AJML

QP Code: 4842QP

Seat No.	

Total No. of Pages: 2

Summer Examination March - 2023

Subject Name: B.Tech. CBCS_86161_86161 - Discrete Mathematical Structures_16.06.2023_02.30 PM To 05.00 PM

Subject Code: 86161

Day and Date: - Friday, 16-06-2023
Time: - 02:30 pm to 05:00 pm

Total Marks: 70

Instructions.:

1) All questions are compulsory
2) Figures to the right indicate full marks
3) Assume suitable data wherever necessary and mention it boldly

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Q.1. a) Given A = {2, 3, 4}, B= {1, 2}, and C= {4, 5, 6}, Find A+B and B+C. (7 Marks) [15]

b) Give the definitions of the following with one example each. (8 Marks)

i) Set Theory
ii) Equal Set
iii) Super Set
iv) Proper Set

Q.2. a) Obtain PCNF and PDNF of the following without constructing a truth table:(8 Marks) [15]

i) (P^Q) ˇ (P ^R)

b) Determine whether conclusion C follows logically from premises H1 and H2.(7 Marks)

i) H1: P H2: P<=>Q C: (P^Q)

Q.3. a) What is monoid homomorphism and explain with an example. (7 Marks) [15]

b) Define preorder, inorder and postorder traversal with examples. (8 Marks)

Q.4. a) Explain the types of the matrix representation of Graph. (8 Marks) [15]

OR

b) Let X = {1,2,3,4,6,9} and the relation ≤ be such that x ≤ y if x divides y. Draw the Hasse diagram of (X, ≤). Also, define what is POSET? (8 Marks)

a) Explain the properties of relation with examples. (7 Marks)

OR

b) Explain PERT and related techniques with an example. (7 Marks)

Q.5. Solve any 10 MCQs (1 Mark each) [10]

A. Which of the following is a subset of set {1, 2, 3, 4}?

a) {1, 2} b){1, 2, 3}
c) {1} d)All of the mentioned

B. The intersection of the sets {1, 2, 8, 9, 10, and 5} and {1, 2, 6, 10, 12, 15} is the...

a) {1, 2, 10} b) {5, 6, 12, 15}
c) {2, 5, 10, 9} d) {1, 6, 12, 9, 8}

C. The symbolization for conjunction is...

a) p ^ q b) p & q
c) p v q d) ~ p

D. Which of the following statement is a proposition_____.

a) Close the door b) God bless you
c) What is the time now? d) India is a country

E. Canonical forms for a boolean expression have _____ types.

a) Three types b) Two types
c) Four types d) Five types

F. A graph is a collection of:

a) Row and columns b) Vertices and edges
c) Equations d) None of these

G. A connected Graph T without any cycle is called:

a) Free graph b) No cycle
c) Non-cycle graph d) Circular graph

H. Boolean algebra deals with how many discrete values.

a) only four b)only five
c) only three d) only two

I. Which of the following function is also referred to as an injective function?

a)Many-to-one b)Onto
c) One-to-One d)None of the mentioned

J. The function (gof) is _____ if the functions f and g are onto function?

a)Into function b) one-to-one function
c)onto function d)one-to-many function

K. In the group G = {2, 4, 6, 8) under multiplication modulo 10, the identity element is....

a) 6 b)8
c)4 d)2

L. What's the name of this law a*a=a a⊕a= a.

a) Identity b) Inverse element
c) associative d)Idempotent law

AZM2

QP Code: 5028QP

Seat No.	

Total No. of Pages: 2

Summer Examination March - 2023

Subject Name: B.Tech. CBCS_86162_86162 - Data Structures using C_17.06.2023_02.30 PM To 05.00 PM

Subject Code: 86162

Day and Date: - Saturday, 17-06-2023
Time: - 02:30 pm to 05:00 pm

Total Marks: 70

Instructions.:

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

Q.1. a) Explain the basic structure of a C program with an example (8 Marks) [15]

b) List all conditional control statements used in C. Explain any two with syntax and example (7 Marks)

Q.2. a) Differentiate between array and structures (8 Marks) [15]

b) What is function? Explain its working with example (7 Marks)

Q.3. a) What is sorting technique? Explain any one sorting algorithm (8 Marks) [15]

b) Describe singly linked list and explain insertion operation (7 Marks)

Q.4. a) Describe working of insertion at specified position in array with algorithm (8 Marks) [15]

OR

a) Write short note on(4*2=8)
1. Priority Queue (4M) 2. Recursive algorithm for In-order traversal of binary tree (4M) (8 Marks)

b) Write a C program to implement operations on stack(7 Marks)

OR

b) Explain structure of B Tree (7 Marks)

Q.5. Solve any 10 MCQs (Each 1 Mark) [10]

A. The condition _____ indicate the queue is empty.
a) Front=Null b) Null=Front c) Front=Rear= -1 d) Rear=Null

B. How is an array initialized in C language?
a) int a[2]={3,5,6} b) int a={1,2,3} c) int a(3)={1,2,3} d) int a()={1,2,3}

C.Which of the following is not a valid C variable name?
a) int number b)float Rate c) int variable_count d) int $main

D. What is #include <stdio.h>?
a) Preprocessor directive b) Inclusion directives c) File inclusion directives d) None of these

E. The process of inserting an element in the stack is called?
a) Enqueue b) Insert c) Push d) Pop

F. Which of the following is not the type of queue?
a) Ordinary queue b) Special queue c) Priority queue d) Circular queue

G. The best case time complexity of quick sort is .....
a) O(n) b) O(logn) c) O(n^2) d) O(n logn)

H. A list which displays the relationship of adjacency between elements is said to be
a) linear b) non linear c) linked list d) trees

I. A binary tree whose every node has either zero or two children is called .....
a) complete binary tree b) binary search tree c) extended binary tree d) structure

J. What is the worst case complexity of bubble sort?
a) O(nlogn) b) O(logn) c) O(n) d) O(n^2)

K. A terminal node in a binary tree is called .....
a) Root b) Leaf c) Child d) Branch

L . ..... form of access is used to add and remove nodes from a queue.
a) LIFO, Last In First Out b) FIFO, First In First Out c) Both a and b d) None of these

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Seat No.	

QP Code: 5738QP

Total No. of Pages: 1

Summer Examination March - 2023

Subject Name: B.Tech. CBCS_86168_86168 - Fundamentals of AI_17.06.2023_10.30 AM To 01.00 PM

Subject Code: 86168

Day and Date: - Saturday, 17-06-2023
Time: - 10:30 am to 01:00 pm

Total Marks: 70

Instructions.:

1) All questions are compulsory
2) Figures to the right indicate full marks
3) Assume suitable data wherever necessary and mention it boldly

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Q.1. a)Enlist and describe different applications of artificial intelligence (8M) **[15]**
b)Describe algorithm for best first search with example (7M)

Q.2. a) Illustrate the concept Propositional Logic (8M) **[15]**
b) Design & Explain Heuristic Function with example (8-Puzzle Problem) (7M)

Q.3. a)What is expert system. Explain with architectural diagram (8M) **[15]**
b)What is knowledge? Describe issues in knowledge presentation (7M)

Q.4. a) Describe forward chaining with example. (8M) **[15]**

OR

a) Explain Bayesian reasoning in detail. (8M)

b)Briefly describe game tree with example of Tic-Tac -Toe . (7M)

OR

b)What are likelihood of sufficiency and likelihood of necessity? How does expert system determine values of LS and LN? (7M)

Q.5. Write a short note on: (Any 2) **[10]**

a) Informed search (5M)
b) Artificial Agent (5M)
c) Sources of uncertain knowledge in expert system. (5M)

AJM2

Seat No.	

QP Code: 5652QP

Total No. of Pages: 2

Summer Examination March - 2023

Subject Name: B.Tech. CBCS_86167_86167 - Automata Theory_15.06.2023_10.30 AM To 01.00 PM

Subject Code: 86167

Day and Date: - Thursday, 15-06-2023

Time: - 10:30 am to 01:00 pm

Total Marks: 70

Instructions.:

1) All questions are compulsory
2) Figures to the right indicate full marks
3) Assume suitable data wherever necessary and mention it boldly

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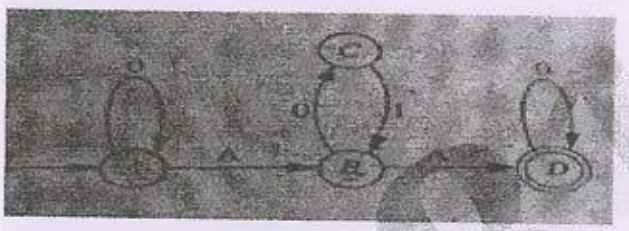
Q.1. a) Write down the difference between DFA and NFA. (8 Marks) [15]

b) Convert NFA-Λ to an NFA and an FA for {0}* {01}*{0}* .(7 Marks)

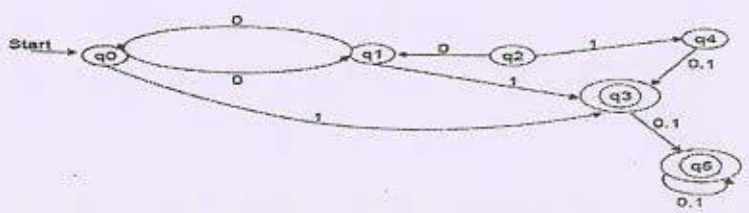


Q.2. a) Convert the given Context free grammar to Chomsky Normal Form : (8 Marks) [15]

S --> AACD
A -->aAb|Λ
C-->aC|a
D -->aDa|bDb|Λ

b) Explain the Pumping Lemma for Context free language.(7 Marks)

Q.3. a) Minimize the FA: (8 Marks) [15]



b) Explain the Grammar and also its types.(7 Marks)

Q.4. a) Construct Turing Machine for-(8 Marks) [15]

i) Accept odd palindrome over {a,b}

ii) Accept {a, b}*{aba}

or

a) Define Pushdown automata. Densign PDA for given language with transition table- L= {0^n1^2n, where n>0}(8 Marks)

b) Difference between Top down and bottom up Parsing.(7 Marks)

or

b) A grammar G with the production rule: (7 Marks)

1. E → I
2. E → E + E
3. E → E * E
4. E → (E)
5. I → ε | 0 | 1 | 2 | ... | 9 For string "3 * 2 + 5" grammar is ambiguous or unambiguous.

Q.5. Write a short note on any two :(5 Marks each) [10]

i) Multi-tape Turing machine.

ii) Universal Turing machine.

iii) Markov Chains problem

(1)

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QP Code: 5201QP

Seat No.	

Total No. of Pages: 2

Summer Examination March - 2023

Subject Name: B.Tech. CBCS_86164_86164 - Computer Organization and Architecture_20.06.2023_02.30 PM To 05.00 PM

Subject Code: 86164

Day and Date: - Tuesday, 20-06-2023
Time: - 02:30 pm to 05:00 pm

Total Marks: 70

Instructions.:

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

Q.1. a. Explain 3rd & 4th generations of computers.(8 Marks) **[15]**
b. Differentiate between RISC & CISC.(7 Marks)

Q.2. a. Draw & explain Carry Lookahead adder.(8 Marks) **[15]**
b. Describe the concept of DMA with the help of DMA Controller.(7 Marks)

Q.3. a. What is floating point number? Explain IEEE 754 floating point format of the following number: 2 (8 Marks) **[15]**
b. Differentiate between Hardwired Control & Microprogrammed Control.(7 Marks)

Q.4. a. Explain ripple carry adder. (8 Marks) **[15]**

Or

Explain LRU page replacement algorithm with example.(8 Marks)

b. What is data hazard? Explain operand forwarding.(7 Marks)

Or

Explain PROM, EPROM & EEPROM.(7 Marks)

Q.5. Solve any 10 MCQs. (1 Mark Each) [10]

A. The technology used by Babbage's was _____.
a. electrical b. mechanical c. both electrical & mechanical d. None of these

B. IAS computer was developed in _____ generation of computers.
a. first b. second c. third d. fourth

C. _____ has memory unit.
a. RISC b. CISC c. DISC d. None of these

D. In an IO interface, SIN holds _____ register.
a. serial b. parallel c. status d. output

E. Octal equivalent of Hexadecimal number ABCD is _____ .
a. 3775 b. 7557 c. 125715 d. 121557

F. _____ is not example of standard IO device.
a. HARD DISC b. PCI c. SCSI d. USB

G. IEEE 754 floating point format contains ____ bit mantissa.
a. 21 b. 22 c. 23 d. 24

H. CPU keeps track of the address of memory location using _____.
a. RAM b. program counter c. CPU d. disc

I. MFC stands for _____.
a. Memory First Computer b. Memory Function Computer
c. Memory Function Completed d. None of these

J. In microprogammed control unit, control signals are generated by _____.
a. program & hardware b. hardware c. program only d. None of these

K. Hardwired control unit is slower than Microprogrammed control unit.
a. TRUE b. FALSE

L. Cache memory solves memory access problem.
a. TRUE b. FALSE