Seat No.	

Set P

M.Sc. (Computer Science) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Objects Oriented Programming using C++ (2318101)

Day & Date: Thursday, 15-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.

Q.1 A) Choose correct alternative. **08**

1) Which of the following is the correct syntax to add the header file in the C++ program?
a) #include<user defined>
b) #include "userdefined.h"
c) <include> "userdefined.h"
d) Both a and b

2) Which of the following is the correct identifier?
a) $var_name b) VAR_123
c) varname@ d) None of the above

3) Which of the following is the address operator?
a) @ b) #
c) & d) %

4) Which of the following features must be supported by any programming language to become a pure object-oriented programming language?
a) Encapsulation b) Inheritance
c) Polymorphism d) All of the above

5) The programming language that has the ability to create new data types is called _____.
a) Overloaded b) Encapsulated
c) Reprehensible d) Extensible

6) Which of the following is the original creator of the C++ language?
a) Dennis Ritchie b) Ken Thompson
c) Bjarne Stroustrup d) Brian Kernighan

7) Which of the following is the correct syntax to read the single character to console in the C++ language?
a) Read ch() b) Getline vh()
c) get(ch) d) Scanf(ch)

8) Which of the following statements is correct about the formal parameters in C++?

a) Parameters with which functions are called
b) Parameters which are used in the definition of the function
c) Variables other than passed parameters in a function
d) Variables that are never used in the function

B) Write True/False. **04**

1) Sub classes may also be called Child classes/Derived classes.
2) It is not possible to achieve inheritance of structures in c++?
3) Super classes are also called Parent classes/Base classes.
4) There are only two possible values for the bool data type.

Q.2 Answer the following question. (Any Six) **12**

a) What is Polymorphism and encapsulation?
b) How can you mean by exception whenever the input number is less than zero?
c) What is array of structure?
d) Differentiate between structure and union
e) What do you mean by a token?
f) Define late binding.
g) Define destructor.
h) Define Data members.

Q.3 Answer the following question. (Any Three) **12**

a) Explain Inline function with example.
b) What do you mean by operator precedence?
c) Explain passing object as function parameter with example.
d) Write a program display given number is Armstrong or not using friend function

Q.4 Answer the following question (Any Two) **12**

a) What are the features of Object-oriented programming.
b) Explain use of friend function with the help of suitable example.
c) Explain pure virtual function with example.

Q.5 Answer the following question (Any Two) **12**

a) Explain bitwise operators with example.
b) What is an array? Explain types of arrays with example. What are the advantages and disadvantages of using array?
c) Write a C++ program to overload area () function to calculate area of Shapes like triangle, square, circle.

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Set P

M.Sc. (Computer Science) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Advanced DBMS (2318102)

Day & Date: Saturday, 17-May-2025 Max. Marks:60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **08**

1) _____ refers to the requirement that other operations cannot access or see the data in an intermediate state during a transaction.
   a) Atomicity b) Consistency
   c) Isolation d) Durability

2) Which one of the following refers to the “data about data”.
   a) Metadata b) Subset
   c) Warehouse d) Directory

3) If a transaction does not modify the database until it has committed, it is said to use the _____ technique.
   a) Undo b) Deferred Modification
   c) Late Modification d) Immediate Modification

4) _____ is not a function of the database.
   a) Managing Stored Data b) Manipulating Data
   c) Security for stored data d) Analyzing code

5) _____ command is used to remove the trigger from database.
   a) Remove trigger b) Drop trigger
   c) Delete trigger d) Rollback trigger

6) A transaction complete its execution is said to be _____.
   a) Rollback b) Aborted
   c) Committed d) Failed

7) Checkpoint is a part of _____.
   a) Security Measures b) Recovery Measures
   c) Concurrency Measures d) Authorization Measures

8) _____ is used to denote the selection operation in relational algebra.
   a) Pi b) Sigma
   c) Lambda d) Omega

B) Write true or false. **04**

1) Atomicity ensures that all operations within the work unit are completed successfully.
2) In a database, data is stored in spreadsheets which have rows and columns.
3) Fifth Normal form is concerned with Join dependency.
4) Specialization is bottom up process.

Q.2 Answer the following. (Any Six) **12**

a) Define transaction.
b) Define tuple and domain.
c) What is view?
d) Define Specialization.
e) Why use primary key?
f) Define DDL and DML.
g) List database users.
h) What is shadow paging?

Q.3 Answer the following. (Any Three) **12**

a) What are the advantages of DBMS?
b) What is cursor? Explain with example.
c) Explain order by clause and group by clause with example.
d) Explain two phase locking protocol in details.

Q.4 Answer the following. (Any Two) **12**

a) What is join? Explain types of join with example.
b) Explain types of data model.
c) What is relational algebra? Explain select and project operation with example.

Q.5 Answer the following. (Any Two) **12**

a) What is trigger? Explain types of trigger with example.
b) What is database recovery? Explain log based recovery in details.
c) What is normalization? Explain INF, 2NF and 3NF?

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Set **P**

M.Sc. (Computer Science) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Data Structures and Algorithms (2318107)

Day & Date: Monday, 19-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **08**

1) _____ lists make reverse traversal as simple as forward traversal.
a) Priority b) Singly
c) Doubly d) One Ended

2) The structure allows variables to name data of that and _____ provides a set of operations which meaningfully manipulates these variables.
a) Structures b) Constants
c) Library d) Type

3) In a matrix, if there are only 4 non-zero elements out of 40 elements and that is _____.
a) Empty Dense b) NULL
c) Sparse d) Empty

4) A Stack is an _____ list in which all insertions and deletions are made at one end.
a) unordered b) ordered
c) linked d) random

5) A Queue is an ordered list in which all insertions take place at one end called _____.
a) End b) Rear
c) Front d) Top

6) In tree, _____ of the same parent are called siblings.
a) Parent of Parent b) Leaf
c) Terminal d) Children

7) In _____ tree, any node can have at most two branches.
a) Unary b) Depth First
c) Breadth First d) Binary

8) Sorting algorithm is used to rearrange a given array or list of elements in an _____.
   a) Merged form b) Unsorted form
   c) Ordered form d) Searched form

B) Write True or False. **04**

1) Queue in linear data structure.
2) Linked list is needed to convert infix notation to postfix notation.
3) Backtracking step is used in Depth First Tree Traversal.
4) Stack data structure uses non recursive implementation of a recursive algorithm.

Q.2 Answer the following. (Any Six) **12**

a) What is Algorithm?
b) Define Tree.
c) What is LIFO?
d) What do you mean by Linked List?
e) Define Search.
f) What is Matrix?
g) What do you mean by Data?
h) What is Sorting?

Q.3 Answer the following. (Any Three) **12**

a) What is Breadth First Search?
b) Define Double Ended Queue.
c) State and explain in brief Push, Pop operation with Top of Stack status.
d) State and explain in brief Circular Linked List.

Q.4 Answer the following. (Any Two) **12**

a) Explain evaluating Postfix expression using Stack for the given expression-

2	12	24	+	*	9	-	3	+

b) Discuss and apply Merge Sort to state result of it on below given series-
Series - 4, 9, 105, 74, 10, 85, 71, 101, 876, 143, 39, 571, 24

c) State and explain Binary tree characteristics and various types of binary tree with suitable example.

Q.5 Answer the following. (Any Two) **12**

a) Generate Binary Search Tree of given series and state the pre-order, in-order and post-order traversing results of it.
Series- 85, 55, 75, 19, 3, 5, 20, 1, 26, 21, 95, 17, 13, 6, 5

b) State and explain in detail procedure to insert element at beginning, middle and end of Doubly Linked List with suitable example.

c) Discuss various types of Queue and related Operations with suitable example.

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Set P

M.Sc. (Computer Science) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Operating System (2318108)

Day & Date: Monday, 19-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose the correct alternatives. **08**

1) Thrashing occurs when ____.
a) A process is in waiting state
b) CPU is idle for a long time
c) Pages are swapped in and out frequently
d) RAM is too large

2) A system call is used to ____.
a) Execute system programs
b) Request service from the kernel
c) Link libraries
d) Compile code

3) Logical address is generated by ____.
a) MMU b) CPU
c) Compiler d) Disk controller

4) Which of the following is not a page replacement algorithm?
a) FIFO b) LRU
c) Optimal d) Multilevel

5) Which memory allocation technique may lead to external fragmentation?
a) Paging b) Segmentation
c) Contiguous allocation d) Swapping

6) Which of these is a synchronization tool?
a) Timer b) Semaphore
c) Deadlock d) Paging

7) The method to recover from deadlock includes ____.
a) Avoidance b) Preemption
c) Rollback d) All of the above

8) What is the function of the Linux loader (LILO)?
a) Load GUI b) Format disk
c) Load Linux kernel d) Authenticate user

B) Write True/False: **04**

a) The Banker's algorithm is used to prevent deadlock in operating systems.
b) Multilevel feedback queue allows processes to move between queues.
c) Deadlocks can never be prevented in a system.
d) The Linux file system follows a tree-like hierarchical structure.

Q.2 Answer the following: (Any Six) **12**

a) Define multiprogramming. How does it improve CPU utilization?
b) Give the any two function of kernel in an operating system.
c) Give the advantages of threads in OS.
d) Define paging. How is logical address mapped to physical address?
e) What is a file system? Mention any two file allocation methods.
f) What is virtual memory? Give its role in an operating system.
g) What is a system call?
h) Define semaphore. Why is it used?

Q.3 Answer the following: (Any Three) **12**

a) Explain First-Come-First-Serve (FCFS) and Shortest Job First (SJE) scheduling.
b) What is swapping in memory management? Discuss its advantages and disadvantages.
c) Explain deadlock prevention technique.
d) Differentiate between paging and segmentation in memory management.

Q.4 Answer the following (Any Two). **12**

a) What is CPU scheduling? Compare priority and round robin scheduling algorithms.
b) Describe critical section problem and its solutions.
c) What is process? Explain the process state transition diagram.

Q.5 Answer the following (Any Two). **12**

a) Explain file allocation methods in detail.
b) Explain Linux file permissions. How can they be changed using the chmod, chown, and chgrp commands.
c) Define disk scheduling. Explain any three disk scheduling algorithms with examples.

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Set P

M.Sc. (Computer Science) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Research Methodology in Computer Science (2318103)

Day & Date: Saturday, 24-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **08**

1) Research is related with: _____.
a) Discovery of new idea b) Solution of a problem
c) Investigation of a problem d) All of these

2) A _____, in general, refers to some difficulty which a researcher experiences in the context of either a theoretical or practical situation and want to obtain a solution for same.
a) synopsis b) literature review
c) research problem d) abstract

3) Good research is _____: It means that research is structured with specified steps to be taken in a specified sequence in accordance with the well-defined set of rules.
a) systematic b) logical
c) empirical d) replicable

4) A _____ is defined as a publication issued in successive part, usually at regular intervals, and as a rule, intended to be continued indefinitely.
a) conference b) periodical
c) book d) research paper

5) The major purpose of _____ research is description of the state of affairs as it exists at present.
a) applied b) analytical
c) descriptive d) fundamental

6) Good research is _____ : It implies that research is related basically to one or more aspects of a real situation and deals with concrete data that provides a basis for external validity to research results.
a) systematic b) logical
c) replicable d) empirical

7) The search for knowledge through objective and systematic method of finding solution to a problem is _____.

a) research b) search
c) knowledge d) none of these

8) _____ research is specially important in the behavioural sciences where the aim is to discover the underlying motives of human behaviour.

a) Fundamental b) Qualitative
c) Quantitative d) Applied

B) Write true or false **04**

1) Too narrow or too vague problems should be considered for research.
2) The best way of understanding the problem is to discuss it with one's colleagues or with those having some expertise in the matter.
3) The main aim of research is to find out the truth which is hidden and which has not been discovered as yet.
4) Encyclopaedia provide concise information on a number of subjects written by specialists.

Q.2 Answer the following. (Any Six) **12**

a) What is synopsis?
b) State and explain any two criteria for good research.
c) Define Research.
d) What do you mean by e-research?
e) What is Abstract?
f) Explain in short the example of Quantitative research.
g) What is the need of sections/subsections in report?
h) What do you mean by keywords?

Q.3 Answer the following. (Any Three) **12**

a) Write a short note on Virtual lab.
b) What are the general rules of research report writing? Explain it.
c) Explain IEEE format of writing the research paper.
d) Explain ethical issues in research.

Q.4 Answer the following. (Any Two) **12**

a) What is Literature Review? Explain its importance with example.
b) What is research design? Explain the features of good research design.
c) Explain the necessities of defining the problem.

Q.5 Answer the following. (Any Two) **12**

a) What is research? Explain the motivation in research.
b) Explain descriptive vs. Analytical research with example.
c) Explain different steps involved in Research Process.

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Set P

M.Sc. (Computer Science) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
Java Programming (2318201)

Day & Date: Wednesday, 14-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **08**

1) What is the default value of a Boolean variable?
   a) true b) false
   c) null d) 0

2) What is the correct syntax for a Java main method?
   a) public static int main(String args[])
   b) public static void main(String args[])
   c) static public void main(String args[])
   d) Both b and c

3) Which Java feature allows the use of the same method name with different arguments?
   a) Inheritance b) Polymorphism
   c) Overloading d) Overriding

4) Which of these is used to create a package?
   a) include b) import
   c) package d) create

5) What is returned by the length () method of the String class?
   a) Number of characters in the string
   b) Number of words in the string
   c) Index of the last character in the string
   d) None of the above

6) Which method is used to convert an array into a list?
   a) Arrays.toList() b) List.fromArray()
   c) Arrays.asList() d) None of the above

7) In Java, which access modifier allows visibility within the same package?
   a) public b) private
   c) default d) protected

8) Which method is used to suspend a thread?
   a) stop() b) pause()
   c) wait() d) sleep()

B) Write True or False. **04**

1) The do-while loop executes at least once, even if the condition is false.
2) Java does not support multiple inheritance directly using classes.
3) The Runnable interface contains the run() method.
4) In Java, a String is mutable.

Q.2 Answer the following. (Any Six) **12**

a) What is the difference between a break and a continue statement?
b) Explain the concept of final classes.
c) How does the switch statement work?
d) What are wrapper classes? Explain with examples.
e) Describe the use of access modifiers.
f) Explain the difference between overloading and overriding.
g) How are sockets used in Networking?
h) Describe the steps to create a thread using the Runnable interface.

Q.3 Answer the following. (Any Three) **12**

a) Write a program to demonstrate the use of a labeled loop.
b) Explain the exception hierarchy.
c) Discuss the significance of the InetAddress class in Networking.
d) Explain the role of abstract classes and how they differ from interfaces.

Q.4 Answer the following. (Any Two) **12**

a) Write a program to handle file input/output.
b) Discuss the role of layout managers in AWT with examples.
c) Explain event listeners with an example of button handling.

Q.5 Answer the following. (Any Two) **12**

a) Write a program to demonstrate multilevel inheritance.
b) Explain the JDBC architecture and write a sample program to execute an SQL query.
c) Discuss the different methods of inter-thread communication.

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Set **P**

M.Sc. (Computer Science) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
Python Programming (2318202)

Day & Date: Friday, 16-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **08**

1) Which widget are used to get the data from the user?
   a) Entry b) Label
   c) Button d) None of the above

2) How does run() method is invoked?
   a) Thread.run() b) Thread.start()
   c) Thread.create() d) Thread.join()

3) Django is a Python-based _____.
   a) web framework b) video creating tool
   c) analysis tool d) desktop development platform

4) Config() in python Tkinter are used for?
   a) Place the widget b) Destroy the widget
   c) Configure the widget d) Change the property of the widget

5) Which of the following input can be accepted by DataFrame?
   a) Structured ndarray b) Series
   c) DataFrame d) All of the mentioned

6) To read two characters from a file object infile, we use _____.
   a) infile.read(2) b) infile.read()
   c) infile.readline() d) infile.readlines()

7) How do you define an abstract class in Python?
   a) By using the abstract keyword
   b) By using the abstract class statement
   c) By importing the abc module and using @abstractmethod decorator
   d) By using the virtual keyword

8) NumPy arrays can be _____.
   a) lndexed b) Sliced
   c) lterated d) All of the mentioned above

B) Fill in the blank. **04**

1) The full form, of MVC is _____.
2) _____ model is import for numpy programming.
3) The list is _____.
4) _____ module in Python supports regular expressions.

Q.2 Answer the following. (Any Six) **12**

a) What is class and object?
b) What is Canvas?
c) What is dictionary? Give an example.
d) What is constructor? List out types of constructor.
e) What is scatter plot?
f) What is anonymous function?
g) What is exception handling?
h) What is pandas? Give an example.

Q.3 Answer the following. (Any Three) **12**

a) Explain the types of decorators with example.
b) Write a simple program to read the content from one file and write into another file.
c) What is method overloading and overriding?
d) What is thread synchronization? Explain with example.

Q.4 Answer the following. (Any Two) **12**

a) What is tuple? Explain methods of tuple.
b) What is numpy? Explain the indexing and slicing with example.
c) What is regular expression? Explain in detail.

Q.5 Answer the following. (Any Two) **12**

a) Explain Dijango web frame work.
b) Write a python application to insert and display employee details like emp_id,emp_name,salary,company_name, address using Myb SQL database.
c) Explain the Universal function of DataFrame.

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Set P

M.Sc. (Computer Science) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
Computer Communication Network (2318207)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. 08

1) Which of the following is true about UDP (User Datagram Protocol)?
   a) It guarantees delivery and ensures data integrity.
   b) It is a connectionless protocol.
   c) It is used for establishing sessions between devices.
   d) It ensures that all data is transmitted in sequence.

2) Which of the following protocols operates at the Application Layer?
   a) TCP b) IP
   c) HTTP d) Ethernet

3) The MAC (Media Access Control) address is associated with which OSI layer?
   a) Physical Layer b) Data Link Layer
   c) Network Layer d) Transport Layer

4) Which of the following is NOT a responsibility of the Network Layer?
   a) Routing packets between devices
   b) Logical addressing
   c) Error detection and correction
   d) Fragmentation and reassembly of packets

5) Which of the following is a key difference between TCP and UDP?
   a) TCP is faster because it doesn't check for errors.
   b) TCP provides reliability through acknowledgment, while UDP does not.
   c) UDP uses a three-way handshake to establish connections, whereas TCP does not.
   d) UDP guarantees in-order delivery of packets, while TCP does not.

6) The main purpose of the DNS protocol is to: _____.
   a) Manage network addresses
   b) Provide a translation between domain names and TP addresses
   c) Transfer files across a network
   d) Establish peer-to-peer connections

7) In the OSI model, the Data Link Layer is responsible for: _____.
   a) Routing data between different networks
   b) Error detection and correction, and framing of data
   c) Ensuring end-to-end communication
   d) Providing logical addressing of devices

8) What is the main purpose of the Physical Layer in the OSI model?
   a) Error detection
   b) Routing packets
   c) Transmission of raw bit streams
   d) Encryption of data

B) Fill in the blank/Definition/One sentence answer/ One word answer/ Give the name/Predict the product etc. **04**

1) _____ is a system used for converting domain names (like www.example.com) into IP.
2) The process of dividing data into smaller packets for transmission over a network is called _____.
3) The _____ layer of the OSI model ensures reliable data transmission between devices by managing error detection, flow control, and retransmission.
4) _____ is a protocol used for transferring files between computers over a network.

Q.2 Answer the following. (Any Six) **12**

a) What is difference between an active hub and passive hub?
b) What are the responsibility of Data Link Layer?
c) What is the key idea of stop and wait protocol?
d) Write the type of frame field contained in HDLC?
e) What is the hamming distance between the code ‘11001011’ and ‘ 10000111’
f) What is congestion control?
g) What are the characteristics of network?
h) Assume 6 devices are arranged in mesh topology .How many cables and ports are needed?

Q.3 Answer the following. (Any Three) **12**

a) What are the types of switching? Explain in detail.
b) Explain briefly the mechanism for unicast, broadcast and multicast routing.
c) Explain the different Congestion control algorithm.
d) Find the CRC for 1110010101 with the devisor X^3+X^2+1.

Q.4 Answer the following. (Any Two) **12**

a) Explain different sliding window protocols in Data link layer.

b) For the given IP Address 192.168.10.0 / 25
Find the following.
1. Subnet Mask
2. Number of host in each network
3. Number of IP address in each network
4. Number of networks

c) Explain the concept of WWW.

Q.5 Answer the following. (Any Two) **12**

a) Explain in detail about Congestion control techniques in transport layer.

b) Explain the MULTIPLE ACCESS PROTOCOLS in detail.

c) We have a network of four routers: A, B, C, and D, with the following connections and costs:
- $A \leftrightarrow B: Cost = 1$
- $A \leftrightarrow C: Cost = 3$
- $B \leftrightarrow C: Cost = 1$
- $B \leftrightarrow D: Cost = 2$
- $C \leftrightarrow D: Cost = 5$

Find shortest path table.

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M.Sc. (Computer Science) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
Mobile Computing (2318208)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **08**

1) Bluetooth supports _____.
   a) point-to-point connections
   b) point-to-multipoint connection
   c) both point-to-point connections and point-to-multipoint connection
   d) multipoint to point connection

2) Bluetooth is the wireless technology for _____.
   a) local area network
   b) personal area network
   c) metropolitan area network
   d) wide area network

3) Which of the following is not an application of third generation network?
   a) Global Positioning System (GPS)
   b) Video conferencing
   c) Mobile TV
   d) Downloading rate upto 1 Gbps

4) What is the term used by ITU for a set of global standards of 3G systems?
   a) IMT 2000 b) GSM
   c) CDMA d) EDGE

5) Which of the following WAP protocol stack is an adaption type of layer?
   a) WAE b) WSP
   c) WTP d) WDP

6) What is Mobile communication?
   a) Allows to communicate from different locations without the use of physical medium
   b) Allows to communicate from different locations with the use of physical medium
   c) Allows to communicate from same locations without the use of physical medium
   d) Allows to communicate from same locations with the use of physical medium

7) The IMT-2000 is a digital Mobile network that functions as the _____.
   a) Cordless b) Pager
   c) Lower earth orbit satellite d) All of the above

8) The term "HLR" stands for the _____.
   a) Home Location Register b) House Location Register
   c) Home Live Register d) None of the above

B) Write true or false. **04**

1) Mobility management function handles the function that arises due to mobility of the subscriber.
2) The mobile equipment has a unique international mobile equipment identity (IMEI).
3) GPRS supports a class of network nodes to offer packet data.
4) Power Management function to control transmitter activity for power conservation with missing a frame.

Q.2 Answer the following. (Any Six) **12**

a) What the different layers in GSM Architecture?
b) Write Advantages of Wireless LAN.
c) Define Piconet.
d) What is Roaming?
e) What is WML?
f) Define Virtual Private Network.
g) What is the use of HLR.
h) Define Handoff.

Q.3 Answer the following. (Any Three) **12**

a) Write Note on Mobility Management.
b) Explain Mobile IP.
c) Write a short Note on WAP.
d) Write short Note on IMT 2000 (3G) Mobile Services.

Q.4 Answer the following. (Any Two) **12**

a) Draw and explain the GPRS architecture.
b) Explain GSM Call Origination Operation.
c) Explain the architecture of Infrastructure based Wireless LAN IEEE standard 802.11

Q.5 Answer the following. (Any Two) **12**

a) Explain the quality of Services (QoS) in 3G.

b) What is Global Mobile Satellite Systems? Write its Applications.

c) Explain the Case Study of the GLOBALSTAR.

Seat No.	

Set **P**

M.Sc. (Computer Science) (Sem - III) (New) (NEP CBCS) Examination: March/April - 2025
Digital Image Processing (2318301)

Day & Date: Thursday, 15-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of scientific calculator is allowed.

Q.1 A) Choose correct alternative. **08**

1) Gamma correction is mostly used in _____.
a) CRT b) Audio
c) Radio d) Music

2) DFT stands for _____.
a) Digital Fourier Transform
b) Discrete Fourier Table
c) Discrete Fourier Transform
d) Digital Fourier Table

3) The Hit-or-Miss transformation is defined in terms of _____ structuring elements.
a) zero b) one
c) two d) none of these

4) A filter in which the filtering is applied separately for illumination and reflectance component is _____filtering.
a) frequency domain b) spatial domain
c) homomorphic d) lowpass

5) An 8-bit RGB color image having size 16X64 needs _____ kBytes of storage.
a) 3 b) 24
c) 1024 d) 2072

6) The second order derivative of image sharpening called as _____.
a) Gaussian b) Laplacian
c) Canny d) Euclid

7) Fisher in 1936 proposed _____ problem.
a) recognition b) identification
c) classification d) description

8) Which of the following is not alternative word used for pixels?

a) Image elements b) Pils
c) Picture elements d) None of the above

B) Fill in the blank. **04**

1) In image restoration, _____ filtering can be used to reduce the effect of noise. This involves using a small filter that operates on local neighborhoods of the image.
2) Closing is the sequence of _____ followed by _____.
3) Image Segmentation: Dividing an image into regions based on _____ or _____.
4) A _____ filter is used to reduce noise in an image by averaging the pixel values of neighboring pixels.

Q.2 Answer the following. (Any Six) **12**

a) What is histogram equalization?
b) Define Fourier Transform (FT).
c) What is the difference between dilation and erosion in image processing?
d) What is image segmentation?
e) What is a boundary descriptor in image processing?
f) What is the difference between image sampling and quantization?
g) What are common noise models used in image processing?
h) What is spatial filtering in image enhancement?

Q.3 Answer the following. (Any Three) **12**

a) Gaussian noise, salt-and-pepper noise
b) Regional descriptor
c) Contrast stretching
d) Butterworth Filter

Q.4 Answer the following. (Any Two) **12**

a) What are the components of digital image processing system?
b) Explain histogram processing.
c) What are the three types of lowpass filters? Explain Ideal lowpass filter.

Q.5 Answer the following. (Any Two) **12**

a) Explain the Hit-or-Miss transformation.
b) Threshold following image using global thresholding algorithm.

19	122	165	138	211
187	195	133	199	89
114	142	93	178	209
134	149	163	190	210
60	169	188	205	177

Select initial threshold as 115 and stop algorithm when difference of threshold is less than 0.1.

c) What is Adjacency and connectivity? Explain different types of Adjacencies and connectivity in detail.

Seat No.	

Set | P

M.Sc. (Computer Science) (Sem - III) (New) (NEP CBCS) Examination: March/April - 2025
Data Warehousing and Data Mining (2318302)

Day & Date: Saturday, 17-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **08**

1) The full form of OLAP is _____.
   a) Online Analytical Processing
   b) Online Advanced Processing
   c) Online Advanced Preparation
   d) Online Advanced Performance

2) An _____ system manages current data.
   a) OLAP b) OLTP
   c) OLEP d) none of these

3) _____ in which the data warehouse contains a large central table and a set of smaller attendant tables, one for each dimension.
   a) Snowflake schema b) Star schema
   c) Fact constellation schema d) Hybrid schema

4) The _____ operation performs aggregation on a data cube, either by climbing up a concept hierarchy for a dimension or by dimension reduction.
   a) roll-up b) drill-down
   c) drill-rotate d) rule-up

5) The _____ operation performs a selection on one dimension of the given cube, resulting in a subcube.
   a) dice b) drill-down
   c) roll-up d) slice

6) A _____ is a set of views over operational databases.
   a) Enterprise warehouse b) Data Mart
   c) Virtual warehouse d) Refresh

7) _____, which detects errors in the data and rectifies them when possible.
   a) Refresh Data b) Data Transformation
   c) Data Cleaning d) Data Extraction

8) _____ include concept description, association, classification, prediction and clustering.
   a) Task Relevant data b) Kinds of Knowledge
   c) Background Knowledge d) Interestingness measure

B) Write true or false. **04**

1) Drill down navigates from less detailed data to more detailed data.
2) An OLTP system focuses mainly on the current data within an enterprise or department.
3) Data cleaning, which typically gathers data from multiple, heterogeneous and external sources.
4) Fact constellation schema is also called as galaxy schema.

Q.2 Answer the following. (Any Six) **12**

a) What is Enterprise warehouse?
b) What is mean by front end tool?
c) What is gain index?
d) What is Data cleaning?
e) What do you mean by meta data repository?
f) What is data Transformation?
g) What do you mean by refresh the data?
h) Write an example of categorical type of data.

Q.3 Answer the following. (Any Three) **12**

a) What is Data Cleaning? Explain use of binning technique with example.
b) Explain the use of set-grouping hierarchies with suitable example
c) Explain various issues regarding with classifications.
d) What is unsupervised learning? Explain with example.

Q.4 Answer the following. (Any Two) **12**

a) Explain Apriori algorithm with example.
b) What is Data warehouse? Explain the difference between OLAP and OLTP.
c) Explain the different types of hierarchical clustering methods.

Q.5 Answer the following. (Any Two) **12**

a) Explain three tier architecture of data warehouse with well labelled diagram.
b) What is data mining? Explain applications of data mining.
c) Explain the decision tree induction method with example.

Seat No.	

Set **P**

M.Sc. (Computer Science) (Sem - III) (New) (NEP CBCS) Examination: March/April - 2025
Open Source Technologies (PHP, MySql) (2318306)

Day & Date: Monday, 19-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **08**

1) What is PHP?
   a) PHP is an open-source programming language
   b) PHP is used to develop dynamic and interactive websites
   c) PHP is a server-side scripting language
   d) All of the mentioned

2) Which is the right way of declaring a variable in PHP?
   a) $3hello b) $_hello
   c) $this d) $5_Hello

3) What does fopen() function do in PHP?
   a) It used to open files in PHP
   b) It used to open Remote Server
   c) It used to open folders in PHP
   d) It used to open Remote Computer

4) PHP Stands for _____.
   a) Php Hypertext Processor
   b) Php Hypertext Preprocessor
   c) Php Hypermarkup Preprocessor
   d) Php Hypermarkup Processor

5) Which one of the following methods is responsible for sending the query to the database?
   a) query () b) send_query()
   c) send query() d) mysqli_query

6) Which function is used to erase all session variables stored in the current session?
   a) session_destroy() b) session__change()
   c) session_remove() d) session_unset()

7) Which of the following is not a variable scope in PHP?
   a) Extern b) Local
   c) Static d) Global

8) Which of the following PHP function will return true if a variable is an array or false if it is not an array?
   a) this_array() b) is_array()
   c) do_array() d) in_array()

B) Fill in the blanks. **04**

1) _____ operator is used for concatenation in PHP.
2) The _____ method returns the error code generated from the execution of the last MySQL function.
3) The _____ function is used to set session in the PHP.
4) By using _____ we prevent a method from being overridden by a subclass.

Q.2 Answer the following. (Any Six) **12**

a) What Session? Given an example.
b) What is the use of GET method?
c) What are the advantages of PHP?
d) What is associative array?
e) What is constructor used in PHP?
f) What is str_replace(), strcmp()?
g) What is Dynamic Websites?
h) List out any four string functions.

Q.3 Answer the following. (Any Three) **12**

a) What is session and cookie? Explain how to read and write cookies with example.
b) Write A PHP script to check given number is prime or not.
c) Write a PHP script to select and insert records using stored procedure.
d) Write PHP script to display indexed array in reverse order.

Q.4 Answer the following. (Any Two) **12**

a) Write the PHP code for fetching the data from a database to a webpage.
b) What are different ways to fetch result from query result? Give example.
c) Write PHP script to sending and receiving email.

Q.5 Answer the following. (Any Two) **12**

a) Explain the looping statements used in PHP with example.
b) Explain the any 6 string functions used in PHP with example.
c) Explain the client-side and server-side scripting with example.

SLR-ZG-14

Seat No.	

Set P

M.Sc. (Computer Science) (Sem - III) (New) (NEP CBCS) Examination: March/April - 2025
Artificial Intelligence (2318307)

Day & Date: Monday, 19-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **08**

1) _____ is the first operator applied to the population.
   a) Reproduction b) Recombination
   c) Mutation d) None of the above

2) _____ is the well-known Expert System for medical diagnosis systems.
   a) MYSIN b) CADUCEUS
   c) DENDRAL d) SMH.PAL

3) A Neural Network can answer _____.
   a) for loop questions
   b) what-if questions
   c) IF-The-Else Analysis Questions
   d) None of the above

4) In language understanding, what are the levels of knowledge that are not included?
   a) Phonological b) Syntactic
   c) Empirical d) Logical

5) People overcome natural language problems by _____.
   a) grouping attributes into frames
   b) understanding ideas in context
   c) identifying with familiar situations
   d) both understanding ideas in context & identifying with familiar situations

6) Supervised Learning is _____.
   a) learning with the help of examples
   b) learning without a teacher
   c) learning with the help of the teacher
   d) learning with computers as a supervisor

7) The conversion of a fuzzy set to a single crisp value is called _____.
   a) fuzzification b) defuzzification
   c) fuzzy logic d) fuzzy rule

8) The formula which has all its interpretations recording true is known as a _____.
   a) disjunction b) conjunction
   c) tautology d) antecedent

B) Fill in the blank. **04**

1) _____ chaining algorithm is known as goal driven algorithm and it is used to solve a problem.
2) External actions of the agent are selected by _____.
3) _____ in Artificial Intelligence are derived from semantic nets.
4) A neuron can send _____ signal at a time.

Q.2 Answer the following. (Any Six) **12**

a) List the criteria to measure the performance of search strategies.
b) What is Markov's Decision process?
c) Define Semantic Net.
d) What are the issues in knowledge representation?
e) Why there is a need for predicate logic?
f) What are the advantages of depth-first search?
g) What is backtracking?
h) What is the difference between local maxima and plateaus?

Q.3 Answer the following. (Any Three) **12**

a) Differentiate between top-down versus bottom-up Parsing.
b) Discuss the characteristics of a production system.
c) Explain ISA relation with a suitable example.
d) Explain the minimax search procedure with a suitable example.

Q.4 Answer the following. (Any Two) **12**

a) Explain the decision tree with an example.
b) Explain the constraint satisfaction problem in Al to solve SEND + MORE = MONEY.
c) Define Expert System. Explain in detail the process of knowledge acquisition.

Q.5 Answer the following. (Any Two) **12**

a) Explain CBR in detail.
b) What is machine learning? Explain types of machine learning.
c) Explain the resolution with an example.

Seat No.	

Set P

M.Sc. (Computer Science) (Sem - III) (New) (NEP CBCS) Examination: March/April - 2025
Cloud Computing (2318308)

Day & Date: Monday, 19-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **08**

1) Which of the following is a type of cloud computing service?
   a) Service-as-a-Software (SaaS)
   b) Software-and-a-Server (SaaS)
   c) Software-as-a-Service (SaaS)
   d) Software-as-a-Server (SaaS)

2) Which architectural layer is used as a backend in cloud computing?
   a) Cloud b) Soft
   c) Client d) Machine

3) Which of the following is not a property of cloud computing?
   a) Virtualization
   b) Compensability
   c) Scalability
   d) all of the mentioned
   e) KaaS

4) _____ as a Service is a cloud computing infrastructure that creates a development environment upon which applications may be build.
   a) Infrastructure b) Service
   c) Platform d) All of the mentioned

5) Which of the following is the fundamental unit of virtualized client in an IaaS deployment?
   a) Workunit b) Workspace
   c) Workload d) All of the mentioned

6) Which of the following is a SaaS characteristic?
   a) The typical license is subscription-based or usage-based and is billed on a recurring basis
   b) The software is available over the Internet globally through a browser on demand
   c) The software and the service are monitored and maintained by the vendor
   d) All of the mentioned

7) Applications such as a Web server or database server that can run on a virtual machine image are referred to as_____.
   a) virtual server b) virtual appliances
   c) machine imaging d) all of the mentioned

8) Which of the following provides development frameworks and control structures?
   a) IaaS b) SaaS
   c) PaaS d) All of the mentioned

B) Write True /False. **04**

1) The impact of cloud computing on network communication is to discourage the use of open source network protocols in place of proprietary protocol.
2) With a pay-as-you-go, endlessly expandable, and universally available system, cloud computing realises the long-held goal of utility computing.
3) The widespread use of the Internet enables the huge size of cloud computing systems.
4) Nearly all major virtualization platform vendors support OVF, notably VMware, Microsoft, Oracle, and Citrix.

Q.2 Answer the following. (Any Six) **12**

a) Define Internet?
b) What is Web 2.0?
c) What is Amazon EC2?
d) What is VM?
e) What is Pay-as-you-go model?
f) What do you mean by Web Service?
g) What is Network Security?
h) What is Client?

Q.3 Answer the following. (Any Three) **12**

a) What is Multi-core operating systems?
b) What is Host Level Security?
c) What is Cloud?
d) What do you mean by Machine Image?

Q.4 Answer the following. (Any Two) **12**

a) Define PaaS? Discuss in detail SOA with suitable example?

b) State and explain architecture modelling to show working of Cloud Computing?

c) Explain in detail the approach of Data Storage in Cloud Computing?

Q.5 Answer the following. (Any Two) **12**

a) Define SaaS? Explain various characteristics of SaaS with suitable example?

b) Discuss Cloud Platform and Management using Google App Engine Service?

c) Define Cloud Computing? Explain Cloud Deployment Model with example?

Seat No.	

Set **P**

M.Sc. (Computer Science) (Sem - III) (Old) (CBCS) Examination: March/April - 2025
Digital Image Processing (MSC18301)

Day & Date: Thursday, 15-May-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figure to the right indicate full marks.
4) Use of scientific calculator is allowed.

Q.1 Select the correct alternative. **16**

1) Gamma correction is mostly used in _____.
a) CRT b) Audio
c) Radio d) Music

2) DFT stands for _____.
a) Digital Fourier Transform b) Discrete Fourier Table
c) Discrete Fourier Transform d) Digital Fourier Table

3) The Hit-or-Miss transformation is defined in terms of _____ structuring elements.
a) zero b) one
c) two d) none of these

4) A filter in which the filtering is applied separately for illumination and reflectance component is _____ filtering.
a) Frequency domain b) Spatial domain
c) Homomorphic d) Lowpass

5) An 8-bit RGB color image having size 16X64 needs _____ kBytes of storage.
a) 3 b) 24
c) 1024 d) 2072

6) The second order derivative of image sharpening called as _____.
a) Gaussian b) Laplacian
c) Canny d) Euclid

7) Fisher in 1936 proposed _____ problem.
a) recognition b) identification
c) classification d) description

8) Which of the following is not alternative word used for pixels?
a) Image elements b) Pils
c) Picture elements d) None of the above

9) Which of the following techniques is primarily used for reducing image noise in spatial filtering?
a) Histogram equalization b) Smoothing filters
c) Edge detection d) Arithmetic operations

10) Which of the following methods is used in object recognition based on statistical properties of patterns?
a) Decision-theoretic methods b) Structural methods
c) Template matching d) Principal component analysis

11) In image segmentation, which of the following methods is used to detect edges based on discontinuities in intensity?
a) Thresholding b) Edge linking
c) Region-based segmentation d) Detection of discontinuities

12) Which of the following operations in morphological image processing is used to remove small objects from an image?
a) Erosion b) Dilation
c) Opening d) Closing

13) What is the primary purpose of the Fourier transform in image processing?
a) To convert an image from the spatial domain to the frequency domain
b) To enhance edges in an image
c) To smooth an image in the spatial domain
d) To perform segmentation

14) Which of the following is typically used in image restoration to reduce noise in the presence of only noise?
a) Morphological filters b) Spatial filtering
c) Histogram equalization d) Fourier transform

15) Which of the following is an example of a nonlinear operation in image processing?
a) Histogram equalization b) Linear smoothing filter
c) Sharpening filter d) Convolution operation

16) In the context of image restoration, what is the main purpose of homomorphic filtering?
a) To enhance low-frequency components of the image
b) To remove periodic noise from the image
c) To correct for non-uniform illumination in the image
d) To sharpen the edges of the image

Q.2 Write short notes on the following. **16**

a) Gaussian noise, salt-and-pepper noise
b) Regional descriptor
c) Contrast stretching
d) Butterworth Filter

Q.3 Answer the following question **16**

a) Explain Fundamental step of digital image processing.
b) Explain Smoothing spatial filter in details.

Q.4 Answer the following question **16**

a) Explain histogram processing.
b) Explain Image degradation model.

Q.5 Answer the following question **16**

a) Explain the Hit-or-Miss transformation.
b) Threshold following image using global thresholding algorithm.

19	122	165	138	211
187	195	133	199	89
114	142	93	178	209
134	149	163	190	210
60	169	188	205	177

Select initial threshold as 115 and stop algorithm when difference of threshold is less than 0.1.

Q.6 Answer the following question **16**

a) What is Adjacency and connectivity? Explain different types of Adjacencies and connectivity in detail.
b) Explain how watershed segmentation works and its application in separating connected objects in an image.

Q.7 Answer the following question **16**

a) Discuss how homomorphic filtering is used for simultaneous enhancement of the image's contrast and illumination.
b) Explain how decision-theoretic methods are used to classify patterns based on probabilities and statistical models.

Seat No.	

Set P

M.Sc. (Computer Science) (Sem - III) (Old) (CBCS) Examination: March/April - 2025
Open Source Technologies (PHP, MySql) (MSC18302)

Day & Date: Saturday, 17-May-2025 Max. Marks:80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) What does PHP stand for?
   a) Personal Home Page
   b) Hypertext markup
   c) Pretext Hypertext Processor
   d) Preprocessor Home Page

2) Who is the father of PHP?
   a) Rasmus Lerdorf b) Wiliam Makepiece
   c) Drek Kolkevi d) List Barely

3) We can use _____ to comment a single line?
   i) /? ii) //
   iii) # iv) /**/
   a) Only (ii) b) (i), (iii) and (iv)
   c) (ii), (iii) and (iv) d) Both (ii) and (iv)

4) PHP's numerically indexed array begin with position _____.
   a) 1 b) 2
   c) 0 d) -1

5) Which of the functions is used to sort an array in descending order?
   a) sort() b) asort()
   c) rsort() d) dsort()

6) if $a = 12 what will be returned when ($a == 12) ? 5 : 1 is executed?
   a) 12 b) 1
   c) Error d) 5

7) Which function returns an array consisting of associative key/value pairs?
   a) count() b) array_count()
   c) array_count_values() d) count__values()

8) Functions in PHP should start with which of the following keyword?
   a) function b) def
   c) void d) none

9) Which one of the following functions is used to determine whether a class exists?
   a) exist() b) exist_class()
   c) class_exist() d) _exist()

10) Which of the following is used to execute queries with mysql database?
   a) mysqli_query() b) mysqli_error()
   c) mysqli_insert() d) mysqli_connect()

B) Fill in the blank. **06**

1) _____ is used to display the output in PHP?
2) _____ is used for concatenation?
3) _____ function returns the length of string.
4) _____ function is used to set cookie in PHP?
5) _____ method, variables are displayed in the URL.
6) _____ block always execute where error occurred or not?

Q.2 Answer the following. **16**

a) Client side scripting Vs Server side scripting?
b) Explain associative array?
c) Explain server?
d) Explain <form> tag?

Q.3 Answer the following. **16**

a) Explain various in built string functions.
b) Explain session with suitable example.

Q.4 Answer the following. **16**

a) Explain Multidimensional arrays with examples.
b) Explain custom exception with example

Q.5 Answer the following. **16**

a) Write a PHP code creating and deleting cookie variable.
b) Design a web application to perform following task on student table
   1. Add New **2.** Save **3.** Delete **4.** Update **5.** Display.

Q.6 Answer the following. **16**

a) Explain MySQL datatypes.
b) Explain history of PHP with versions.

Q.7 Answer the following. **16**

a) Write a PHP code create form using text, button control and retrieving form data using $_REQUEST variable.
b) Explain various file modes and write a code to read character.

Seat No.	

Set **P**

M.Sc. (Computer Science) (Sem - III) (Old) (CBCS) Examination: March/April - 2025
Network Security (MSC18307)

Day & Date: Monday, 19-May-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) _____ means that the sender and the receiver expect privacy.
   a) Message confidentiality b) Message integrity
   c) Message authentication d) Message authorization

2) DES stands for _____.
   a) Data Encryption Standard b) Data Encryption Subscription
   c) Data Encryption Solutions d) Data Encryption Slots

3) In public key cryptography, _____ key that decrypts the message.
   a) Public key b) Unique key
   c) Private key d) Security key

4) A digital signature needs _____ system.
   a) symmetric-key b) asymmetric-key
   c) both a and b d) none of these

5) In PGP, to exchange e-mail messages, a user needs a ring of _____ keys.
   a) Secret b) Public
   c) either (a) or (b) d) both (a) and (b)

6) _____ means a variety of techniques used for enforcing access permissions to the system resources.
   a) Digital Signature b) Authentication
   c) Access control d) Routing Control

7) Which of the following is the category of threat?
   a) Program Threat b) System Threat
   c) Both a & b d) None of these

8) Data encryption standard is a block cipher and encrypts data in blocks of size of _____ each.
   a) 16 bits b) 64 bits
   c) 32 bits d) 128 bits

9) _____ provide security at the transport layer.
   a) SSL b) TLS
   c) Both a and b d) None of these

10) An attempt to break security and make unauthorized use of an asset means _____.
   a) Attack b) Threat
   c) Risk d) Security

B) Fill in the blank. **04**

1) MIME is abbreviated as _____.
2) _____ provides privacy, integrity, and authentication in e-mail.
3) _____ is the key size of DES algorithm in cryptography.
4) SSL provides _____.
5) _____ cipher, the same key is used by both the sender and receiver.
6) LDAP is abbreviated as _____.

Q.2 Answer the following. **16**

a) What is mean by Proxy Severs? Explain Firewall setting in Proxy Servers.
b) Mention the strengths and weakness of DES algorithm.
c) Explain the need of Transport Layer Security.
d) Explain the features of IP security

Q.3 Answer the following. **16**

a) Explain Network Security Architectures in details.
b) Explain the concept of SET with its services.

Q.4 Answer the following. **16**

a) What is e-mail security? Explain the technique for e-mail security.
b) Define the Firewall? Explain different types of firewall in details.

Q.5 Answer the following. **16**

a) List and briefly define categories of security services.
b) Explain the architecture of IP Security.

Q.6 Answer the following. **16**

a) Briefly explain Non- Interference and Role Base Model in Access Control Mechanisms.
b) Explain the services provided by PGP in detail.

Q.7 Answer the following. **16**

a) What is intruder? Explain intrusion detection and prevention.
b) Explain RSA algorithm in detail.

Seat No.	

Set **P**

M.Sc. (Computer Science) (Sem - III) (Old) (CBCS) Examination: March/April - 2025
Cloud Computing (MSC18308)

Day & Date: Monday, 19-May-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) Cloud computing is the on-demand availability of computer system resources, especially data storage and computing power, without direct active management by the _____.
   a) Computer b) User
   c) Robot d) Chat bot

2) The latest version of the _____ definition does require that cloud computing networks use virtualization and support multi-tenancy.
   a) Client/Server
   b) TCP/IP
   c) ISO-OSI
   d) National Institute of Standards and Technology

3) Amazon Web Services mainly offers IaaS, which in the case of its _____ service means offering VMs with a software stack.
   a) MAPE-K b) EC2
   c) Hyper-V d) OVF

4) With SaaS, the customer uses the application as needed and is _____ responsible for the installation and its maintenance, or its upkeep.
   a) Sometime b) Maximum
   c) Always d) Not

5) The PaaS service provider manages the cloud infrastructure, the _____ systems, and the enabling software.
   a) Storage b) Operating
   c) Application d) Networking

6) A software layer, the hypervisor, mediates access to the physical hardware presenting to each guest operating system a _____ machine, which is a set of virtual platform interfaces.
   a) Vendor b) Verified
   c) Virtual d) Viewer

7) Google AppEngine, an example of Platform as a Service, offers a _____ environment for developing and hosting web applications.
   a) Non-Scalable b) Reduced
   c) Scalable d) Physical

8) Private cloud as internal data center of a business or other organization, not made available to the _____ public.
   a) North American b) Private
   c) General d) Asia

9) Exposing a interface, through which users can easily interact with the system, is a highly desirable feature of a Virtual Infrastructure manager.
   a) Self-service b) Graphical User
   c) Server/Client d) Command Line

10) In a multi-tenant cloud a great disparity between user needs is often the case. Thus, resources rented from the cloud must be _____ customizable.
   a) highly b) less
   c) minimum d) randomly

B) State True/False. **06**

1) Computing facilities are being made available as services offered by non-reputed vendors.
2) Computing infrastructure requires adequate hardware procurement.
3) Computing infrastructure' facility includes all physical computing devices or hardware components like the processor, memory, network, storage devices and other hardware appliances.
4) Platform consists of the virtual computing device loaded with virtualization software, storage, networking where the program or application can run.
5) Applications software constitute the topmost layer of this layered architecture.
6) Cloud computing signifies a major change in the approach how information is stored and applications can run.

Q.2 Answer the following. **16**

a) What do you mean by Cloud?
b) What is meant by Web Services?
c) State the meaning of Hybrid Cloud?
d) State and explain Intranet and Internet?

Q.3 Answer the following. **16**

a) Define Cloud Computing? Discuss in detail characteristics of Cloud Computing.
b) What is IaaS? Discuss in detail the various approaches of IaaS?

Q.4 Answer the following. **16**

a) State and explain in detail Service Oriented Architecture with example.

b) Discuss in detail Cloud Deployment Model with suitable example?

Q.5 Answer the following. **16**

a) State the meaning of Hypervisors? Discuss in detail virtualization approaches?

b) What is SaaS? State and explain benefits of SaaS with suitable example.

Q.6 Answer the following. **16**

a) What do you mean by PaaS? State and explain characteristics and approaches of Google App Engine?

b) State and explain in detail Network level security with example?

Q.7 Answer the following. **16**

a) Differentiate between on-premises versus cloud computing system?

b) What do you mean by Web 2.0 ? State and discuss key benefits of Web 2.0?

Seat No.	

Set | P

M.Sc. (Computer Science) (Sem - III) (Old) (CBCS) Examination: March/April - 2025
Mobile Computing (MSC18309)

Day & Date: Monday, 19-May-2025 Max. Marks: 80.00
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) Which of the following is a feature of PCS (Personal Communications Services)?
   a) Wide area coverage b) High mobility
   c) Fixed-line communication d) Wired communication

2) What is the primary purpose of GSM?
   a) Voice and data communication
   b) Satellite communication
   c) Fixed-line communication
   d) Low-speed data transmission

3) Which type of communication is supported by the General Packet Radio Service (GPRS)?
   a) Digital voice b) Digital data
   c) Analog voice d) Analog data

4) Which network architecture does the IEEE 802.11 standard refer to?
   a) Cellular network b) WLAN (Wireless LAN)
   c) Satellite network d) Local area network

5) What is the full form of WAP in mobile communications?
   a) Wireless Access Point b) Wireless Application Protocol
   c) Web Access Protocol d) Wireless Application Point

6) What is the main function of a WAP gateway?
   a) To provide internet access
   b) To transmit SMS
   c) To convert wireless data into standard HTTP
   d) To create a VPN network

7) Which technology is used in CDMA2000 for mobile communication?
   a) Frequency Division Multiple Access (FDMA)
   b) Time Division Multiple Access (TDMA)
   c) Code Division Multiple Access (CDMA)
   d) Wavelength Division Multiple Access (WDMA)

8) What is the benefit of using WLL (Wireless Local Loop)?
   a) Higher bandwidth b) Easier installation in rural areas
   c) Dedicated private lines d) Easier mobile phone use

9) In mobile satellite systems, which type of orbit is typically used by Iridium?
   a) Low Earth Orbit (LEO)
   b) Medium Earth Orbit (MEO)
   c) Geostationary Orbit (GEO)
   d) Highly elliptical orbit

10) Bluetooth technology operates at which frequency?
   a) 2.4 GHz b) 5 GHz
   c) 900 GHz d) 1.8 GHz

B) Write True/False. **06**

1) PCS operates only in fixed-line networks.
2) GPRS supports only voice communication.
3) IEEE 802.11 standard is associated with WLANs (Wireless Local Area Networks).
4) WAP is used for mobile internet services.
5) The IRIDIUM satellite system uses geosynchronous orbit.
6) Bluetooth is primarily used for short-range wireless communication.

Q.2 Answer the following. **16**

a) What is the architecture of GSM and its mobility management?
b) How does Mobile IP work in wireless communication?
c) Compare CDMA2000 and WCDMA technologies in 3G communication systems.
d) What are the applications of Bluetooth technology in mobile communications?

Q.3 Answer the following. **16**

a) Discuss the working and components of the IRIDIUM Global Mobile Satellite System.
b) Write a detailed note on the architecture and components of GPRS.

Q.4 Answer the following. **16**

a) Explain the significance of the WAP gateway in mobile communication and its different protocols.
b) Discuss the role of Bluetooth technology in modern enterprise networks and mobile devices.

Q.5 Answer the following. **16**

a) Describe the role of third-generation (3G) services and the technologies used in 3G communication.
b) Discuss the concept and advantages of Virtual Networks in enterprise environments.

Q.6 Answer the following. **16**

a) Explain the role of GPRS in mobile data communication. Discuss how it enhances mobile services.

b) What are the key features and benefits of WLL (Wireless Local Loop) architecture?

Q.7 Answer the following. **16**

a) Explain how the WAP protocol works and the significance of Wireless Markup Language (WML).

b) Discuss the importance of mobile satellite systems in providing global connectivity. Mention the differences between IRIDIUM and other satellite systems.

Seat No.	

Set **P**

M.Sc. (Computer Science) (Sem - IV) (New) (CBCS) Examination: March/April - 2025
Machine Learning (2318401)

Day & Date: Wednesday, 14-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Fill in the blanks by choosing correct alternatives given below. 08

1) Machine Learning is programming computers to optimize a _____ criterion using example data or past experience.
a) Examination b) Evaluation
c) Solution d) Performance

2) In finding an _____, that means learning a conditional probability.
a) Preservative Rule b) Convolution Rule
c) Disjunction Rule d) Association Rule

3) A _____ that fits the past data, if the future is similar to the past, then researchers can make correct predictions for novel instances.
a) Design b) Testing
c) Rule d) Scale

4) A _____ navigating in an environment in search of a goal location is another application area of reinforcement learning.
a) Robot b) Airplane
c) Target d) Bike

5) Bayesian formalism allows us to define our prior information on the _____ factors and the model, as well as to infer the model parameters.
a) Shown b) Customized
c) Covered d) Hidden

6) If there is noise, an over complex hypothesis may learn not only the underlying function but also the noise in the data and may make a _____ fit.
a) Good b) Better
c) Best d) Bad

7) Principal component analysis (PCA) is an unsupervised method in that component analysis does not use the output information; the criterion to be maximized is the _____.
a) Bias b) Standard deviation
c) Variance d) Mean

8) Machine Learning application areas like vision, speech, and _____ are also tasks that are best learned from sample data.

a) Realistic b) Non-realistic
c) Robotics d) Ideas

B) Write True/False. **04**

1) Lasso regression is a linear regression technique that combines model building with feature selection by adding a penalty term to the cost function, which forces some coefficients to zero, effectively removing less important predictors from the model.
2) Learning can be and cannot be viewed as the task of searching through a large space of hypotheses implicitly defined by the hypothesis representation.
3) K-Means learning is a method for approximating discrete-valued target functions.
4) SVM is a versatile supervised learning algorithm widely used for both classification and regression tasks.

Q.2 Answer the following question (Any Six) **12**

a) What is Conditional Independence?
b) Define SVM.
c) What is Dimension Reduction?
d) What do you mean by Reinforcement Learning?
e) State the meaning of PCA.
f) Define Bias and Variance.
g) What is Artificial Intelligence?
h) What do you mean by Association Rule?

Q.3 Answer the following question (Any Three) **12**

a) What do you mean by Random Forest?
b) What is Regression?
c) State the meaning of Posterior Probability.
d) Explain in brief Machine Learning versus Deep Learning.

Q.4 Answer the following question (Any Two) **12**

a) State and explain in detail various steps of K-Nearest Neighbour Algorithm with suitable examples.
b) How Supervised and Unsupervised learnings are different?
c) Explain Market Basket Analysis using Apriori algorithm with suitable example.

Q.5 Answer the following question (Any Two) **12**

a) State and Differentiate between Linear versus Logistic Regression with suitable example.
b) Define Machine Learning. State and explain various applications of Machine Learning.
c) State and explain various steps of K-Means Clustering for Given Points - M(2, 2), N(3, 2), P(1, 1), Q(3, 1), R(1.5, 0.5) and with initial cluster points (2,2) and (3,1)?

Seat No.	

Set **P**

M.Sc. (Computer Science) (Sem - IV) (New) (CBCS) Examination: March/April - 2025
Network Security (2318402)

Day & Date: Friday, 16-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **08**

1) _____ an entity capable of accessing objects.
   a) Object b) Subject
   c) Access right d) None of these

2) The heart of the X.509 scheme is the _____ certificate associated with each user.
   a) private-key b) secret-key
   c) public-key d) duplicate key

3) _____: Specification of key management capabilities.
   a) RFC 2401 b) RFC 2402
   c) RFC 2406 d) RFC 2408

4) SET stands for _____.
   a) Secure Electronic Transaction
   b) Secure Encryption Transmission
   c) Sequential Electronic Transaction
   d) Serial Encryption Transaction

5) _____ is an authentication service developed as part of Project Athena at MIT.
   a) SMTP b) SSL
   c) HTTP d) Kerberos

6) A _____ takes place when one entity pretends to be a different entity.
   a) Modifications of message b) Replay
   c) Masquerade d) denial of service

7) MIME is an extension to the _____ framework that is intended to address some of the problems and limitations of the use of SMTP.
   a) RFC 822 b) RFC 2402
   c) RFC 2406 d) RFC 2408

8) _____ identifies a security association.
   a) Sequence Number b) Security parameters Index
   c) Payload Data (variable) d) None of these

B) Write True or False. **04**

1) Security attack means any action that compromises the security of information owned by an organization.
2) Passive attacks involve some modification of the data stream or the creation of a false stream.
3) A block cipher processes the input one block of elements at a time, producing an output block for each input block.
4) Ciphertext is the original message or data that is fed into the algorithm as input.

Q.2 Answer the following. (Any Six) **12**

a) What is traffic analysis? Explain in short.
b) What is authentication?
c) Explain the use of Access matrix.
d) What is the importance of Key Escrow.
e) What is decryption algorithm?
f) State the features of Proxy Server.
g) What is smart card? Explain in short.
h) Explain features of firewall.

Q.3 Answer the following. (Any Three) **12**

a) What is Biometric? Explain different forms of Biometrics with suitable example.
b) What is digital signature? Explain the importance of it.
c) Explain Model for Network security with well labelled diagram.
d) Explain Chinese wall model with example.

Q.4 Answer the following. (Any Two) **12**

a) What is Attack? Explain different types of Passive attacks.
b) How block cipher works? Explain with example.
c) Explain the applications of IPSec.

Q.5 Answer the following. (Any Two) **12**

a) What is Secure Socket Layer Protocol? Explain the use of Handshake Protocol.
b) Explain DES algorithm with suitable example.
c) What is Firewall? Explain the types of firewalls.

Seat No.	

Set **P**

M.Sc. (Computer Science) (Sem - IV) (New) (CBCS) Examination: March/April - 2025
Net Technology (2318405)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **08**

1) What is the extension of the ASP.NET page?
a) .asp b) .apx
c) .asx d) .aspx

2) Which is the correct basic syntax of the Control directive?
a) <%@ Control %>
b) <%@ Control Language="C#" Enable ViewState=”false" %>
c) <%@ Control Language="C#" %>
d) None of the above

3) Which term is used for pages that depend on the Master page?
a) Master Pages b) Content Pages
c) Web Pages d) None of the above

4) You want to make a configuration setting change that will affect only the current Web application. Which file will you change?
a) Global.asax
b) Web.config in the root of the Web application
c) Machine.config
d) All of the above

5) What is the file extension of Webservices in ASP.Net?
a) .aspx b) .asp
c) .asmx d) .asm

6) Which is/are the components of ADO.NET?
a) Data Adaptor b) Command
c) Connection d) All of the above

7) Which is not a page event in ASP.Net?
a) UpLoad b) Load
c) LoadComplete d) PreLoad

8) Which is the correct basic syntax of Application directive?

a) <%@ Application_DIR Language=”C#" %>
b) <!-- Application Language="C#" -->
c) <%@ Application Language="C#"%>
d) <%@ DIR @Application Language="C#" %>

B) Write true/false. **04**

1) The AutoPostBack is a property for web controls in ASP.NET.
2) The cookies are stored on Cache Memory.
3) Check Box is a server-side control in ASP.NET.
4) There is no multiple inheritance in C#.NET. That is, a class cannot be derived from multiple base classes.

Q.2 Answer the following. (Any Six) **12**

a) What is the use of HiddenField in ASP.NET?
b) What is the difference between Session and Application state?
c) What is PostBack in ASP.NET?
d) What is the purpose of a validation control in ASP.NET?
e) What is a DataAdapter?
f) What is the function of Global.asax file?
g) Define CTS and explain its role in .NET.
h) Need of Master Pages.

Q.3 Answer the following. (Any three). **12**

a) What is namespace? How to create and use namespace in .NET?
b) Compare with example Client-Side versus Server-Side Validation.
c) Explain #define and #undef with example.
d) Explain Regular Expression Validator Control in asp.net with example.

Q.4 Answer the following. (Any two) **12**

a) Explain ASP.NET Page Life Cycle Events.
b) What is ASP.NET Application Folders? Explain in detail.
c) What is state management? Explain server side state management techniques.

Q.5 Answer the following. (Any two) **12**

a) What is master page? Explain steps to create master page.
b) Explain ASP.Net directives in brief.
c) Explain RangeValidator Control and CompareValidator Control with example.

Seat No.	

Set **P**

M.Sc. (Computer Science) (Sem - IV) (New) (CBCS) Examination: March/April - 2025
Block Chain Technology (2318406)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All Questions are compulsory.
3) Figures to the right indicates full marks.

Q.1 A) Choose correct alternative. **08**

1) What is a miner?
a) Type of blockchain
b) Computers that validate and process blockchain transactions
c) An algorithm that predicts the next part of the chain
d) None of these

2) Which is NOT a part of asymmetric encryption?
a) Public key b) Mining
c) Passphrase d) Private Key

3) What is the term for when a blockchain splits?
a) Merger b) Fork
c) Sidechain d) None of these

4) Who is introduced the digital online cryptocurrency known as Bitcoin?
a) Satoshi Nakamoto b) Nick Szabo
c) Wei Dai d) Hal Finney

5) POW stands for _____.
a) Proof of Word
b) Proof of Wisdom
c) Sends information to the blockchain network
d) Proof of Work

6) In blockchain, a block is consist of _____?
a) Transaction data b) A Hash point
c) A Timestamp d) All of the these

7) What programming language is primarily used to write Ethereum smart contracts?
a) Java b) Go
c) Python d) Solidity

8) What is the main component of a blockchain that contains transaction data?

a) Chain b) Node
c) Block d) Hash

B) Write true/false **04**

1) Is it possible to program a blockchain to record transactions automatically?

a) True b) False

2) Only 21 million maximum number of bitcoins that can be created?

a) True b) False

3) Decentralized blockchains are immutable?

a) True b) False

4) A node is computer on blockchain network.

a) True b) False

Q.2 Answer the following. (Any Six) **12**

a) Consensus algorithm methods
b) Distributed Ledger
c) Bitcoin
d) Sharding
e) EVM
f) Non-Fungible Token
g) Private Blockchains
h) Sybil attack

Q.3 Answer the following. (Any three) **12**

a) What is Blockchain Technology? Explain features of blockchain technology.
b) Explain Cryptography keys in detail?
c) What is Zero-Knowledge Systems (ZKS)? Explain in detail?
d) What is difference between Blockchain 1.0 and Blockchain 2.0?

Q.4 Answer the following. (Any Two) **12**

a) Explain Hash Pointer technology used in blockchain?
b) What is Hash functions? State Features of Hash Functions?
c) Explain different security issues in Blockchain?

Q.5 Answer the following. (Any Two) **12**

a) What is Verifiable Random Functions (VRF)? Explain in detail.
b) What is difference between Blockchain 2 and Blockchain 3?
c) What is Hash functions? State Features of Hash Functions?

Seat No.	

Set P

M.Sc. (Computer Science) (Sem - IV) (New) (CBCS) Examination: March/April - 2025
Soft Computing (2318407)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30PM

Instructions: 1) All Questions are compulsory.
3) Figures to the right indicates full marks.

Q.1 A) Fill in the blanks by choosing correct alternatives given below. 08

1) How many types of random variables are there in Fuzzy logic?
   a) 2 b) 4
   c) 1 d) 3

2) Name the algorithms that acquire from complex environments to generalize, approximate and simplify solution logic.
   a) Ecorithms b) Fuzzy set
   c) Fuzzy Relational DB d) None of the above

3) Each connection link in ANN is linked with _____ that contains statics about the input signal.
   a) Neurons b) Activation function
   c) Weights d) Bias

4) _____ deals with uncertainty problems with its own merits and demerits.
   a) Neuro-fuzzy b) Neuro-genetic
   c) Fuzzy-genetic d) None

5) Core of Soft Computing is _____.
   a) Fuzzy, Neural Computing, Genetic Algorithms
   b) Fuzzy Networks and Artificial Intelligence
   c) Artificial Intelligence and Neural Science
   d) Neural Science and Genetic Science

6) Neural Computing _____.
   a) Mimics Human Brain
   b) Information Processing Paradigm
   c) Both (a) and (b)
   d) None of these

7) What is a fuzzy set in fuzzy set theory?
   a) A set with crisp boundaries
   b) A set with elements having gradual degrees of membership
   c) A set with no defined membership
   d) A set with infinite elements

8) What is the primary function of fuzzy rules in fuzzy logic?
   a) To establish clear-cut rules
   b) To handle imprecise rules
   c) To eliminate uncertainty
   d) To define exact relationships

B) Write True/False **04**

1) Intersection operation is used to combine fuzzy relations in fuzzy systems.
2) The primary objective of rule-based design in fuzzy control is to establish precise rules.
3) The fundamental principle behind Genetic Algorithms (GAs) is natural selection.
4) The selection function determines which individuals will contribute to the next generation based on their fitness scores.

Q.2 Answer the following. (Any Six) **12**

a) What is input Layer?
b) What do you mean by Cardinality?
c) What is Artificial Neuron?
d) Define Fuzzy Set?
e) What is Natural Selection?
f) Define Alpha cut?
g) What do you mean by Hard Computing?
h) What is Genetic Representation?

Q.3 Answer the following. (Any three) **12**

a) What do you mean by Artificial Neural Network?
b) What is Fuzzy Union?
c) What do you mean by Tournament Selection?
d) Explain in brief Crisp and Fuzzy Relations?

Q.4 Answer the following. (Any Two) **12**

a) State and differentiate between Fuzzy Set versus Crisp Set?
b) What is Soft Computing? Explain in detail back propagation algorithm for training neural networks?
c) Explain in detail Binary Fuzzy Relations with suitable example?

Q.5 Answer the following. (Any Two) **12**

a) What is Artificial Neural Networks? Explain in detail various Models and Architecture of Artificial Neurons?
b) State and explain various types of Fuzzy Set Operations with suitable example?
c) What is Reproduction? Explain various types of Selection methods with suitable example?

Seat No.	

Set **P**

M.Sc. (Computer Science) (Sem - IV) (New/Old) (CBCS) Examination: March/April - 2025
.Net Technology (MSC18401)

Day & Date: Wednesday, 14-May-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) Which of the following keyword is used for including the namespaces in the program in C#?
   a) imports b) using
   c) exports d) include

2) Which of the following defines boxing correctly?
   a) When a value type is converted to object type, it is called boxing.
   b) When an object type is converted to a value type, it is called boxing
   c) Both a and b
   d) None of these

3) C# language is used to develop _____.
   a) Console applications b) Windows applications
   c) Web applications d) All of these

4) Which of the following statement is incorrect about delegate?
   a) Delegates are reference types
   b) Delegates are type-safe
   c) Delegates are object-oriented
   d) All of the above

5) Which of the following is the root of the .Net type hierarchy?
   a) System.Parent b) System.Base
   c) System.Root d) System.Object

6) Which of the following attribute must be set on a validator control for the validation?
   a) ControlToValidate b) ValidateControl
   c) ValidateToBind d) ValidateBind

7) Which of the following is the function of Common Language Runtime (CLR)?
   a) It provides core services such as memory management, thread management, and remoting.
   b) It enforces strict type safety.
   c) It provides Garbage Collection Services.
   d) All of the above

8) _____ is the extension of the ASP.NET page.
   a) .aspx b) .asp
   c) .asm d) .asmx

9) Which of the following is the component of ADO.NET?
   a) Data Adaptor b) Command
   c) Connection d) All of these

10) Value type data is stored in _____.
   a) Queue b) Stack
   c) Heap d) list

B) Write True or False. **06**

1) The extension of *C#* language file is .csp.
2) An indexers can be declared inside a class, struct, and an interface.
3) ContentPlaceHolder is defined in the master page, which can be overridden by content pages.
4) Cookies is a server-side state management technique.
5) By default System.Web.Ul.Page class is the web form inherited in ASP.NET.
6) Page_Load is the first event called by every control.

Q.2 Write short note on the following. **16**

a) Differences between DataReader and DataSet
b) Indexers
c) Metadata
d) ViewState

Q.3 Answer the following. **16**

a) Explain event with suitable example.
b) Explain ASP.Net page life cycle.

Q.4 Answer the following. **16**

a) Create a web application to insert a new record in the student table.
b) What is state management? Differentiate between application state and session state with example.

Q.5 Answer the following. **16**

a) Explain multicast delegate with example.

b) What is CTS? Explain in details CTS and CLS.

Q.6 Answer the following. **16**

a) Create a web page that displays the Examination schedule in the calendar control.

b) Explain custom validation with suitable example.

Q.7 Answer the following. **16**

a) Explain the architecture of ASP.NET.

b) What is nesting master page? Explain the concept of nesting master page and its use with suitable example.

Seat No.	

Set P

M.Sc. (Computer Science) (Sem - IV) (New/Old) (CBCS) Examination: March/April - 2025
Machine Learning (MSC18402)

Day & Date: Friday, 16-May-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) The ___ method can be used to read a CSV file into a Pandas DataFrame.
   a) pd.to_csv('file.csv') b) pd.read_csv('file.csv')
   c) pd.load_csv('file.csv') d) pd.csv_to_df('file.csv')

2) The _____ type of ML uses rewards to learn a policy.
   a) Supervised Learning b) Unsupervised Learning
   c) Neural Network Learning d) Reinforcement Learning

3) To create a simple line plot with Matplotli, _____ command is used.
   a) plt.plot(x, y) b) plt.scatter(x, y)
   c) plt.line(x, y) d) plt.draw(x, y)

4) Random Forest is based on which of the _____concepts.
   a) Boosting b) Bagging
   c) Gradient Descent d) Neural Networks

5) SVM works on _____.
   a) Clustering
   b) Dimensionality reduction
   c) Finding a hyperplane that separates classes
   d) Decision Trees

6) Naive Bayes is best suited for _____.
   a) Continuous data b) Regression problems
   c) Image recognition d) Text classification problems

7) Polynomial regression is used to model _____.
   a) Linear relationships only
   b) Feature dimensionality reduction
   c) Non-linear relationships by using polynomial features
   d) Feature noise

8) The _____ technique is NOT a dimensionality reduction technique.
   a) PCA b) SVM
   c) t-SNE d) SVD

9) Cross-validation is a technique used to _____.
   a) Avoid underfitting
   b) Optimize data collection
   c) Eliminate noise
   d) Evaluate a model's performance on multiple datasets

10) Boosting focuses on _____.
   a) Combining multiple strong classifiers equally
   b) Giving more weight to misclassified observations
   c) Removing noisy observations
   d) Adding new features

B) Fill in the blank. **06**

1) _____ command is used tp find the dimension of a NumPy array named arr.
2) In _____ machine learning technique involves unlabeled data.
3) The degree of errors that change with new data is known as _____.
4) The _____ library is most used for probability computations in Python.
5) SVD stands for _____.
6) Dividing text into smaller units like words or phrases in NLP are known as _____.

Q.2 Answer the following. **16**

a) What is Overfitting and underfitting? Explain in detail.
b) What is bagging technique? Explain with example.
c) Explain Naive Bayes algorithm with example.
d) Explain Machine Learning Applications in healthcare.

Q.3 Answer the following. **8+8**

a) Explain difference between Al, Machine Learning and Deep learning.
b) What is text analysis? Explain use of text analysis with example.

Q.4 Answer the following. **8+8**

a) What is decision tree? Explain decision tree in detail.
b) What is Unsupervised learning? Explain association rule mining with any one algorithm.

Q.5 Answer the following. **8+8**

a) What are the various ways to create arrays in NumPy, including methods like zeros(), ones(), arange(), random(), randn(), linspace(), and logspace(), as well as creating identity and diagonal matrices? Five examples of each.
b) What is data reduction? Explain PCA algorithm in detail.

Q.6 Answer the following. **10+6**

a) Consider following data points. Convert this data into 2 clusters.
(1, 2), (2, 3), (3, 3), (8, 8), (9, 8), (8, 9)

b) Explain Monte Carlo Prediction in detail.

Q.7 Answer the following. **10+6**

a) From following data, find equation.

X	1.7	1.5	2.8	5	1.3	2.2	1.3
Y	368	340	665	954	331	556	376

b) Explain steps of Machine learning in detail.

Seat No.	

Set **P**

M.Sc. (Computer Science) (Sem - IV) (New/Old) (CBCS) Examination: March/April - 2025
Data Warehouse and Mining (MSC18403)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) The key characteristic of a Data Warehouse is _____.
a) Volatile b) Real-time updating
c) Subject-oriented d) Unstructured

2) In Data Cube Technology "Roll-up" is nothing but _____.
a) Drilling down to more detailed data
b) Sorting the data
c) Cleaning the data
d) Aggregating data to a higher level

3) THE _____ is NOT an issue in classification and prediction.
a) Feature selection b) Data encryption
c) Model training time d) Choosing irrelevant variables

4) The initial step in decision tree algorithm is to _____.
a) Split data randomly
b) Map data into clusters
c) Create random associations
d) Select the feature with maximum entropy

5) The _____ technique uses historical data to forecast outcomes or trends.
a) Regression b) Clustering
c) Data visualization d) Association Rule

6) Backpropagation is associated with _____ type of neural network.
a) Feedforward Neural Networks
b) Support Vector Machines
c) Decision Trees
d) K-Means Clustering

7) The accuracy of decision trees' is affected by _____.
   a) Data sparsity
   b) Depth of the decision tree
   c) Probabilistic assumptions
   d) Data clustering

8) The _____ component of a Data Warehouse ensures data cleaning and transformation.
   a) OLAP b) Data Mart
   c) Metadata d) ETL

9) The _____ technique is NOT a Data Mining functionality.
   a) Classification b) Extraction
   c) Prediction d) Clustering

10) The hierarchical clustering primarily focused on _____.
   a) Dividing clusters using statistical averages
   b) Creating a tree-like structure of nested groups
   c) Analyzing data with density-based measures
   d) Reducing clusters to individual outliers

B) Fill in the blank. **06**

1) OLAP stands for _____.
2) The _____ algorithm is commonly used method to discover association rules.
3) The Bayesian Classification is based on _____ mathematical/ statistical concept.
4) In _____ based clustering, grouping data points based on their spatial proximity and density.
5) The _____ type of clustering method divides data into non-overlapping groups.
6) The _____ method is efficient for mining association rules at multiple abstraction levels.

Q.2 Answer the following. **16**

a) Explain different splitting measures used in decision tree.
b) What is Apriori pruning property? Explain in detail with its uses.
c) Explain how to create fact and dimension tables? Explain with example.
d) What are drawbacks of K-means clustering? Which algorithm solves these drawbacks. Explain in detail.

Q.3 Answer the following. **16**

a) Explain Data Warehouse Architecture in detail.
b) What is use of binning? Explain types of binning with example.

Q.4 Answer the following. **16**

a) What is data cleaning? Explain different technique for data cleaning.
b) What is multilevel association? Explain with example.

Q.5 Answer the following. **16**

a) What is back propagation? Explain feed forward technique in detail.

b) What is DBScan algorithm? Explain technique with example.

Q.6 Answer the following. **16**

a) Find frequent set of following dataset using min_supp=2.

TID	items
T1	I1, I2, I5
T2	I2, I4
T3	I2, I3
T4	I1, I2, I4
T5	I1, I3
T6	I2, I3
T7	I1, I3
T8	I1, I2, I3, I5
T9	I1, I2, I3

b) Explain application of data mining in text.

Q.7 Answer the following. **16**

a) Cluster the following 2D points into 2 groups using K-Means technique
(1, 2), (1, 4), (1, 0), (10, 2), (10, 4), (10, 0)

b) Explain trends in data mining in detail.

Seat No.	

Set P

M.Sc. (Computer Science) (Sem - IV) (New/Old) (CBCS) Examination: March/April - 2025: Soft Computing (MSC18409)

Day & Date: Thursday, 22-May-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) Fuzzy Computing _____.
   a) mimics human behavior b) deals with imprecise, probabilistic
   c) exact information d) both a and b

2) Hard computing performs what type of computation _____.
   a) sequential b) parallel
   c) approximate d) both a and b

3) Genetic algorithm belong to the family of method in the _____.
   a) artificial intelligence area
   b) optimization area
   c) complete enumeration family of methods
   d) non computer based isolation area

4) The intersection of two fuzzy sets is the _____ of each element from two sets.
   a) maximum b) minimum
   c) equal to d) not equal to

5) Genetic algorithms are example of _____.
   a) heuristic b) evolutionary algorithm
   c) aco d) pso

6) Chromosomes are actually?
   a) line representation b) string representation
   c) circular representation d) all of these

7) Three main basic features involved in characterizing membership function are _____.
   a) intuition, inference, rank ordering
   b) fuzzy algorithm, neural network, genetic algorithm
   c) core, support, boundary
   d) weighted average, center of sums, median

8) Neural network computing _____.
   a) mimics human behaviour b) information processing paradigm
   c) both a and b d) none of the above

9) In artificial Neural Network interconnected processing elements are called _____.
   a) nodes or neurons b) weights
   c) axons d) soma

10) The Value of crisp set can be _____.
   a) either 0 or 1 b) near to 0 or 1
   c) between 0 and 1 d) between 0.5 and 0.7

B) State whether true/ false **06**

1) Fuzzy relations combining two fuzzy sets by connective "min operation" is an operation by Cartesian product.
2) Crisp set theory is not capable of representing descriptions and classifications in many cases.
3) Ability to learn how to do task based on the data is done by self organization.
4) A Fuzzy logic is an extension to the Crisp set, which handles the Partial Truth.
5) Hard computing is tolerant of imprecision, uncertainty, partial truth, and approximation.
6) ART stands for "Adaptive Resonance Theory".

Q.2 Answer the following. **16**

a) Define Fitness Function?
b) What is alpha cut?
c) What do you mean Fuzzy Set?
d) Define Neural Network?

Q.3 Answer the following. **16**

a) Discuss Binary, Octal and Hexa-decimal encoding with suitable example.
b) Explain Fuzzy Intersection, Union and Complements with suitable example.

Q.4 Answer the following. **16**

a) State and explain in detail working of Back-propagation learning network with suitable example.
b) Illustrate the various difference between Fuzzy and Crisp set with example.

Q.5 Answer the following. **16**

a) State and explain in various models of Artificial Neural Network.
b) Explain in detail Roulette Wheel Selection method.

Q.6 Answer the following. **16**

a) State and explain in detail various operations of Fuzzy Relations.

b) Explain the different characteristics of Artificial Neural Network.

Q.7 Answer the following. **16**

a) Explain in detail Genetic Algorithm with Mutation Operator?

b) State and explain Soft, Hard and Hybrid Computing with suitable example.

Seat No.	

Set P

M.Sc. (Computer Science) (Sem - IV) (New/Old) (CBCS) Examination: March/April - 2025
Block chain Technology (MSC18410)

Day & Date: Thursday, 22-May-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) What is a miner?
   a) type of blockchain
   b) Computers that validate and process blockchain transactions
   c) An algorithm that predicts the next part of the chain
   d) None of these

2) Which is NOT a part of asymmetric encryption?
   a) Public key b) Mining
   c) Passphrase d) Private Key

3) What is the term for when a block chain splits?
   a) Merger b) Fork
   c) Sidechain d) None of these

4) Who is introduced the digital online cryptocurrency known as Bitcoin?
   a) Satoshi Nakamoto b) Nick Szabo
   c) Wei Dai d) Hal Finney

5) What is the purpose of a nonce?
   a) Follows nouns
   b) A hash function
   c) Sends information to the blockchain network
   d) Prevents double spending

6) What is Proof of Stake?
   a) certificate needed to use the blockchain
   b) password needed to access an exchange
   c) How private keys are made
   d) transaction and Block Verification protocol

7) What is a smart contract?
   a) Programs stored on a blockchain that run when predetermined conditions are met
   b) Online contract
   c) Digital contract
   d) All the above

8) If a hacker wanted to alter a blockchain, what percentage of the block copies would he have to alter?
   a) Only his copy b) 1%
   c) 51% d) 100%

9) What is a private key?
   a) A key given to the public
   b) A key NOT to be given to the public
   c) key that opens a secret door
   d) None of these

10) What is UTXO?
   a) Unspent Transaction Output
   b) United Transaction Office
   c) Both of these
   d) None of these

B) Fill in the blank/Definition/One sentence answer/ One word answer/ Give the name/Predict the product etc. **04**

1) Ralph Merkle invented Merkle Trees
   a) True b) False
2) Hash function is takes an input of any length and returns a fixed-length string of numbers and letters.
   a) True b) False
3) A Node is computer on block chain.
   a) True b) False
4) Cryptographic Hash function transforms arbitrary length string that act more or less as a fingerprint of the document.
   a) True b) False
5) Immutability is characteristic makes blockchain tamper-proof.
   a) True b) False
6) White Paper is the name of the research paper that brought Bitcoin to the world.
   a) True b) False

Q.2 Answer the following. **16**

a) NONCE
b) Technologies invented in Block chain 3
c) EVM
d) Trilemma of blockchain

Q.3 Answer the following. **16**

a) What is Byzantine Generals Problem? How Bitcoin solves the Byzantine Generals Problem?

b) Explain Proof of work and Proof of Stake?

Q.4 Answer the following. **16**

a) Explain Hash Pointer technology used in blockchain?

b) What is Hash functions? State Features of Hash Functions?

Q.5 Answer the following. **16**

a) What is digital cash? Explain advantages and disadvantages.

b) What are advanced technologies introduced in blockchain 2.0?

Q.6 Answer the following. **16**

a) Explain Bitcoin Scripting language and their use?

b) Explain different security issues in Blockchain?

Q.7 Answer the following. **16**

a) State different features of sharding?

b) What is smart contract and how it similar to real contract?

Seat No.	

Set **P**

M.Sc. (Computer Science) (Semester - II) (CBCS) Examination: March/April - 2025
Artificial Intelligence (MSC18208)

Day & Date: Sunday, 01-June-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q.Nos.1 and 2 are compulsory.
2) Attempt any three questions from Q.No.3 to Q.No.7
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative (MCQ). **10**

1) _____ of the following is a component of Artificial Intelligence.
a) Learning b) Training
c) Designing d) Puzzling

2) _____ of the following are the approaches to Artificial Intelligence.
a) Applied approach b) Strong approach
c) Weak approach d) All of the mentioned

3) _____ of the following can improve the performance of an Al agent.
a) Perceiving b) Learning
c) Observing d) All of the mentioned

4) Bayesian network provide _____.
a) Partial description of the domain
b) Complete description of the problem
c) Complete description of the domain
d) None of the mentioned

5) Decisions of Victory/Defeat are made in Game trees using _____ algorithm.
a) DFS b) Min/Max
c) Heuristic search d) BFS

6) _____ are Semantic Networks.
a) A way of representing knowledge
b) Data Structure
c) Data Type
d) None of the mentioned

7) _____ of the following elements constitutes the frame structure.
a) Facts or Data
b) Procedures and default values
c) Frame names
d) Frame reference in hierarchy

8) _____ process makes different logical expression looks identical.
a) Lifting b) Unification
c) Inference process d) None of the mentioned

9) Bayes rule used for _____.
a) Solving queries
b) Increasing complexity
c) Decreasing complexity
d) Answering probabilistic query

10) _____ is/are the way/s to represent uncertainty.
a) Fuzzy Logic b) Probability
c) Entropy d) All of the mentioned

B) State True or False **06**

1) Content mining is not an application of AI.
2) 8-puzzle is a irrecoverable problem
3) Unify algorithm takes two sentences as input and returns a Unifier.
4) MYCIN uses forward reasoning techniques.
5) An inference algorithm that derives only entailed sentences is called sound or truth-preserving.
6) Basic idea of an partitioned nets is to break network into spaces which consist of groups of nodes and arcs and regard each space as a node.

Q.2 Write Short Note on:- **16**

a) Conceptual dependancy
b) MYCIN
c) Knowledge acquisition
d) Semantic Analysis

Q.3 Answer the Following. **16**

a) Explain the algorithm for breadth first search algorithm
b) Enumerate Classical “Water jug Problem”. Describe the state space for this problem and also give the solution.

Q.4 Answer the Following. **16**

a) What is Resolution? Explain resolution algorithm used for reasoning under predicate logic with example.
b) What do you mean by AI? Explain contribution of AI in various fields.

Q.5 Answer the Following. **16**

a) What is frame and explain in detail with one example?

b) Explain procedural and declarative knowledge representation in detail.

Q.6 Answer the Following. **16**

a) What is script and explain in detail with one example?

b) What is Expert System and explain in detail?

Q.7 Answer the Following. **16**

a) Explain steepest ascent hill climbing algorithm with example?

b) What is unification? Explain the process the unification.

Seat No.	

Set P

M.Sc. (Computer Science) (Sem - II) (CBCS) Examination: March/April - 2025
Statistical Methods (MSC16208)

Day & Date: Sunday, 01-June-2025 Max. Marks:80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) Mode is that value in frequency distribution which possesses _____
a) Minimum frequency
b) Maximum frequency
c) Either minimum or maximum frequency
d) Neither minimum nor maximum frequency

2) The probability of Type-II error is _____
a) P(Reject H_0 when H_0 is true)
b) P(Accept H_0 when H_0 is false)
c) P(Accept H_0 when H_0 is true)
d) P(Reject H_0 when H_0 is false)

3) Which of the following measure is never negative for any data?
a) Mode b) Median
c) Mean d) Range

4) If ranks in each pair are equal then Spearman's rank correlation coefficient is _____
a) -1 b) 0
c) 1 d) None of these

5) Geometric mean of two numbers 1/49 and 4/16 is _____
a) 1/7 b) 1/49
c) 4/9 d) 1 /14

6) In a binomial probability distribution, relation between mean and variance is _____
a) Mean < Variance b) Mean = Variance
c) Mean > Variance d) Difficult to tell

7) The range of Uniform(0,1) is _____
a) +1 to -1 b) -1 to 0
c) 0 to 1 d) None of above

8) For a dataset, the arithmetic mean is 27. If all the values in the data are doubled, then what will be the arithmetic mean of new data?
a) 27 b) 13.5
c) 29 d) 54

9) If the arithmetic mean of two observations is 6.5 and geometric mean is 6 then two observations are _____
a) 9, 6 b) 8, 5
c) 7, 6 d) 4, 9

10) In binomial distribution when n = 1, then it becomes: _____
a) Normal distribution b) Geometric distribution
c) Uniform distribution d) Bernoulli distribution

B) Fill in the blank. **06**

1) If X follows Poisson distribution with parameter 3, then $P(X = 4.3) =$___
2) If correlation coefficient between X and Y is 0.7 then correlation coefficient between Y and X is _____
3) Correlation coefficient is the _____ of two regression coefficients.
4) Level of significance is the probability of _____ error.
5) The observation that lies exactly at the middle of the data is called as ____
6) If X and Y have perfect positive correlation, then Correlation $(X, Y) =$ __

Q.2 Answer the following. **16**

a) Discuss the concept of dispersion in the data.
b) Define type-I and type-II error.
c) Discuss addition and multiplication rules of probability.
d) Define coefficient of variation. Also state its importance.

Q.3 Answer the following. **16**

a) Describe any two measures of central tendency, in detail.
b) Explain-
i) Run test
ii) Signed-rank test

Q.4 Answer the following. **16**

a) Define Probability Mass function. Explain Binomial and Poisson Distributions.
b) What do you mean by testing of hypothesis? State simple and composite hypothesis. Explain the term Test Statistic.

Q.5 Answer the following. **16**

a) Describe -

i) Standard deviation

ii) Quartile deviation

b) Calculate the median value for the following frequency distribution

Class interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	13	15	19	17	11	9

Q.6 Answer the following. **16**

a) Explain Spearman's rank correlation coefficient in details.

b) Define the following -

i) Arithmetic mean

ii) Geometric mean

iii) Harmonic mean

Q.7 Answer the following. **16**

a) Calculate Karl Pearson's coefficient of correlation in the following series relating to prices and supply of a commodity.

Price	11	12	13	14	15	16	17	18	19	20
Supply	30	24	29	30	26	24	25	26	24	22

b) Define Poisson distribution with parameter λ. The probability that there is no misprint in a page of book is 0.15. Find the probability that a page selected at random from this book contains.

i) at most two misprints

ii) exactly two misprints

iii) at least two misprints