standard for wireless LAN?
  - (a) CDMA
  - (b) CSMA/CA
  - (c) ALOHA
  - (d) None of the mentioned

2. The \_\_\_\_\_ duplex mode, the signal is sent in both directions at the same time.
  - (a) Half
  - (b) Simple
  - (c) Full
  - (d) None of the mentioned
  
3. Coaxial cable has conductors with \_\_\_\_\_
  - (a) a common axis
  - (b) equal resistance
  - (c) the same diameter
  - (d) none of these
  
4. \_\_\_\_\_ is the number of occurrences of a repeating event per unit of time.
  - (a) Modulation
  - (b) Frequency
  - (c) Signal
  - (d) All of these
  
5. The resources needed for communication between end systems are reserved for the duration of the session between end systems in \_\_\_\_\_.
  - (a) Packet switching
  - (b) Circuit switching
  - (c) Line switching
  - (d) Frequency switching

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PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) List the layers of the Internet model.  
Or  
(b) Why are protocols and standards needed?
  
12. (a) The frequency is 60Hz. Find the period T?  
Or  
(b) What is Digital and Analog signal?
  
13. (a) Explain about Circuit Switch Network.  
Or  
(b) What is dial-up modem Technology?
  
14. (a) Discuss about Single bit Errors.  
Or  
(b) What is hamming distance?
  
15. (a) Explain IEEE 802.11 architecture.  
Or  
(b) Explain need of IPv4.

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[P.T.O.]

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Discuss in detail about OSI layers with neat diagram.

Or

- (b) Write about the addressing.

17. (a) Write in detail about Time and Frequency domains.

Or

- (b) With neat diagram explain about Guided media.

18. (a) List four major components of a packet switch and their functions.

Or

- (b) What is LATA? What are intra-LATA and inter-LATA services?

19. (a) What kind of error is undetectable by checksum?

Or

- (b) Write and explain Stop and wait protocol.

Page 5 Code No. : 10103 E

20. (a) Write in details about Sliding window protocols.

Or

- (b) What are three domains of the domain name space?
- 

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(6 pages)

Reg. No. : .....

Code No.: 10105 E      Sub. Code: SMCS 61/  
SMSE 61/  
AMCS 61

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Sixth Semester

Computer Science/Software Engineering – Core

OPERATING SYSTEM

(For those who joined in July 2017 – 2020)

Time : Three hours      Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Software may trigger an interrupt by executing a special operation called a \_\_\_\_\_
  - (a) system processes
  - (b) system call
  - (c) system daemons
  - (d) interrupt

6. A semaphore is shared integer variable
  - (a) that cannot drop below zero
  - (b) that cannot more than zero
  - (c) that cannot drop below one
  - (d) that cannot more than one
7. The offset 'd' of the logical address must be
  - (a) Greater than segment limit
  - (b) Between 0 and segment limit
  - (c) Between 0 and the segment number
  - (d) Greater than the segment number
8. In internal fragmentation, memory is internal to a partition and
  - (a) is being used
  - (b) is not being used
  - (c) is always used
  - (d) none of the mentioned
9. When two users keep a subdirectory in their own directories, the structure being referred to is
  - (a) tree structure
  - (b) cyclic graph directory structure
  - (c) two level directory structure
  - (d) acyclic graph directory

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2. \_\_\_\_\_ storage loses its contents when the power to the device is removed.
  - (a) volatile      (b) non-volatile
  - (c) Solid-state disks      (d) Both (a) and (b)
3. What is inter process communication?
  - (a) Communication within process
  - (b) Communication between two process
  - (c) Communication between two threads of same process
  - (d) Process to thread communication
4. When the process terminates
  - (a) It is removed from all queues
  - (b) It is removed from all, but the job queue
  - (c) Its process control block is de-allocated
  - (d) Its process control block is never de-allocated
5. Mutual exclusion can be provided by the
  - (a) Mutex Locks
  - (b) Binary Semaphores
  - (c) Single Locks
  - (d) Both (a) and (b)

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10. A \_\_\_\_\_ is effectively a pointer to another file or subdirectory.
  - (a) Link      (b) Command
  - (c) Node      (d) Reference

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Determine the Operating System Generation.  
Or  
(b) Describe about System Programs.
12. (a) Write short notes on creation of Process.  
Or  
(b) Discuss First-come, First-Served Scheduling in CPU.
13. (a) Determine about Peterson's Solution.  
Or  
(b) Explain the following
  - (i) Dead Lock and Starvation
  - (ii) Priority Inversion

Page 4 Code No. : 10105 E  
[P.T.O.]

14. (a) Clarify the basic concepts of Demand Paging.

Or

(b) Difference between Logical Versus Physical Address Space.

15. (a) Summarize the File attributes.

Or

(b) How to select a disk scheduling algorithm?

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)  
Each answer should not exceed 600 words.

16. (a) Illustrate the Operating System Design and Implementation.

Or

(b) Define Operating System. What does Operating System do?

17. (a) Explain the operation on processes.

Or

(b) Elaborate the concept of Multiple-Processor Scheduling.

Page 5 Code No. : 10105 E

18. (a) Define Semaphores. Explain its usage and implementation with an example.

Or

(b) Discuss in detail about Deadlock Avoidance.

19. (a) Illustrate the characteristics of Memory Management.

Or

(b) Explain the following

(i) LRU-Approximation Page Replacement

(ii) Optimal Page Replacement

20. (a) Describe about File System Implementation.

Or

(b) Write a detailed notes on SCAN Scheduling and C-SCAN Scheduling.

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Code No. : 20105 E Sub. Code : SMCS 61/  
SMSE 61/AMCS 61

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

Sixth Semester

Computer Science/Software Engineering – Core

OPERATING SYSTEM

(For those who joined in July 2017-2020)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- 1. Using transient code, \_\_\_\_\_ the size of the operating system during program execution.
  - (a) maintains
  - (b) changes
  - (c) increases
  - (d) decreases

- 6. A deadlock avoidance algorithm dynamically examines the \_\_\_\_\_ to ensure that a circular wait condition can never exist.
  - (a) operating system
  - (b) resources
  - (c) system storage state
  - (d) resource allocation state

- 7. The operating system maintains a \_\_\_\_\_ table that keeps track of how many frames have been allocated, how many are there, and how many are available.
  - (a) memory
  - (b) mapping
  - (c) page
  - (d) frame

- 8. Swapping \_\_\_\_\_ be done when a process has pending I/O, or has to execute I/O operations only into operating system buffers.
  - (a) must never
  - (b) maybe
  - (c) can
  - (d) must

- 9. The main memory accommodates
  - (a) CPU
  - (b) User processes
  - (c) Operating system
  - (d) All of the mentioned

- 2. BIOS is used
  - (a) By Operating System
  - (b) By compiler
  - (c) By interpreter
  - (d) By application software
- 3. In operating system, each process has its own
  - (a) open files
  - (b) pending alarms, signals, and signal handlers
  - (c) address space and global variables
  - (d) all of the mentioned
- 4. In a timeshare operating system, when the time slot assigned to a process is completed, the process switches from the current state to?
  - (a) Suspended state
  - (b) Terminated state
  - (c) Ready state
  - (d) Blocked state
- 5. What are the two atomic operations permissible on semaphores?
  - (a) wait
  - (b) stop
  - (c) hold
  - (d) none of the mentioned

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- 10. The information about all files is kept in
  - (a) operating system
  - (b) separate directory structure
  - (c) swap space
  - (d) none of the mentioned

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

- 11. (a) What are the services of operating system? Explain.  
Or  
(b) Describe the concept of computer system architecture.
- 12. (a) Elaborate the basic concept of scheduling criteria  
Or  
(b) Summarize the real time CPU scheduling.
- 13. (a) What is semaphore? What is the use of it?  
Or  
(b) Point out the methods for handling deadlocks.

14. (a) Explain the allocation of frames in virtual memory management.

Or

(b) Discuss the contiguous memory allocation.

15. (a) Bring out the need of file system structures.

Or

(b) Write about the methods for file allocation.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Examine the generation of operating system.

Or

(b) Determine the design and implementation of operating system.

17. (a) Outline the concept of inter process communication.

Or

(b) Illustrate the implementation of thread scheduling.

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18. (a) Identify the classic problems of synchronization.

Or

(b) Elaborate the deadlock avoidance with simple example.

19. (a) Discuss the implementation of page replacement algorithms.

Or

(b) Explain the demand paging using in virtual memory management.

20. (a) Demonstrate the disk structure for mass storage.

Or

(b) Formulate the implementation of free space management.

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Reg. No. : \_\_\_\_\_

Code No. : 10107 E Sub. Code : SMCS 63

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Sixth Semester

Computer Science – Core

DATA WAREHOUSING AND DATA MINING

(For those who joined in July 2017-2019)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. \_\_\_\_\_ databases are owned by particular departments or business groups.
- (a) Informational  
(b) Operational  
(c) Both informational and operational  
(d) Flat

6. \_\_\_\_\_ may be defined as the data objects that do not comply with the general behavior or model of the data available.
- (a) Outlier Analysis (b) Evolution Analysis  
(c) Prediction (d) Classification
7. From where are classification rules extracted?
- (a) Branches (b) Decision Tree  
(c) Siblings (d) Root node
8. How to define Classification accuracy?
- (a) A subdivision of a set of examples into a number of classes  
(b) The task of assigning a classification to a set of examples  
(c) Measure of the accuracy of the classification of a concept that is given by a certain theory  
(d) None of these
9. Which is needed by K-means clustering?
- (a) defined distance metric  
(b) number of clusters  
(c) initial guess as to cluster centroids  
(d) all of these

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2. Business Intelligence and data warehousing is used for \_\_\_\_\_
- (a) Forecasting  
(b) Data Mining  
(c) Analysis of large volumes of product sales data  
(d) All of the above
3. Online Analytical Processing (OLAP) is a technology that is used to create software.
- (a) Decision support (b) Forecasting  
(c) Informational (d) None
4. Data warehouses and OLAP tools are based on \_\_\_\_\_ data model.
- (a) Single dimension (b) Two dimension  
(c) Multidimensional (d) None
5. Which of the following is the right approach to Data Mining?
- (a) Infrastructure, exploration, analysis, exploitation, interpretation  
(b) Infrastructure, exploration, analysis, interpretation, exploitation  
(c) Infrastructure, analysis, exploration, interpretation, exploitation  
(d) None of these

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10. A \_\_\_\_\_ is the complete set of genes of an organism.
- (a) Genome (b) proteome  
(c) nucleotides (d) Genomics

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Write note on (i) meta data (ii) Data marts
- Or
- (b) What are the design considerations of building a data warehouse?
12. (a) What are the five decision support tools?
- Or
- (b) Mention the OLAP guidelines.
13. (a) Explain Architecture of data mining.
- Or
- (b) Describe about data transformation.
14. (a) What is Mining Multilevel Association Rules?
- Or
- (b) Write about Baye's theorem.

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[P.T.O.]

15. (a) Mention A Categorization of Major Clustering Methods.

Or

(b) Write note on Data Mining for Financial Data Analysis.

PART C -- (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)  
Each answer should not exceed 600 words.

16. (a) Explain the Overall Architecture of data warehouse.

Or

(b) Describe Data ware house administration and management.

17. (a) Illustrate categorization of OLAP Tools.

Or

(b) Discuss about multi dimensional versus multi relational OLAP.

18. (a) What is Data mining? Explain.

Or

(b) Summarize about data integration and transformation.

19. (a) Write in detail about Naïve Bayesian classification.

Or

(b) Explain linear regression.

20. (a) What are the Types of Data in Cluster Analysis?

Or

(b) Expand and explain about DBSCAN.

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PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer:

1. The process of adjusting the weight is known as
  - (a) activities
  - (b) synchronization
  - (c) learning
  - (d) perception
  
6. \_\_\_\_\_ is a process of transforming a crisp set to a fuzzy set.
  - (a) Defuzzification
  - (b) Fuzzification
  - (c) Neural Network
  - (d) Genetic Algorithm
  
7. \_\_\_\_\_ represents the fuzzy logic.
  - (a) IF-THEN rules
  - (b) IF-THEN-ELSE rules
  - (c) Both (a) and (b)
  - (d) None of the above
  
8. Uncertainty can be represented by \_\_\_\_\_.
  - (a) Entropy
  - (b) Fuzzy logic
  - (c) Probability
  - (d) All of the above
  
9. The principle of GA
  - (a) Initiates genetic and natural selection by a computer program
  - (b) Typical population size is from few dozen to thousand
  - (c) It may be discrete, multimodal etc
  - (d) None of the above
  
10. \_\_\_\_\_ is the process of choosing two parents from the propagation for crossing.
  - (a) Encoding
  - (b) Selection
  - (c) Crossover
  - (d) Mutation

2. Any layer that is formed between the input and output layer is called
  - (a) Competitive Layer
  - (b) Hidden layer
  - (c) Feed forward layer
  - (d) Multi layer feed forward
  
3. Which learning algorithm is applied to multilayer feed-forward network consisting of processing elements with activation function
  - (a) Adaline
  - (b) Madaline
  - (c) Hebb Network
  - (d) Back Propagation
  
4. Which rule is used for finding the weights of an associative memory neural network
  - (a) Hebb Rule
  - (b) Self organized map
  - (c) Single layer rule
  - (d) Multi layer rule
  
5. A Fuzzy set whose membership function has atleast one element x in the universe whose membership value is unity is called \_\_\_\_\_.
  - (a) normal fuzzy set
  - (b) subnormal fuzzy set
  - (c) convex fuzzy set
  - (d) non convex fuzzy set

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b). Each answer should not exceed 250 words.

11. (a) Compare Biological Neuron and Artificial Neuron.
 

Or

 (b) Describe biological Neural Network.
  
12. (a) Define Adaline. Draw the Architecture of Adaline Model.
 

Or

 (b) Describe the activation function of BAM.
  
13. (a) Consider the following two fuzzy sets  $A = \{0.3/x_1 + 0.7/x_2 + 1/x_3\}$  and  $B = \{0.8/y_1 + 0.9/y_2\}$  Perform the Cartesian product over these given Fuzzy Sets.
 

Or

 (b) Describe Fuzzy Composition.
  
14. (a) Illustrate qualitative in Fuzzy Reasoning.
 

Or

 (b) Write about Aggregation of Fuzzy Rules.

15. (a) Compare Genetic Algorithm and Traditional Algorithm.

Or

- (b) Write any five operators in Genetic Algorithm.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)  
Each answer should not exceed 600 words.

16. (a) Write about various terminology of ANN in detail.

Or

- (b) Explain the Training and Learning of ANN.

17. (a) Analyze Adaline network Training and Testing Algorithm.

Or

- (b) Illustrate Boltzmann Machine.

18. (a) Explain the Properties of Fuzzy set.

Or

- (b) Define Defuzzification. And State the necessity of defuzzification method.

19. (a) Summarize the four structure of Fuzzy production rule system.

Or

- (b) Illustrate the methods of Fuzzy Inference System (FIS).

20. (a) What are the basic terminologies in Genetic Algorithm? Explain.

Or

- (b) Write about the classification of Genetic algorithm.

Reg. No. : .....

Code No. : 5475

Sub. Code : ZCSM 34

M.Sc. (CBCS) DEGREE EXAMINATION,  
APRIL 2023

Third Semester

Computer Science – Core

RESEARCH METHODOLOGY

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. \_\_\_\_\_ research uses facts or information already available.  
(a) Conceptual                      (b) Empirical  
(c) Descriptive                      (d) Analytical
2. Which of the following is not a quality of good research?  
(a) randomized                      (b) logical  
(c) replicable                      (d) empirical

3. Which research does not aim at testing the hypothesis?
  - (a) Confounded
  - (b) formulative
  - (c) Relational
  - (d) Conceptual
4. Which involves seeking new patterns with the observations and make it as a theory?
  - (a) Prediction
  - (b) Explanation
  - (c) Induction
  - (d) Deduction
5. Which allows for the investigation of the main and interaction effects?
  - (a) Factor Design
  - (b) CRD
  - (c) RBD
  - (d) LSD
6. Which type of report is a document written by a researcher detailing the results of a project?
  - (a) technical
  - (b) popular
  - (c) Research
  - (d) Press
7. Which of the following is the percentage of gross or net revenue derived from the use of an asset?
  - (a) Patent
  - (b) Royalty
  - (c) Plagiarism
  - (d) Copyright
8. Data Analysis is \_\_\_\_\_
  - (a) Copyright
  - (b) Ethical Issue
  - (c) Research Ethics
  - (d) Information security

9. The classroom interaction between teacher and students is \_\_\_\_\_ phase
  - (a) pre - active
  - (b) pro - active
  - (c) inter - active
  - (d) post - active
10. Which of the following is not an effective way for presentation?
  - (a) not relying on technology
  - (b) Use visuals wisely
  - (c) not considering audience
  - (d) Plan the presentation

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Define Research. Express the motivation and objectives of research.  
Or  
(b) List the importance of literature review.
12. (a) Summarize Laws and theories in Research.  
Or  
(b) Discuss about Sample design.
13. (a) Explain theory of estimation.  
Or  
(b) Interpret CRD Analysis.
14. (a) List the application of result and ethics.  
Or  
(b) Give the trade related aspects of Intellectual Property Rights.



15. (a) State the phrases of teaching.

Or

(b) Describe the ways of teaching later adolescent.

PART C — (5× 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Give the necessity of defining research and formulating research problem.

Or

(b) Discuss about the review of literature.

17. (a) Develop a Research plan.

Or

(b) Explain the different methods of data collection.

18. (a) State the principles of hypothesis and testing.

Or

(b) Compare the different types of report.

19. (a) Discuss about ethical issues.

Or

(b) Explain reproducibility and accountability.

20. (a) Explain objectives and methods of teaching.

Or

(b) Describe Evaluation.

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