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B.Tech. CSE (DS) (Part - II) (Semester - III) (CBCS)
Examination, March - 2023
DISCRETE MATHEMATICS & STRUCTURES
Sub. Code : 83941

Day and Date : Friday, 16 - 06 - 2023

Total Marks: 70

Time : 02.30 p.m. to 05.00 p.m.

- Instructions:
- 1) All questions are compulsory.
 - 2) Assume suitable data wherever necessary.
 - 3) Figures to the right indicate full marks.

Q1) Solve MCQs.

(1 Mark Each)

- i) Which of the following propositions is tautology?
 - a) $(p \vee q) \rightarrow q$
 - b) $p \vee (q \rightarrow p)$
 - c) $p \vee (p \rightarrow q)$
 - d) Both (b) & (c)
- ii) Conjunctive statements is connected by,
 - a) or
 - b) and
 - c) not
 - d) if...then
- iii) $(\sim p \rightarrow Q) \rightarrow (Q \rightarrow P)$ is,
 - a) FTTT
 - b) TTTT
 - c) TTFT
 - d) TFTT
- iv) If f and g are onto then the function (gof) is
 - a) one to one
 - b) onto
 - c) one to many
 - d) into

P.T.O.

- xi) A relation can be represented using a?
- a) Indirected graph
 - b) Pie graph
 - c) Directed graph
 - d) Line graph
- xii) Which of the following involves distinct values i.e. between any two points?
- a) Continuous Mathematics
 - b) Non-Continuous Mathematics
 - c) Non-Discrete Mathematics
 - d) Discrete Mathematics
- xiii) A set which contains a definite number of elements is called
- a) Proper Subset
 - b) Universal Set
 - c) Finite Set
 - d) Unit Set
- xiv) If function is both surjective and injective then it is known as
- a) Invertible
 - b) Composition
 - c) Bijective
 - d) Associative

Q2) Solve any 2 of the following.

(7 Marks Each)

a) Prove that the following statement is tautology

$$P = [(p \vee q) \wedge (p \vee \sim q) \wedge (\sim p \vee q) \wedge (\sim p \vee \sim q)]$$

b) Let p, q, r be the following statements:

p: I will study discrete mathematics

q: I will watch T.V.

r: I am in a good mood.

Write the following statements in terms of p, q, r and logical connectives.

i) If I do not study and I watch T.V., then I am in good mood.

ii) If I am in good mood, then I will study or I will watch T.V.

iii) If I am not in good mood, then I will not watch T.V. or I will study.

iv) I will watch T.V. and I will not study if and only if I am in good mood.

c) If A, B, C are three non empty sets then prove the following -

$$A \times (B \cup C) = (A \times B) \cup (A \times C)$$

Q3) Solve any 2 of the following:

(7 Marks Each)

a) Prove that following statements are logically equivalent

$$p \wedge (q \vee r) = (p \wedge q) \vee (p \wedge r)$$

b) Short note on

i) composition function

ii) inverse function.

c) What are The Types of Sets?

Q4) Solve any 2 of the following:

(7 Marks Each)

- a) What is lattice? What are the types of lattice?
- b) Show that in any Boolean algebra, $(a + b')(b + c')(c + a') = (a' + b)(b' + c)(c' + a)$
- c) Explain the basic concept of graph theory.

Q5) Solve any 2 of the following:

(7 Marks Each)

- a) Define Hasse diagram with example.
- b) Define the following terms (i) Bipartite graphs (ii) Simple and Complete graphs.
- c) With example explain Minimization of Boolean Functions.



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**S.Y. B.Tech. (Computer Science and Engineering) (Data Science)
(Part-II) (Semester - III) (CBCS) Examination, January - 2023**

DISCRETE MATHEMATICAL & STRUCTURES

Sub. Code : 83941

Day and Date : Monday, 23 - 01 - 2023

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :**
- 1) All questions are compulsory.
 - 2) Assume suitable data wherever necessary.
 - 3) Figures to the right indicate full marks.

Q1) Solve MCQs. (1 Marks Each)

- a) Which of the following is/are tautology?
 - i) $a \vee b \rightarrow b \wedge c$
 - ii) $a \wedge b \rightarrow b \vee c$
 - iii) $a \vee b \rightarrow (b \rightarrow c)$
 - iv) None of these
- b) If any of the sentence is true then it is true, otherwise it is false. Then it is,
 - i) Conjunction
 - ii) Negation
 - iii) Disjuncton
 - iv) Ex-or
- c) A _____ is an ordered collection of objects.
 - i) Relation
 - ii) Function
 - iii) Set
 - iv) Proposition
- d) Which of the following two sets are equal?
 - i) $A=\{1, 2\}$ and $B=\{1\}$
 - ii) $A=\{1, 2\}$ and $B=\{1,2, 3\}$
 - iii) $A=\{1, 2, 3\}$ and $B=\{2, 1, 3\}$
 - iv) $A=\{1, 2, 4\}$ and $B=\{1, 2, 3\}$
- e) The complement of the set A is _____
 - i) $A-B$
 - ii) $U-A$
 - iii) $A-U$
 - iv) $B-A$
- f) A graph is a set of points, called?
 - i) Nodes
 - ii) Edge
 - iii) Fields
 - iv) Lines

P.T.O.

Q2) Solve any 2 of the following (7 Marks Each).

- a) What are Connectives? Explain with example.
- b) Show that $p \rightarrow (q \rightarrow r) \Leftrightarrow (p \wedge q) \rightarrow r$ without using truth tables.
- c) Short notes on
 - i) PDNF
 - ii) PCNF

Q3) Solve any 2 of the following (7 Marks Each).

- a) Define the following terms
 - i) onto function
 - ii) one-one function
 - iii) Bijective function
- b) What are the types of relation
- c) Short notes on.
 - i) Duality Principle
 - ii) Set Operations

Q4) Solve any 2 of the following. (7 Marks Each).

- a) Define lattice homomorphism and isomorphism.
- b) What is the hasse diagram explain with example
- c) Short notes on.
 - i) Subgroup
 - ii) Homomorphism

Q5) Solve any 2 of the following (7 Marks Each).

- a) Write short notes on the following.
 - i) Binary trees
 - ii) Spanning trees
- b) In a Boolean algebra prove that $(a \wedge b)' = a' \vee b'$
- c) With example explain Minimization of Boolean Functions



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**S.Y. B.Tech. (Computer Science and Engineering) (Semester - III)
Examination, March - 2023**

DATA STRUCTURES

Sub. Code : 83942

Day and Date : Saturday, 17 - 06 - 2023

Total Marks : 70

Time : 02.30 p.m. to 05.00 p.m.

- Instructions :**
- 1) Attempt all questions are compulsory.
 - 2) Assume suitable data wherever necessary.
 - 3) Figures to the right indicate full marks.

Q1) Solve MCQs (1 marks each) :

- a) What are the advantages of arrays?
 - i) Objects of mixed data types can be stored
 - ii) Elements in an array cannot be sorted
 - iii) Index of first element of an array is 1
 - iv) Easier to store elements of same data type
- b) Syntax to initialize an array in C?
 - i) `int arr[3] = (1, 2, 3);`
 - ii) `int arr(3) = {1, 2, 3};`
 - iii) `int arr[3] = {1, 2, 3};`
 - iv) `int arr(3) = (1, 2, 3);`
- c) Elements in an array are accessed _____
 - i) Randomly
 - ii) Sequentially
 - iii) Exponentially
 - iv) Logarithmically
- d) The number of comparisons done by sequential search is _____
 - i) $(N/2)+1$
 - ii) $(N+1)/2$
 - iii) $(N-1)/2$
 - iv) $(N+2)/2$

P.T.O.

- e) The time complexity of quick sort is
- i) $O(n)$
 - ii) $O(n^2)$
 - iii) $O(n \log n)$
 - iv) $O(\log n)$
- f) In _____, search start at the beginning of the list and check every element in the list.
- i) Linear Search
 - ii) Binary Search
 - iii) Hash Search
 - iv) Binary Tree Search
- g) _____ is not the operation that can be performed on queue
- i) Insertion
 - ii) Deletion
 - iii) Retrieval
 - iv) Traversal
- h) In circular queue the value of r will be
- i) $r = r + 1$
 - ii) $r = (r+1) \% [QUEUE_SIZE - 1]$
 - iii) $r = (r+1) \% QUEUE_SIZE$
 - iv) $r = (r-1) \% QUEUE_SIZE$
- i) The advantage of _____ is that they solve the problem if sequential storage representation. But disadvantage in that is they are sequential lists.
- i) Lists
 - ii) Linked Lists
 - iii) Trees
 - iv) Queues
- j) Which data structure allows deleting data elements from and inserting at rear?
- i) Stacks
 - ii) Queues
 - iii) Dequeues
 - iv) Binary Search Tree
- k) To represent hierarchical relationship between elements, Which data structure is suitable?
- i) Dequeue
 - ii) Priority Queue
 - iii) Tree
 - iv) Graph

- l) _____ is a directed tree in which outdegree of each node is less than or equal to two.
- i) Unary tree
 - ii) Binary tree
 - iii) Trinary tree
 - iv) Both ii) and iii)
- m) A directed graph is _____ if there is a path from each vertex to every other vertex in the digraph.
- i) Weakly Connected
 - ii) Strongly Connected
 - iii) Tightly Connected
 - iv) Linearly Connected
- n) A graph is a collection of nodes, called _____ And line segments called arcs or _____ that connect pair of nodes.
- i) vertices, edges
 - ii) edges, vertices
 - iii) vertices, paths
 - iv) graph node, edges

Q2) Solve any 2 of the following (7 Marks Each) :

- a) What is a Data Structure? Describe the types of Data Structures in detail.
- b) What are the importance of searching and sorting algorithms? Name the different types of searching techniques with example.
- c) Write operations on queue with example.

Q3) Solve any 2 of the following (7 Marks Each) :

- a) List the applications of Data Structure.
- b) Compare Binary Search and Linear Search with example and Write an algorithm for binary search technique.
- c) What are stacks? Explain with example.

Q4) Solve any 2 of the following (7 Marks Each) :

- a) List types of linked list with example and Explain inserting a node in singly linked list at given position.
- b) What are Tree data structures and State different types of trees in data structure.
- c) Explain the term BFS and DFS with example.

Q5) Solve any 2 of the following (7 Marks Each) :

- a) State the algorithm to insert node in doubly linked list in all possible positions.
- b) What is binary search tree? Explain with example.
- c) What is sparse matrix? Explain representation of sparse matrix.



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S.Y.B. Tech. (Computer Science and Engineering) (Part-II)
(Semester - III) (CBCS) Examination, January - 2023

DATA STRUCTURES

Sub. Code : 83942

Day and Date : Wednesday, 25 - 01 - 2023

Total Marks :70

Time :10.30 a.m. to 1.00 p.m.

- Instructions :**
- 1) All questions are compulsory.
 - 2) Assume suitable data wherever necessary.
 - 3) Figure to the right indicate full marks.

Q1) Solve MCQs. (1 Marks each)

[14]

- a) Which if the following is non-linear Data structure?
- i) Stacks
 - ii) List
 - iii) Strings
 - iv) Trees
- b) Assuming int is of 4 bytes, what is the size of int arr [15];?
- i) 15
 - ii) 19
 - iii) 11
 - iv) 60
- c) Elements in an array are accessed_____
- i) Randomly
 - ii) Sequentially
 - iii) Exponentially
 - iv) Logarithmically
- d) In_____ Search start at the beginning of the list and check every element in the list.
- i) Linear search
 - ii) Binary search
 - iii) Hash search
 - iv) Binary tree search

P.T.O.

- e) The time complexity of binary search is
- i) $O(\log n)$
 - ii) $O^2(\log n)$
 - iii) $\log n$
 - iv) None of the above
- f) In general, the binary search method needs no more than _____ comparisons.
- i) $\lceil \log_2 n \rceil - 1$
 - ii) $\lceil \log n \rceil + 1$
 - iii) $\lceil \log_2 n \rceil$
 - iv) $\lceil \log_2 n \rceil + 1$
- g) Which data structure allows deleting data elements from and inserting at rear?
- i) Stacks
 - ii) Queues
 - iii) Dequeues
 - iv) Binary search tree.
- h) _____ is very useful in situation when data have to stored and then retrieved in reverse order.
- i) Stack
 - ii) Queue
 - iii) List
 - iv) Linked list
- i) The advantages of _____ is that they solve the problem if sequential storage representation But disadvantage in that is they are sequential lists.
- i) Lists
 - ii) Linked lists
 - iii) Trees
 - iv) Queues
- j) Which data structure allows deleting data elements from and inserting at rear?
- i) Stacks
 - ii) Queues
 - iii) Dequeues
 - iv) Binary search tree

- k) To represent hierarchical relationship between elements, which data structure is suitable?
- i) Dequeue
 - ii) Priority Queues
 - iii) Tree
 - iv) Graph
- l) _____ is a directed tree in which outdegree of each nodes is less than or equal to two
- i) Unary tree
 - ii) Binary tree
 - iii) Trinary tree
 - iv) Both (ii) and (iii)
- m) A directed graph is _____ if there is a path from each vertex to every other vertex in the digraph.
- i) Weakly connected
 - ii) Strongly connected
 - iii) Tightly connected
 - iv) Linearly connected
- n) A graph is a collection of nodes, called _____ and line segments called arcs or _____ that connect pair of nodes.
- i) Vertices, edges
 - ii) Edges, vertices.
 - iii) Vertices, paths
 - iv) Graph node, edges

Q2) Solve any 2 of the following (7 marks each) [7]

- a) Define terms Time Complexity and space complexity and explain Time-space trade-off.
- b) Compare bubble sort and quick sort with example algorithm.
- c) What are circular queues? Explain the advantages of circular queues over linear queues.

Q3) Solve any 2 of the following (7 Marks each) [7]

- a) Define time and space complexity. Explain various time complexity notations.
- b) Demonstrate selection sort and insertion sort for the input 2,1,3,7,4,5,9,8,6
- c) What are the applications of stacks? Explain with example.

Q4) Solve any 2 of the following (7 marks each) [7]

- a) What is doubly linked lists? Explain operations on doubly linked list.
- b) What is binary search tree? State the difference between binary and binary search tree.
- c) Explain the term BFS and DFS with example.

Q5) Solve any 2 of the following (7 Marks each) [14]

- a) State the algorithm to insert node in doubly linked list in all possible positions.
- b) Demonstrate pre-order, in-order and post-order traversal with example.
- c) What is sparse matrix? Explain representation of sparse matrix.



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**S.Y. B.Tech. (Computer Science and Engineering) (Part - II)
(CBCS) (Semester - III) Examination, March - 2023**

MICROPROCESSORS AND MICROCONTROLLER

Sub. Code : 83944

Day and Date : Tuesday, 20 - 06 - 2023

Total Marks : 70

Time : 02.30 p.m. to 05.00 p.m.

- Instructions :**
- 1) All questions are compulsory.
 - 2) Assume suitable data wherever necessary.
 - 3) Figures to the right indicate full marks.

Q1) Solve MCQs. [1 Each]

- i) Which of the following are the two main components of the CPU?
 - a) Control Unit and Registers
 - b) Registers and Main Memory
 - c) Control unit and ALU
 - d) ALU and bus
- ii) Which of the following are the two main components of the CPU?
 - a) Control Unit and Registers
 - b) Registers and Main Memory
 - c) Control unit and ALU
 - d) ALU and bus
- iii) In 8085 how many interrupts are maskable.
 - a) Two
 - b) Three
 - c) Four
 - d) Five
- iv) 8051 Microcontroller has?
 - a) 8-bit unidirectional address bus
 - b) 16-bit unidirectional address bus
 - c) 8-bit bidirectional address bus
 - d) 16-bit bidirectional address bus
- v) What is the use of the LDR Sensor?
 - a) Monitors Motion
 - b) Monitors air pressure
 - c) Monitors Light Intensity
 - d) Monitors heartbeat
- vi) A sketch is
 - a) an Arduino file
 - b) an Arduino picture
 - c) an Arduino board
 - d) none of above

P.T.O.

- vii) Which of the following is Features of 8051 Microcontroller?
- a) 16-bit program counter and data pointer
 - b) Four 8-bit ports
 - c) Three internal and two external Interrupts
 - d) All of the above
- viii) What is the microcontroller used in Arduino UNO?
- a) AT mega 32114
 - b) AT 91 SAM $3 \times 8E$
 - c) AT mega 2560
 - d) AT mega 328p
- ix) Delay(5000); stands for
- a) Wait 5 minutes
 - b) Wait 5 seconds
 - c) Wait 50 seconds
 - d) None
- x) IC of 7 segment display contains
- a) 4 leds
 - b) 5 leds
 - c) 6 leds
 - d) 7 leds
- xi) Arduino IDE consists of 2 functions. What are they?
- a) Loop() and build() and setup()
 - b) Build() and loop()
 - c) Setup() and build()
 - d) Setup() and loop()
- xii) What language is a typical Arduino code based on?
- a) Assembly Code
 - b) Python
 - c) Java
 - d) C/C++
- xiii) How many pins are present in the LDR Sensor?
- a) 1
 - b) 4
 - c) 2
 - d) 5
- xiv) How many times does the setup() function run on every startup of the Arduino System?
- a) 1
 - b) 2
 - c) 3
 - d) 4

Q2) Solve any two of the following.

[7 Each]

- a) Draw and explain architecture of intel-51, 8-bit Microcontroller.
- b) Explain different types of Interrupts in 8085.
- c) Briefly describe various applications of Arduino

Q3) Solve any two of the following.

[7 Each]

- a) Draw & explain flag register of 8085.
- b) Describe the pin configuration of Arduino Uno.
- c) What are the advantages of Arduino over other micro controllers?

Q4) Solve any two of the following.

[7 Each]

- a) List and Explain component of Raspberry.
- b) Explain the program to blink LED using arduino IDE.
- c) Write the various data types available in embedded C along with their size.

Q5) Solve any two of the following.

[7 Each]

- a) Write short on:-
 - i) Interfacing Input & Output
 - ii) LDR
- b) What is serial communication? Explain types of serial communication.
- c) List and Explain operators in arduino.



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**S.Y.B.Tech. (Computer Science and Engineering) (Data Science)
(Part-II) (Semester - III) (CBCS) Examination, January - 2023
MICROPROCESSORS & MICROCONTROLLER
Sub. Code : 83944**

Day and Date : Monday, 30- 01 - 2023

Total Marks :70

Time :10.30 a.m. to 1.00 p.m.

- Instructions :
- 1) All questions are compulsory.
 - 2) Assume suitable data wherever necessary.
 - 3) Figures to the right indicate full marks.

Q1) Solve MCQs.**[14]**

- a) Which is the microprocessor comprises:
- i) Register section
 - ii) One or more ALU
 - iii) Control unit
 - iv) All of these
- b) There are primarily two types of register:
- i) general purpose register
 - ii) dedicated register
 - iii) (i) and (ii)
 - iv) none of these
- c) BCD stands for :
- i) Binary coded decimal
 - ii) Binary coded decoded
 - iii) Both (i) & (ii)
 - iv) None of these
- d) 8051 series has how many 16 bit registers?
- i) 2
 - ii) 3
 - iii) 1
 - iv) 0
- e) None of the mentioned How many bytes of bit addressable memory is present in 8051 based microcontrollers?
- i) 8 bytes
 - ii) 32 bytes
 - iii) 16 bytes
 - iv) 128 bytes

P.T.O.

- f) What is Arduino?
- i) Programming language
 - ii) Image editing software
 - iii) Open-source electronics platform
 - iv) Text editor
- g) When the microcontroller executes some arithmetic operations, then the flag bits of which register are affected?
- i) PSW
 - ii) SP
 - iii) DPTR
 - iv) PC
- h) If we push data onto the stack then the stack pointer.
- i) Increases with every push
 - ii) Decreases with every push
 - iii) Increases & decreases with every push
 - iv) None of the mentioned
- i) Arduino codes are referred to as _____ in the Arduino IDE.
- i) Sketches
 - ii) Drawings
 - iii) Links
 - iv) Notes
- j) 8051 microcontroller has 4KB bytes on-chip program memory?
- i) TRUE
 - ii) FALSE
 - iii) Can be true or false
 - iv) Can not say
- k) IC of 7 segment display contains.
- i) 4 leds
 - ii) 5 leds
 - iii) 6 leds
 - iv) 7 leds

- l) What is the use of the LDR sensor?
- i) Monitors motion
 - ii) Monitors air pressure
 - iii) Monitors light intensity
 - iv) Monitors nearbeat
- m) What does UART stand for?
- i) Universal asynchronous receiver transmitter
 - ii) Unique asynchronous receiver transmitter
 - iii) Universal address receiver transmitter
 - iv) Unique address receiver transmitter
- n) Dealy (5000); stands for
- i) Wait 5 minutes
 - ii) Wait 5 seconds
 - iii) Wait 50 seconds
 - iv) None

Q2) Solve any 2 of the following (7 marks each) [14]

- a) Draw & Explain architecture of 8085.
- b) Describe the pin configuration of Arduino Uno.
- c) Explain different addressing modes of 8085 microprocessor with examples.

Q3) Solve any 2 of the following (7 marks Each) [2×7=14]

- a) List main feature of 8051 microcontroller.
- b) Explain about Raspberry pi explain with application.
- c) Draw & explain flag register of 8085

Q4) Solve any 2 of the following (7 marks each)**[14]**

- a) List and explain different function used for serial communication.
- b) Write the various data types available in mebedded C along with their size.
- c) Explain difference between Rasberry and Arduino.

Q5) Solve any 2 of the following (7 Marks Each)**[14]**

- a) List & Explain types of variables inArduino.
- b) Write short on :
 - i) Interfacing input & output
 - ii) LDR
- c) Explain various logical operations that can be performed using embed-
ded C statements, also give the example of each.



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**S.Y. B.Tech. (Computer Science and Engineering)
(Data Science) (Part - II) (CBCS) (Semester - IV)
Examination, March - 2023
OPERATING SYSTEM
Sub. Code : 84917**

Day and Date : Wednesday, 21 - 06 - 2023

Total Marks : 70

Time : 10.30 a.m. to 01.00 p.m.

- Instructions :**
- 1) **All questions are compulsory.**
 - 2) **Figures to the right indicate full marks.**
 - 3) **Assume suitable data wherever necessary.**

Q1) Solve MCQs.

[14×1=14]

- i) What is the degree of multiprogramming?
 - a) the number of processes executed per unit time
 - b) the number of processes in the ready queue
 - c) the number of processes in the I/O queue
 - d) the number of processes in memory
- ii) What is an operating system?
 - a) interface between the hardware and application programs
 - b) collection of programs that manages hardware resources
 - c) system service provider to the application programs
 - d) all of the mentioned
- iii) Which one of the following is not true?
 - a) kernel remains in the memory during the entire computer session
 - b) kernel is made of various modules which cannot be loaded in running operating system
 - c) kernel is the first part of the operating system to load into memory during booting
 - d) kernel is the program that constitutes the central core of the operating system

P.T.O.

- iv) A monitor is characterized by _____.
- a) a set of programmer defined operators
 - b) an identifier
 - c) the number of variables in it
 - d) all of the mentioned
- v) Semaphore is a/an _____ to solve the critical section problem.
- a) hardware for a system
 - b) special program for a system
 - c) integer variable
 - d) none of the mentioned
- vi) A Process Control Block (PCB) does not contain which of the following?
- a) Code
 - b) Stack
 - c) Bootstrap program
 - d) Data
- vii) What is Scheduling?
- a) allowing a job to use the processor
 - b) making proper use of processor
 - c) all of the mentioned
 - d) none of the mentioned
- viii) A systematic procedure for moving the CPU to new process is known as
- a) Synchronization
 - b) Starvation
 - c) Context switch
 - d) Deadlock
- ix) 'm' processes share 'n' resources of the same type. The maximum need of each process doesn't exceed 'n' and the sum of all their maximum needs is always less than $m+n$. In this setup, deadlock _____.
- a) can never occur
 - b) may occur
 - c) has to occur
 - d) none of the mentioned
- x) Each request requires that the system consider the _____ to decide whether the current request can be satisfied or must wait to avoid a future possible deadlock.
- a) processes that have previously been in the system
 - b) resources currently available
 - c) resources currently allocated to each process
 - d) future requests and releases of each process

Q4) Solve any two of the following.

[2×7=14]

- a) Name four necessary conditions for Deadlock and explain concept of wait for graph.
- b) Explain concept of static memory allocation and dynamic memory allocation.
- c) Explain file types and file access methods.

Q5) Solve any two of the following.

[2×7=14]

- a) Define Safe and Unsafe Deadlock state with the help of a diagram and explain deadlock avoidance technique (Bankers algorithm).
- b) Consider a reference string: 4,7, 6,1,7, 6,1,2,7,2. the number of frames in the memory is 3. Find out the number of page faults respective to: FIFO Page Replacement Algorithm.
- c) Describe the concept of DMA with neat diagram.

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**S.Y. B.Tech. (Computer Science and Engineering) (Part - II)
(CBCS) (Semester - V) Examination, March - 2023**

SOFTWARE ENGINEERING

Sub. Code : 84918

Day and Date : Saturday, 24 - 06 - 2023

Total Marks : 70

Time : 10.30 a.m. to 01.00 p.m.

- Instructions :**
- 1) All Questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Assume suitable data wherever necessary.

Q1) Solve MCQs.

[14×1=14]

- i) A good specification should be?
 - a) unambiguous
 - b) distinctly specific
 - c) functional
 - d) all of these
- ii) Find out which phase is not available in SDLC?
 - a) Coding
 - b) Testing
 - c) Maintenance
 - d) Abstraction
- iii) In ____ software development model there is no scope for error correction.
 - a) Classical Waterfall
 - b) Iterative Waterfall
 - c) Prototype
 - d) Spiral
- iv) White box testing, a software testing technique is sometimes called?
 - a) Glass box testing
 - b) White glass testing
 - c) Black box
 - d) Basic path
- v) An entity in ER Model is a real world being, which has some properties called _____.
 - a) Attributes
 - b) Relationship
 - c) Domain
 - d) Behaviours
- vi) _____ is set of programs.
 - a) Process
 - b) Designing
 - c) Software
 - d) Analysis

P.T.O.

- vii) _____ determine whether it would be financially and technically possible to develop the product.
- a) Feasibility Study
 - b) Prediction
 - c) Predefined Study
 - d) None of these
- viii) Project risk factor is considered in which model?
- a) Spiral model
 - b) Waterfall model
 - c) Prototype model
 - d) None of above
- ix) A software process model represents which one of the following?
- a) The way in which software is developed
 - b) The way in which software processes data
 - c) The way in which software is used
 - d) The way in which software may fail
- x) A data flow diagram represents which one of the following?
- a) The condition based on which data items may be processed
 - b) The order in which different activities are carried out
 - c) The transformation of data through processing stations
 - d) The order in which various functions of a program are invoked
- xi) Which testing is the re-execution of some subset of tests that have already been conducted to ensure the changes that are not propagated?
- a) Unit testing
 - b) Regression testing
 - c) Integration testing
 - d) Thread-based testing
- xii) In OOD, the attributes (data variables) and methods (operation on the data) are bundled together is called _____.
- a) Classes
 - b) Objects
 - c) Encapsulation
 - d) Inheritance
- xiii) RAD Model has
- a) 2 phases
 - b) 3 phase
 - c) 5 phases
 - d) 6 phases
- xiv) _____ is a software development activity that is not a part of software processes.
- a) Validation
 - b) Specification
 - c) Development
 - d) Dependence

Q2) Solve any two of the following. **[2×7=14]**

- a) What is software requirement specification document? Briefly explain the properties the requirement document should satisfy?
- b) Explain principles of CMM.
- c) Describe Entity Relationship diagrams.

Q3) Solve any two of the following. **[2×7=14]**

- a) Explain Value of good SRS.
- b) Explain relationship between people and efforts.
- c) Draw DFD for ATM System.

Q4) Solve any two of the following. **[2×7=14]**

- a) Write note on :
 - i) UML
 - ii) Object oriented Design
- b) Explain Black box testing.
- c) What is Agile Software Development.

Q5) Solve any two of the following. **[2×7=14]**

- a) Draw and Explain Online shopping Class diagram.
- b) Describe Unit Testing.
- c) Explain SEI capability maturity model.



Q2) Solve any two of the following.

[7 each]

- a) Find the :
- GCD (1025, 35)
 - GCD (807, 481) by using the method of Euclidean algorithm.
- b) For the following data find the regression equation of y on x and hence estimate the value of y when $X = 50$.

x	78	36	98	25	75	85	90	62	65	39
y	84	51	91	60	68	62	86	58	53	47

- c) 5% of the Families in Kolkata do not use gas as a Fuel. If a sample of 50 families are selected at random in Kolkata, what will be the probability that less than 4 Families in the sample do not use gas as a fuel?

Q3) Solve any two of the following.

[7 each]

- a) Solve the following linear congruence equations
- $5x \equiv 48 \pmod{14}$
 - $4x \equiv 10 \pmod{13}$
- b) Number of road accidents- in a highway during a month follows a poisson distribution with mean 5 find probability that in a certain month number of accidents on the highway will be
- Less than 3
 - Between 3 and 5
 - More than 3
- c) Find regression equation of y on x by the method of least square.

x	2	5	8	10	12	6	9	4	15	14	20	18
y	10	12	15	20	18	6	8	10	12	16	8	14

Q4) Solve any two of the following.

[7 each]

- a) A random Sample of 35 airfare prices (in dollars) for a one-way ticket from Atlanta to Chicago. Find a point estimate for the population mean, population standard deviation and population standard Error

99, 102, 105, 104, 95, 105, 100, 114, 108, 103, 94, 105, 101, 109, 103, 98, 96, 98, 104, 87, 101, 106, 103, 90, 107, 98, 101, 107, 105, 94, 111, 104, 87, 117, 101.

- b) The viscosity of aircraft primer paint in a different batches of production varies according to $N(\mu, \sigma^2)$ distribution. Following is the distribution of batches of production according to viscosity (x) reading;

x	20-40	40-60	60-80	80-100	100-120	120-140	140-160	160-180
f	1	5	17	12	6	3	2	2

- c) The School of International studies for population found out by its survey that the mobility of a population of a state to the village, town and city is in the following percentages.

		To		
		Village	Town	City
From	Village	0.50	0.30	0.20
	Town	0.10	0.70	0.20
	City	0.10	0.40	0.50

What will be the proportion of population in village, town and city after two years given that the present population has proportion at 0.7, 0.2 and 0.1 in the village, town and city respectively?

Q5) Solve any two of the following. [7 each]

- a) Three boys A, B and C are throwing a ball to each other. A always throws the ball to B and B always throws the ball to C. but C is as likely to throw the ball to B as to A. If the initial probability distribution of three states A,B, and C is 0.3,0.4 and 0.3 respectively. Find :
- TPM
 - $P(X_2 = B)$
 - $P(X_3 = B, X_2 = C, X_1 = B, X_0 = A)$
- b) A random sample of 100 farms in a certain year gives an average yield of Barley of 2100 lbs. per acre. A random sample of 100 farms in the following years given an average yield of 2000 lbs. per acre. The S.D. for two populations are 224 and 192 respectively. Compute 95% C.I. for the difference between two population means. Assuming data follows normal distribution. [Use:- $Z_{\alpha/2} = 96$]
- c) An automatic soft drink machine is adjusted to fill 200 millilitre with a standard deviation is 15 millilitre. Periodically machine is checked for its performance. It is said to be working properly, if the sample mean at Soft drink dispensed on 36 occasions is in the interval (195, 205). Using central limit theorem. Find the probability that the machine is working properly. [Area under the S.N.D. $Z = 0$ to $2 = 0.4772$]



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S.Y.B.Tech. (CSE) (Data Science) (Part-II) (Semester - III) (CBCS)

Examination, March - 2023

APPLIED MATHEMATICS

Sub. Code : 83940

Day and Date : Thursday, 15 - 06 - 2023

Total Marks : 70

Time : 2:30 p.m. to 5.00 p.m.

- Instructions :**
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Use non-programmable calculator is allowed.

Q1) Solve MCQs (1 Mark each)

[14]

a) Least square fit for straight line $y=ax+b$ to the data is

$$x \quad 1 \quad 2 \quad 3$$

$$y \quad 5 \quad 7 \quad 9$$

i) $y = 2x + 4$

ii) $y = 2x - 3$

iii) $y = 2x + 3$

iv) $y = 3x - 4$

b) Least square fit for the curve $y=ax^b$ to the data is

$$x \quad 1 \quad 2 \quad 3$$

$$y \quad 2 \quad 16 \quad 54$$

i) $y = 2x^3$

ii) $y = 2x^2$

iii) $y = 3x^2$

iv) $y = 4x^3$

c) If the regression coefficient of X on Y and Y on X are -0.5 and -0.5 respectively then the correlation coefficient between X and Y is

i) 1

ii) 0.5

iii) -0.5

iv) -1

P.T.O.

Q2) Solve any two of the following:

- a) Find the regression lines of given data.

x:	1	2	3	4	5	6	7	8	9	10
y:	10	12	16	28	25	36	41	49	40	50

- b) If x is random variable with distribution given below.

X	1	2	3	4	5	6	7
P(x)	K	2K	3K	K ²	K ² +k	2K ²	4K ²

Then find the value of a) k, b) P(x<5), c) P(x>5)

- c) Find the value of $\int_0^1 \frac{1}{1+x} dx$ by

i) Trapezoidal rule

ii) Simpson's $\frac{1}{3}$ rd rule

iii) Simpson's $\left(\frac{3}{8}\right)^{th}$ rule

Q3) Solve any two of the following:

- a) Fit a curve $y = ax^b$ to the following data.

x =	1	2	3	4	5	6
y =	1200	900	600	200	110	50

- b) If 10% of bolts produced by a machine are defective. Determine the probability that out of 10 bolts, chosen at random,

i) Exactly one

ii) None

iii) At most 1 bolt will be defective.

c)

X	0	0.25	0.5	0.75	1.0
Y	0	0.06153	0.02222	0.3956	0.5

By using above table Trapezoidal Rule an Simpsons one third rule, find

the value of integral $\int_0^1 \frac{x^2}{1+x^3} dx$

Q4) Solve any two of the following.

[14]

a) If $A(x) = \frac{x}{x+1}$ & $B(x) = 1 - \frac{x}{10}$, for $x \in \{0,1,2,\dots,10\}$

then $S(A,B)$ and $S(B,A) = \dots\dots\dots$

b) Solve the fuzzy equation $AX=B$ if A and B are fuzzy numbers whose membership function is given by

$$A(x) = \begin{cases} \frac{x}{2} - 1 & \text{for } 2 < x \leq 4 \\ 3 - \frac{x}{2} & \text{for } 4 \leq x < 6, \\ 0 & \text{otherwise} \end{cases} \quad B(x) = \begin{cases} \frac{x}{2} - 3 & \text{for } 6 < x \leq 8 \\ 5 - \frac{x}{2} & \text{for } 8 \leq x < 10 \\ 0 & \text{otherwise} \end{cases}$$

c) To solve the assignment problem and find minimum cost. There are four jobs to be assigned, one each to four machines and the cost matrix is

Jobs	Machine			
	1	2	3	4
A	17	40	36	24
B	26	35	13	39
C	49	28	37	24
D	38	36	37	19

Q5) Solve Any Two of the following.

- a) If the fuzzy sets A & B are defined by the following membership function

$$A = \frac{0.1}{x_1} + \frac{0.6}{x_2} + \frac{0.8}{x_3} + \frac{0.9}{x_4} + \frac{0.7}{x_5} + \frac{0.1}{x_6} \quad \text{and}$$

$$B = \frac{0.9}{x_1} + \frac{0.7}{x_2} + \frac{0.5}{x_3} + \frac{0.2}{x_4} + \frac{0.1}{x_5} + \frac{0}{x_6}$$

Then find

(1) \bar{A} (2) \bar{B} (3) $\bar{A} \cap B$ (4) $A \cup \bar{B}$

- b) Solve the equation $A+X=B$ where

$$A = \frac{0.2}{[0,1)} + \frac{0.6}{[1,2)} + \frac{0.8}{[2,3)} + \frac{0.9}{[3,4)} + \frac{1}{4} + \frac{0.5}{(4,5]} + \frac{0.1}{(5,6]}$$

$$B = \frac{0.1}{[0,1)} + \frac{0.2}{[1,2)} + \frac{0.6}{[2,3)} + \frac{0.7}{[3,4)} + \frac{0.8}{[4,5]} + \frac{0.9}{[5,6)} + \frac{1}{6} +$$

$$\frac{0.5}{(6,7]} + \frac{0.4}{(7,8]} + \frac{0.2}{(8,9]} + \frac{0.1}{(9,10]}$$

- c) To solve the assignment problem and find minimum cost. There are four jobs to be assigned, one each to four machines and the cost matrix is

jobs	Machine			
	1	2	3	4
A	18	14	18	20
B	21	15	15	16
C	17	20	13	18
D	21	18	14	24



Seat No.	
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B. Tech. (CSE) (Data Science and Engineering) (Part - II)
(Semester - IV) (CBCS) Examination, March - 2023
AUTOMATA THEORY
Sub. Code : 84914

Day and Date : Thursday, 15 - 06 - 2023

Total Marks : 70

Time: 10.30 a.m. to 1.00 p.m.

- Instructions :**
- 1) All questions are compulsory.
 - 2) Assume suitable data wherever necessary.
 - 3) Figures to the right indicate full marks.

Q1) Solve MCQs. (1 Mark Each)

- a) Transition function maps.
 - i) $\Sigma * Q \rightarrow \Sigma$
 - ii) $Q * Q \rightarrow \Sigma$
 - iii) $\Sigma * \Sigma \rightarrow Q$
 - iv) $Q * \Sigma \rightarrow Q$
- b) There are _____ tuples in finite state machine.
 - i) 4
 - ii) 5
 - iii) 6
 - iv) unlimited
- c) The Grammar can be defined as: $G=(V, \Sigma, p, S)$ In the given definition, what does S represents?
 - i) Accepting State
 - ii) Starting Variable
 - iii) Sensitive Grammar
 - iv) None of these
- d) The language accepted by Push down Automation:
 - i) Recursive Language
 - ii) Context free language
 - iii) Linearly Bounded language
 - iv) All of the mentioned
- e) Which among the following is the root of the parse tree?
 - i) Production P
 - ii) Terminal T
 - iii) Variable V
 - iv) Starting Variable S

P.T.O.

- f) CFG stands for _____
- i) Context Free Graph ii) Context Free Grammar
 iii) Context Finite Graph iv) Context Finite Grammar
- g) A grammar with more than one parse tree is called:
- i) Unambiguous
 ii) Ambiguous
 iii) Regular
 iv) None of the mentioned
- h) The terminals are designated by _____ letters, while the non-terminals are designated by _____ letters.
- i) Capital, bold ii) Small, capital
 iii) Capital, small iv) Small, bold
- i) The productions of the form nonterminal \rightarrow one nonterminal, is called _____
- i) Null production ii) Unit production
 iii) Null able production iv) None of given
- j) Simplify the given grammar: Removal of null productions $S \rightarrow aXb$
 $X \rightarrow aXb \mid \epsilon$
- i) $S \rightarrow aXb \mid ab, X \rightarrow aXb \mid ab$ ii) $S \rightarrow X \mid ab, X \rightarrow aXb \mid ab$
 iii) $S \rightarrow aXb \mid ab, X \rightarrow S \mid ab$ iv) None of the mentioned
- k) A push down automation employs _____ data structure.
- i) Queue ii) Linked List
 iii) Hash Table iv) Stack
- l) Which of the following are the models equivalent to Turing machine?
- i) Multi tape turing machine ii) Multi track turing machine
 iii) Register machine iv) All of the mentioned
- m) Which of the following is the format of unit production?
- i) $A \rightarrow B$ ii) $A \rightarrow b$
 iii) $B \rightarrow Aa$ iv) None of the mentioned
- n) If L_1 and L_2 are regular sets then intersection of these two will be
- i) Regular ii) Non Regular
 iii) Recursive iv) Non Recursive

Q2) Solve any 2 of the following (7 Marks Each)

- Define Alphabet, String & Language with an example each.
- Construct a finite automation for the regular expression $(0+1)^*$
- Explain Recursive definition and Defining the language palindrome, defined over $\Sigma = \{a,b\}$.

Q3) Solve any 2 of the following (7 Marks Each)

- Explain about derivation and parse tree? Construct the string 0100110 from the leftmost and Rightmost derivation.

$S \rightarrow 0S/1AA$

$A \rightarrow 0/1A/0B$

$B \rightarrow 1/0BB$

- Explain with an example NFA with null transition.
- Convert the following grammar into CNF.

$S \rightarrow bA/aB$

$A \rightarrow bAA/aS/a$

$B \rightarrow aBB/bS/a$.

Q4) Solve any 2 of the following (7 Marks Each)

- short note on:
 - Top down parsing,
 - bottom up parsing
- Construct a PDA which recognizes all strings that contain equal number of 0's and 1's.
- Define Turing Machine Model. Explain the representation of Turing Machines.

Q5) Solve any 2 of the following (7 Marks Each)

- Explain the various types of Turing machine.
- State Pumping lemma for Context free language.
- Construct a Turing machine which multiplies two unary numbers.



Seat No.	
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**S.Y. B.Tech. (CSE (Data Science)) (Part - II) (CBCS)
(Semester - III) Examination, March - 2023**

COMPUTER NETWORKS

Sub. Code : 83943

Day and Date : Monday, 19 - 06 - 2023

Total Marks : 70

Time : 02.30 p.m. to 05.00 p.m.

- Instructions :**
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Assume suitable data wherever necessary.

Q1) Solve MCQs. [1 Each]

- a) How many bits internet address is assigned to each host on a TCP/IP internet which is used in all communications with the host ?
- i) 16 bits
 - ii) 32bit
 - iii) 48 bits
 - iv) 64 bits
- b) The main function of transport layer is
- i) Node-to-node delivery
 - ii) Process-to-process delivery
 - iii) Synchronization
 - iv) Updating and maintenance of routing tables
- c) The Media Access Control Sublayer resides in which OSI layer
- i) Transport
 - ii) Network
 - iii) Physical
 - iv) Data Link
- d) ARQ stands for
- i) Automatic repeat quantization
 - ii) Automatic repeat request
 - iii) Automatic retransmission request
 - iv) Acknowledge repeat request

P.T.O.

- e) CRC stands for _____.
- i) cyclic redundancy check
 - ii) code repeat check
 - iii) code redundancy check
 - iv) cyclic repeat check
- f) Which error detection method involves polynomials?
- i) CRC
 - ii) Simple parity check
 - iii) Two dimensional parity check
 - iv) Checksum
- g) In _____ methods, no station is superior to another station and none is assigned the control over another
- i) random access
 - ii) controlled access
 - iii) channelization
 - iv) none of the above
- h) In _____, each station is allocated a band to send its data. In other words, each band is reserved for a specific station, and it belongs to the station all the time.
- i) FDMA
 - ii) TDMA
 - iii) CDMA
 - iv) none of the above
- i) In congestion control, policies are applied to prevent congestion before it happens
- i) open loop
 - ii) closed loop
 - iii) Either (i) and (ii)
 - iv) Neither (i) and (ii)
- j) In _____, each node maintains a vector (table) of minimum distances to every node.
- i) path vector
 - ii) distance vector
 - iii) link state
 - iv) none of the above
- k. Which one of the following source needs to pass information to all routers visited by datagram, the option used in
- i) IP-by-IP option
 - ii) Header-by-Header option
 - iii) Hop-by-Hop Option
 - iv) Loop-by-loop Option
- l) IGMP is _____ protocol.
- i) an error reporting
 - ii) an error reporting
 - iii) a transmission
 - iv) none of the above

- m) Return value of the UDP port "Chargen" is
 - i) String of characters
 - ii) String of integers
 - iii) Array of characters with integers
 - iv) Array of zero' s and one' s
- n) Which is the correct expression for the length of UDP datagram
 - i) $\text{UDP length} = \text{IP length} - \text{IP header's length}$
 - ii) $\text{UDP length} = \text{UDP length} - \text{UDP header's length}$
 - iii) $\text{UDP length} = \text{IP length} + \text{IP header's length}$
 - iv) $\text{UDP length} = \text{UDP length} + \text{UDP header's length}$

Q2) Solve any two of the following. [7 Each]

- a) Outline TCP/IP Reference model and explain the each layer in detail
- b) List and explain the design Issues of the Data Link Layer.
- c) Explain the Dynamic Channel Allocation and List the different Multiple Access Protocols.

Q3) Solve any two of the following [7 Each]

- a) Compare between topologies.
- b) List and Explain the services provided by Data Link Layer to Network Layer.
- c) What is random access protocol? List the random-access protocol

Q4) Solve any two of the following. [7 Each]

- a) Discuss the design issues of Network Layer.
- b) Draw and explain IP datagram format.
- c) Draw and explain user datagram format.

Q5) Solve any two of the following. [7 Each]

- a) Define routing. Discuss the Properties of good Routing Algorithm, List the category of routing protocols.
- b) Explain in brief Fragmentation.
- c) Explain UDP services.



Seat No.	
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S.Y.B.Tech. (CSE) (Data Science) (Part-II) (Semester - III)
(CBCS) Examination, January - 2023
COMPUTER NETWORK
Sub. Code : 83943

Day and Date : Saturday, 28 - 01 - 2023

Total Marks :70

Time :10.30 a.m. to 1.00 p.m.

- Instructions :
- 1) All questions are compulsory.
 - 2) Assume suitable data wherever necessary.
 - 3) Figures to the right indicate full marks.

Q1) Solve MCQs.**[14]**

- a) With which of the following characteristic, the design issue of a physical layer does not deal.
- i) Mechanical
 - ii) Electrical
 - iii) Functional
 - iv) None of the above
- b) In OSI model, which of the following layer provides errors-free delivery of data
- i) Network layer
 - ii) Transport layer
 - iii) Session layer
 - iv) Data link Layer
- c) Two networks and transport-layer protocols commonly used on internet are
- i) TCP and SPX
 - ii) TCP and IP
 - iii) RIP and NLS
 - iv) None of the above
- d) CRC stands for _____
- i) Cyclic redundancy check
 - ii) Code repeat check
 - iii) Code redundancy check
 - iv) Cyclic repeat check

P.T.O.

- e) ARQ stands for:
- i) Automatic repeat quantization.
 - ii) Automatic repeat request
 - iii) Automatic retransmission request
 - iv) Acknowledge repeat request
- f) Automatic repeat request error management mechanism is provided by
- i) Logical link control sublayer
 - ii) Media access control sublayer
 - iii) Network interface control sublayer
 - iv) Application access control sublayer
- g) In the method a station that has a frame to send senses the line. If the line is idle, it sends immediately. If the line is not idle, it waits a random amount of time and then senses the line again.
- i) Nonpersistent
 - ii) 1-persistent
 - iii) p-persistent
 - iv) None of the above
- h) The vulnerable time for CSMA is the _____ propagation time
- i) the same as
 - ii) two times
 - iii) three times
 - iv) none of the above
- i) What is the first address of a block of classless addresses if one of the addresses is 12.2.127/28?
- i) 12.2.2.0
 - ii) 12.2.2.96
 - iii) 12.2.2.112
 - iv) none of the above
- j) What is the default mask for class B in CIDR notation?
- i) /9
 - ii) /8
 - iii) /16
 - iv) none of the above

- k) Fragmentation of a datagram is necessary only in a _____
- i) Datagram-based network
 - ii) Virtual circuit network
 - iii) Both (i) and (ii) are true
 - iv) None of the above
- l) Internet control Message protocol (ICMP) has been designed to compensate _____
- i) Error-reporting
 - ii) Error-correction
 - iii) Host and management queries
 - iv) All of the mentioned
- m) _____ control refers to methods of errors detection and correction
- i) Flow
 - ii) Error
 - iii) Transmission
 - iv) None of the above
- n) Beyond IP, UDP provides additional services such as _____
- i) Routing and switching.
 - ii) Sending and receiving of packets
 - iii) Multiplexing and demultiplexing
 - iv) Demultiplexing and error checking.

Q2) Solve any 2 of the following (7 marks each) [14]

- a) What is hybrid topology, Explain with example?
- b) Explain the character stuffing with suitable example.
- c) Explain CSMA along with 1- persistent CSMA, Non persistent CSMA and P-persistent CSMA.

Q3) Solve any 2 of the following (7 marks each.) [14]

- a) Differentiate between OSI and TCP/IP reference model.
- b) Draw the Binary Encoding. Manchester encoding. Differential Manchester encoding for given data 101100010
- c) Explain the CSMA with collision detection (CSMA/CD) along with algorithm.

Q4) Solve any 2 of the following (7 marks each). **[14]**

- a) Differentiate between flooding and routing.
- b) Explain IGMP message.
- c) Explain error control in TCP.

Q5) Solve any 2 of the following (7 marks each). **[14]**

- a) Explain and illustrates the working of leaky Bucket algorithm
- b) Draw and explain IP datagram format.
- c) Note on
 - i) TCP timers
 - ii) Socket system calls



Seat No.	
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S.Y. B.Tech. (CSE) (Data Science) (Semester - IV)
(CBCS) Examination, March - 2023
COMPUTER NETWORK PROTOCOLS
Sub. Code : 84915

Day and Date : Saturday, 17 - 06 - 2023

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :**
- 1) All questions are compulsory.
 - 2) Assume suitable data wherever necessary.
 - 3) Figures to the right indicate full marks.

Q1) Solve MCQs. (1 Marks Each)

[14×1=14]

- a) In Socket data structure, IF_INET field used to indicate _____?
 - i) IPv6
 - ii) Ipv4
 - iii) Dotted decimal notation
 - iv) None of these
- b) Purpose of Bind () function is _____.
 - i) To create new socket
 - ii) To assign IP address and Local port
 - iii) To receive data
 - iv) To send data
- c) At server side, sendto() function is used to _____.
 - i) Send request
 - ii) Send response
 - iii) Send acknowledge
 - iv) None of these
- d) Ipv6 does not use _____ type of address
 - i) broadcast
 - ii) multicast
 - iii) anycast
 - iv) unicast
- e) The header length of an Ipv6 datagram is _____.
 - i) 10-bytes
 - ii) 25-bytes
 - iii) 30-bytes
 - iv) 40-bytes
- f) In Ipv6, Traffic class is also called as _____.
 - i) Set class
 - ii) Management class
 - iii) Priority class
 - iv) None of these

P.T.O.

- g) A DNS client is called _____
- i) DNS updater
 - ii) DNS resolver
 - iii) DNS handler
 - iv) None of the mentioned
- h) Servers handle requests for other domains _____
- i) Directly
 - ii) By contacting remote DNS server
 - iii) It is not possible
 - iv) None of the mentioned
- i) Which operating mode of telnet is full duplex?
- i) default mode
 - ii) server mode
 - iii) line mode
 - iv) character mode
- j) If we want that a character be interpreted by the client instead of server _____
- i) interpret as command (IAC) escape character has to be used
 - ii) control functions has to be disabled
 - iii) it is not possible
 - iv) cli character has to be used
- k) HTTP uses the services of _____ on well - known port 80
- i) UDP
 - ii) IP
 - iii) TCP
 - iv) None of the above
- l) The default connection type used by HTTP is _____
- i) Persistent
 - ii) Non-persistent
 - iii) Can be either persistent or non-persistent depending on connection Request
 - iv) None of the mentioned
- m) The delay that occur during the playback of a stream is called
- i) Stream delay
 - ii) Playback delay
 - iii) Jitter
 - iv) Event delay
- n) Real time streaming protocol is used
- i) To control streaming media servers
 - ii) For establishing and controlling media sessions between endpoints
 - iii) To provide real time control of playback of media files from the server
 - iv) All of the mentioned

Q2) Solve any 2 of the following (7 Marks Each).

[2×7=14]

- a) Explain in detail about Concurrent and Iterative server in detail.
- b) Explain Embedding of IPv4 addresses in IPv6 addresses.
- c) What is DNS? What is the need of it? Explain the types of records in DNS.

Q3) Solve any 2 of the following (7 Marks Each).

[2×7=14]

- a) Explain in detail multiprotocol server and multiprocess server.
- b) Write a short note on ICMPv6.
- c) Explain BOOTP protocol in detail.

Q4) Solve any 2 of the following (7 Marks Each).

[2×7=14]

- a) Explain FTP command processing. List and describe at least two commands from each group of FTP commands.
- b) Write note on MIME.
- c) Explain Session Initiation Protocol in detail. Also Explain mechanism of SIP to track the callee.

Q5) Solve any 2 of the following (7 Marks Each).

[2×7=14]

- a) Define TELNET protocol and show how it implements local and remote login using the concept of network virtual terminal.
- b) With neat and labeled diagram Explain HTTP architecture.
- c) Explain is RTP and RTCP? Why does RTP need the service of another protocol, RTCP?

