PSG COLLEGE OF TECHNOLOGY, COIMBATORE - 641 004

Department of Computer Science and Engineering

BE CSE [G1 & G2] & SEM 5

CONTINUOUS ASSESSMENT TEST 1 Date: 8.8.2024

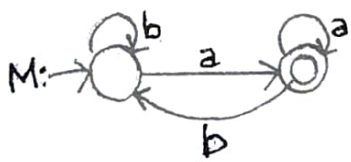
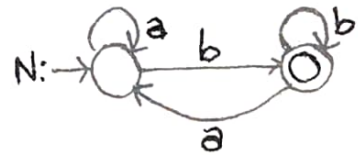
19Z501 – Theory of Computing

Time: 1 Hour 30 minutes. Maximum Marks: 50

INSTRUCTIONS:

1. Answer **ALL** questions. Each Question carries 25 Marks.
2. In each question, subdivision **a** contains 5 questions and the weightage of each question is one mark, subdivision **b(i)** and **b(ii)** carries 5 marks each and subdivision **c** carries 10 marks each.
3. Subdivisions (a) and (b) will be with no choice and Subdivision (c) may be with choice
   but not in more than 1 question.
4. Course Outcome Table

Qn. 1	CO1	Qn.2	CO2

1.a	(5x1mark=5marks)	BTL
i)	Which of the following languages is generated by the given grammar? **S → aS | bS | ε** A) a) { $a^n b^m$ | n,m ≥0} B) { w= {a,b}* | w has equal number of a's and b's} C) { a^n | n ≥0} U { b^n | n ≥0} U { $a^n b^n$ | n ≥0} D) {a+b}*	L1
ii)	Consider the following DFAs.   No of states for L(M) ∩ L(N) is A) 0 B) 1 C) 2 D) 4	L2
iii)	3) Consider L1 with productions S → aSb | ε and L2 with productions S → abS | ε. **Say True / False** P1: L1 is Regular P2: L2 is Regular A) P1 is True , P2 is True B) P1 is True , P2 is False C) P1 is False, P2 is True D) P1 is False, P2 is False	L2

iv)	Find E^R for the regular expression E=01*+10* _____	L1
v)	If we consider an arbitrary NFA (non-deterministic finite automaton) with N states in total, the maximum number of states that are there in an equivalent DFA (minimized) is at least _____	L1
b.	**(2 x 5 marks = 10 marks)**	
i)	Consider Σ ={0}. Construct DFA for language L1 (odd length strings) and L2(even length strings). Construct DFA and find the RE for the language L1-L2	L3
ii)	State pumping lemma for regular languages. Use pumping lemma to show that L = $\{a^i b^j \mid i \geq j\}$ is not regular	L3
c.	**(1 x 10 marks = 10 marks)**	
	Consider Σ = {0}. Form regular expression for odd length strings. Construct ε-NFA using Thompson's rules. Convert it to DFA using subset construction procedure. Construct minimised DFA. Show the moves of the automaton for string of acceptance. Write the procedure for subset construction. (10)	L5

2.a	**(5x1mark=5marks)**	**BTL**
i)	Context Free languages are not closed under A) substitution B) reversal C) difference D) homomorphism	L2
ii)	Consider the G={V={S,A},Σ={0,1},P, S} S→1S|0A0S|ε A→1A| ε Language accepts A) Palindromes of even length B) Palindromes of odd length C) all binary strings with an even number of 0's D) all binary strings with 11 as substring	L1
iii)	Identify the Language generated by the grammar S→AB A→aAb|ε B→bB|b A) $\{a^m b^n \mid n \geq m, m>0\}$ B) $\{a^m b^n \mid n>m, m \geq 0\}$ C) $\{a^m b^n \mid n>m, m>0\}$ D) $\{a^m b^n \mid n \geq m, m \geq 0\}$	L2

iv)	Given the grammar with the production rules **A → Aa | b**, rewrite the grammar to eliminate any left recursion.	L2
v)	Write down the regular expression for the set of strings generated by the following CFG S→SaS | b	L1
b.	**(2 x 5 marks = 10 marks)**	
i)	Analyze the different classes of languages in the Chomsky hierarchy and the corresponding types of automata that recognize these languages. For each class, provide an example of a language and justify its classification within that class.	L5
ii)	Examine the given grammar to determine whether it exhibits ambiguity. S→ABC A→aA|ε B→bC|b C→c|ε	L3
c.	**(1 x 10 marks = 10 marks)**	
i)	Evaluate the concepts of Chomsky Normal Form (CNF) and Greibach Normal Form (GNF) in the context of context-free grammars. What are the fundamental differences between these two normal forms, and what roles do they play in formal language theory? Additionally, for the provided context-free grammar G: S -> AB | a A -> aA | ε B -> bB | ε Demonstrate the process of converting it into both CNF and GNF, and explain the significance of these conversions.	L5

CA Test 1 & 2
2019 Regulations

PSG COLLEGE OF TECHNOLOGY, COIMBATORE - 641 004
Department of Computer Science and Engineering
BE CSE & SEMESTER V
CONTINUOUS ASSESSMENT TEST 1 Date: 08.08.2024
19Z504 - MICROPROCESSOR AND INTERFACING

Time: 1 Hour 30 minutes. **Maximum Marks: 50**

INSTRUCTIONS:
1. Answer **ALL** questions. Each Question carries 25 Marks.
2. In each question, subdivision **a** carries total of 5 marks (one mark for each question), subdivisions **b(i)** and **b(ii)** carries 5 marks each and subdivision **c** carries 10 marks each.
3. Course Outcome Table:

Qn. 1	CO 1	Qn.2	CO 2

1. **A**

i) Which of the following instruction is not valid?

a) MOV AX, BX
b) MOV DS, 5000H
c) MOV AX, 5000H
d) MOV DS, AX

ii) The contents of AX and word-size memory location SUM are 1234_{16}, $00CD_{16}$ respectively. After the execution of following instructions, the results of AX and SUM will be

```
ADD AX, [SUM]
INC WORD PTR [SUM]
```

a) 1301_{16} and $00CE_{16}$
b) 1031_{16} and $00CE_{16}$
c) 1304_{16} and $00CE_{16}$
d) 1301_{16} and $00DE_{16}$

iii) A program that converts high-level language codes in to equivalent machine codes is called

a) Assembler
b) Compiler
c) Interpreter
d) Debugger

iv) The BIU uses a mechanism known as an _____to implement a pipelined architecture.

v) Combining SP with the value of SS results in an address that points to the _____.

B

i) Explain the organization of registers in BIU and EU of 8086 MPU.

ii) Develop an Assembly Language Program using 8086μP to obtain the total marks of 5 subjects and its average.

C

Evaluate the various addressing modes of 8086 MPU with an example for each.

2. A

i) Upon RESET, the 8086 microprocessor starts the operations from the memory location

a) 0000H
b) 0FFFFH
c) FFFF0H
d) FFFFH

ii) The _____of the memory chip will identify and select the register for the EPROM.

a) internal decoder
b) external decoder
c) address decoder
d) data decoder

iii) How many memory chips are required to design 8k memory, if the available memory chip size is 1024 x 1?

a) 8
b) 32
c) 64
d) 128

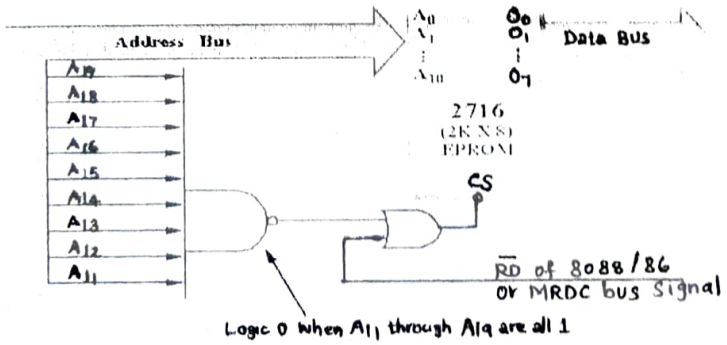
iv) A processor clock period is also called as _____.

v) The duration of bus cycle is _____in 8086 microprocessor when it is operated at 5MHz clock.

B

i) How does 8086 MPU perform byte access at an odd address and even address of memory? Justify.

ii) Analyze the interfacing circuit shown in below figure and find its memory address range.



C

Illustrate the interfacing of memory with the 8086 MPU using essential components in maximum mode configuration and interpret the data transfer technique between them.

PSG COLLEGE OF TECHNOLOGY, COIMBATORE - 641 004

Department of Computer Science and Engineering

B.E CSE 5th Semester

CONTINUOUS ASSESSMENT TEST 1 Date: 9th Aug 2024

19Z503- Artificial Intelligence

Time: 1 Hour 30 minutes. **Maximum Marks: 50**

INSTRUCTIONS:

1. Answer **ALL** questions. Each Question carries 25 Marks.
2. In each question, subdivision **a** carries total of 5 marks (one mark for each question), subdivisions **b(i)** and **b(ii)** carries 5 marks each and subdivision **c** carries 10 marks each.
3. Course Outcome Table : Q1: CO1, Q2:CO2

1. **a** **(5 x 1 mark = 5 marks)**

Write the alphabet of your choice answer in the CA test answer book mentioning question number and subdivision number.

i. AI search techniques are (mark all relevant) L1

A) A* **B)** DFS **C)** AO* **D)** BFS

ii. AI techniques are used in domains that are L1

A) fully known **B)** totally unknown **C)** partially known **D)** all of above

iii. Opposite of Sequential environments is L1

A) Discrete **B)** Episodic **C)** Continuous **D)** Static

Write the answer for the following Fill in the blanks questions in the CA test answer book mentioning question number and subdivision number.

iv. Identify one problem that Artificial Intelligence (AI) is trying to handle _____ L1

v. Intelligence is _____ L1

b. **(2 x 5 marks = 10 marks)**

i. Describe and compare the four agent architectures L3

ii. Describe the A* algorithm. Highlight the differences from Greedy algorithm L3

c. **(1 x 10 marks = 10 marks)** L5

Apply the A* algorithm to the process of traveling from Y302 PSG Tech to Town hall Coimbatore (as discussed in the class). Have specific points / states in your travel (at least five states). Use your estimates of going from one point / state to another. Please have at least

three different routes. Please use at least three different modes of travel. Also identify the attributes of the environment for each mode of travel.

2. a **(5 x 1 mark = 5 marks)**

Write the alphabet of your choice answer in the CA test answer book mentioning question number and subdivision number.

i. Adversarial search involves (is used for) L2

A) Single player **B)** Alternating moves **C)** Two players **D)** Options B and C

ii. Alpha Beta search is (mark all that are relevant) L1

A) better than minimax **B)** worse than minimax **C)** used for single player **D)** used for two players

iii. Local beam search keeps L1

A) one best state **B)** does k parallel searches **C)** only local search **D)** chooses top k successors

Write the answer for the following Fill in the blanks questions in the CA test answer book mentioning question number and subdivision number.

iv. List the operators in genetic algorithms _____ L1

v. The challenge faced by hill climbing method is _____ L1

b. **(2 x 5 marks = 10 marks)**

i. Describe how AO* algorithm can be modified to handle each type of environment challenge :Partial observability, Sequential, Continuous, Stochastic and Multi-Agent? L2

ii. Chess problem: Take a 6x6 board. Use the pieces of .King, Queen, Two Bishop and Two Horses. a) Create an evaluation function that considers each piece's capability and the advantage of a position / location on the board. b) Draw possible game plays with a 2 Ply rating. c) Use Alpha Beta cut off to prune the search space. d) Find an optimal win using Alpha Beta cut off L5

c. **(1 x 10 marks = 10 marks)** L5

Draw the full game tree for 3x3 tic tac toe, down to depth Two. You need not show nodes that are rotations or reflections of nodes at the same level already shown. (Your tree should have five leaves.). Using the evaluation function of " number of X's minus the number of O's", mark the values of all leaves and internal nodes.

Circle any node that is not evaluated, when you use alpha–beta method during a left-to-right exploration of your tree.

Suppose we wanted to solve the game to find the optimal move (i.e. no depth limit), explain why alpha–beta with an appropriate move ordering would be much better than minimax.

PSG COLLEGE OF TECHNOLOGY, COIMBATORE - 641 004

Department of Computer Science and Engineering

BE CSE & 5th Semester

CONTINUOUS ASSESSMENT TEST 1 Date: 09.08.2024

19Z504 –COMPUTER NETWORKS

Time: 1 Hour 30 minutes. **Maximum Marks: 50**

INSTRUCTIONS:

1. Answer **ALL** questions. Each Question carries 25 Marks.
2. In each question, subdivision **a** carries total of 5 marks (one mark for each question), subdivisions **b(i)** and **b(ii)** carries 5 marks each and subdivision **c** carries 10 marks each.
3.
4. Course Outcome Table :

)n. 1	CO1

)n.2	CO2

i) **a** **(5 x 1 mark = 5 marks)**

Write the alphabet of your choice answer in the CA test answer book mentioning question number and subdivision number.

i) Say True/False [L2]

a) OSI Reference model is an open standard which offers a blue print of a network to the network designers

b) It gives the running code for implementation of the layers

A) True, True B) True, False C) False, True D) False, False

ii) The most important goal of a layered network architecture is [L2]

A) Interoperability B) Feasibility C) Modularity D) Internetworking

iii) The end point of a logical channel established between two communicating hosts is identified by [L1]

A. Port address B. IP address

C. socket address D. MAC address

Write the answer for the following fill in the blanks questions in the CA test answer book mentioning the question number and subdivision number.

iv) _____ is the port number used by FTP servers. [L1]

v) When you watch a live sports channel on Internet, it generates _____ type of traffic (CBR/VBR) [L3]

b. **(2 x 5 marks = 10 marks)**

i) Even though OSI reference model has been in existence before TCP/IP reference model. Justify why the latter is more popular among network designers than the former. Draw the Internet architecture and explain the function of each layer. [L4]

ii. Hosts A and B are each connected to a switch S in the middle via 10-Mbps link

The propagation delay on each link is 20μs. S is a store-and-forward device; it begins retransmitting a received packet 35μs after it has finished receiving it. Calculate the total time required to transmit 10,000 bits from A to B.
(a) as a single packet
(b) as two 5,000-bit packets sent one right after the other. [L3]

C. **(1 x 10 marks = 10 marks)**

Suppose that a certain communications protocol involves a per-packet overhead of 100 bytes for headers and framing. We send 1 million bytes of data using this protocol; however, one data byte is corrupted and the entire packet containing it is thus lost. Give the total number of overhead+ loss bytes for packet data sizes of 1000,5000,10,000, and 20,000, bytes. Which size is optimal? [L5]

2. a **(5 x 1 mark = 5 marks)**

Write the alphabet of your choice answer in the CA test answer book mentioning question number and subdivision number.

i. The rate at which the signal changes is called the link's _____ [L2]

A. Bit rate B. Bandwidth C. Baud rate D. Both A & B

ii. What is the maximum number of hosts that could be connected to a 10 Base5 Ethernet?

A. 1000 B. 1024 C. 500 D. 200 [L1]

iii _____ defines the upper bound on the number of outstanding (unacknowledged) frames that the sender can transmit

A) SWS **B)** RWS **C)** LFR **D)** LAR

[L2]

Write the answer for the following Fill in the blanks questions in the CA test answer book mentioning the question number and subdivision number.

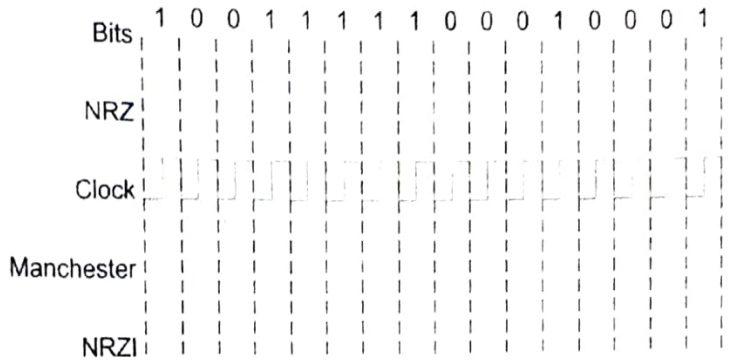
iv. Assuming SWS=RWS=7, _____ is the optimum number of bits in the sequence number field. [L3]

v. Too many consecutive 0's and 1's cause this average to change, making it difficult to detect. This problem in encoding is called as _____

[L1]

b. **(2 x 5 marks = 10 marks)**

i. Show the NRZ, Manchester, and NRZI encodings for the bit pattern shown in figure. Assume that the NRZI signal starts out low. [L3]



ii. Argue the reason for Ethernet insisting upon a minimum frame size to be used in all its transmissions. Illustrate your answer clearly and show how collisions are detected in a 10 Base 5 Ethernet. [L4]

c. **(1 x 10 marks = 10 marks)**

i. Suppose we want to transmit the message 1011001001001011 and protect it from errors using the CRC polynomial x8 + x2+x+1. [L5]
Use polynomial long division to determine the message that should be transmitted.
Suppose the leftmost bit of the message is inverted due to noise on the transmission link. What is the result of the receiver's CRC calculation? How does the receiver know that an error has occurred?

(OR)

ii) Demonstrate how sliding window algorithm automatically ensures Guaranteed delivery of data , Orderly Delivery and Flow control with clear illustrations. What is the minimum number of bits to be used for the sequence number in the following cases
RWS=1
RWS=SWS [L5]

CA Test 1

PSG COLLEGE OF TECHNOLOGY, COIMBATORE - 641 004

Department of CSE

BE CSE Semester 5

CONTINUOUS ASSESSMENT TEST 1 Date: 10/08/2024

19Z505 –Object-oriented Analysis and Design

Time: 1 Hour 30 minutes. **Maximum Marks: 50**

INSTRUCTIONS:

1. Answer **ALL** questions. Each Question carries 25 Marks.
2. In each question, subdivision **a** contains 5 questions and the weightage of each question is one mark, subdivision **b(i)** and **b(ii)** carries 5 marks each and subdivision c carries 10 marks each.
3. Subdivisions (a) and (b) will be with no choice and Subdivision (c) may be with choice but not in more than 1 question.
4. Course Outcome Table :

Qn. 1	CO1

Qn.2	CO2

1. a **(5 x 1 mark = 5 marks)**

Write the alphabet of your choice answer in the CA test answer book mentioning question number and subdivision number.

i.Name the element of a complex system that has the property by which an object continues to exist even after its creator ceases to exist. L1

A)Abstraction **B)**Concurrency **C)**Typing **D)**Persistence

ii.The inventory management system needs to provide analytical reports. Which element of the object model can be utilized to represent various report types that share common attributes and methods? L2

A) Abstraction **B)** Encapsulation **C)** Inheritance **D)** Modularity

iii.The Unified Software Development Process is primarily driven by which of the following? L1

A) Code generation **B)**Documentation **C)**Use cases **D)**Database design

Write the answer for the following Fill in the blanks questions in the CA test answer book mentioning question number and subdivision number.

iv._____ is concerned with developing a object model that capture the requirement. L1

v._____ is the least useful among the different types of abstractions in the object model. L1

b. **(2 x 5 marks = 10 marks)**

i.Consider a college as a complex system. Discover the existence of five attributes of a complex system in the college. Identify one class structure and one object structure from it. L4

ii.Show the presence of the major elements, abstraction and encapsulation from the following problem statement. Consider the case of a mobile phone. It is provided with an interface for Phone call with facilities for establishing a call, saving a number, selection of a contact. A roaming facility can also be established. Charges for roaming facility are different from that of a normal call. It also has a functionality of camera with facility to take a picture/video, flash etc. Camera facilities can be accessed through an interface. L6

c. **(1 x 10 marks = 10 marks)**

Analyze the Unified Software Development Process using a"Library management system"software to explain its phases. L4

2. a **(5 x 1 mark = 5 marks)**

Write the alphabet of your choice answer in the CA test answer book mentioning question number and subdivision number.

i.UML is an open standard maintained by L1

A) Object Management Group
B) Object Maintenance Group
B)Object Oriented Group
D)Object Design Group

ii._____ relationship can exist between two actors L1

A) Association B)Generalization C)Include D)Composition

iii.Which one of the following cannot be a base use case in a library management system? L1

A) Borrow a book B)Return a book C)Cancel membership D)Pay late fee penalty

Write the answer for the following Fill in the blanks questions in the CA test answer book mentioning question number and subdivision number.

iv.If we consider Car as a system, its brake system can be one of its different _____ L1

v._____ use case is present in every software system with different kinds of users. L1

b. **(2 x 5 marks = 10 marks)**

i.Identify an app from your smartphone, and draw a partial use case diagram which illustrates use cases showing include and generalization relationships with necessary explanation. L3

ii.Develop a short problem statement covering the most important functions of the WhatsApp messaging application. Identify an extend relationship between any two use cases you derive from the statement. Draw a simple use case diagram with the use cases involved in the extend relationship. L6

c. **(1 x 10 marks = 10 marks)**

A Car Rental System is a software built to handle the renting of automobiles for a short period of time, generally ranging from a few hours to a few weeks. A car rental system often has numerous local branches (to allow its user to return a vehicle to a different location), and primarily located near airports or busy city areas.

The requirements for the System are given below. Identify the actors, and two use cases for each actor. Create a use case diagram for the identified use cases. Write a use case specification for the most important use case.

- The system will support the renting of different automobiles like cars, trucks, SUVs, vans, and motorcycles.
- Each vehicle should be added with a unique barcode and other details, including a parking stall number which helps to locate the vehicle.

- The system should be able to retrieve information like which member took a particular vehicle or what vehicles have been rented out by a specific member.
- The system should collect a late-fee for vehicles returned after the due date.
- Members should be able to search the vehicle inventory and reserve any available vehicle.
- The system should be able to send notifications whenever the reservation is approaching the pick-up date, as well as when the vehicle is nearing the due date or has not been returned within the due date.
- The system will be able to read barcodes from vehicles.
- Members should be able to cancel their reservations.
- The system should maintain a vehicle log to track all events related to the vehicles.
- Members can add rental insurance to their reservation.
- Members can rent additional equipment, like navigation, child seat, ski rack, etc.
- Members can add additional services to their reservation, such as roadside assistance, additional driver, Wi-Fi, etc. **L6**

PSG COLLEGE OF TECHNOLOGY, COIMBATORE - 641 004

Department of Computer Science and Engineering

BE-CSE

CONTINUOUS ASSESSMENT TEST 1 Date: 10.08.2024

19Z002 - Advanced Data Structures

Time: 1 Hour 30 minutes. **Maximum Marks: 50**

INSTRUCTIONS:

1. Answer **ALL** questions. Each Question carries 25 Marks.
2. In each question, subdivision **a** contains 5 questions and the weightage of each question is one mark, subdivision **b(i)** and **b(ii)** carries 5 marks each and subdivision c carries 10 marks each.
3. Subdivisions (a) and (b) will be with no choice and Subdivision (c) may be with choice but not in more than 1 question.
4. _____ Data book / _____table(s) may be permitted.
5. Course Outcome Table :

Qn. 1	CO1	Qn.2	CO2

1. a **(5 x 1 mark = 5 marks)**

Write the alphabet of your choice answer in the CA test answer book mentioning question number and subdivision number.

i. Which of the following method use credit as the potential energy to pay for future operations?

(A) Aggregate method **(B)** Accounting method
(C) Potential method **(D)** both (A) and (B)

[L1]

ii. Using the linked-list representation of disjoint sets and the weighted-union heuristic, a sequence of m MAKE-SET, UNION, and FIND-SET operations, n of which are MAKE-SET operations, takes time _____

A) O(m + n lg n) **B)** O(m + lg n) **C)** O(n + m lg n) **D)** O((m + n) lg n) [L2]

iii. Consider an universe size of u and number of elements currently stored in the structure as n, What is the time complexity for finding the minimum element in Proto -Van Emde Boas data structure ? [L2]

A) O (lglg u) **B)** O (lglg n) **C)** θ(lg u) **D)** θ (lg u lg lg u)

Write the answer for the following Fill in the blanks questions in the CA test answer book mentioning question number and subdivision number.

iv. In _____ method the amortized cost is same for all operation, even when there are several types of operations in the sequence. [L1]

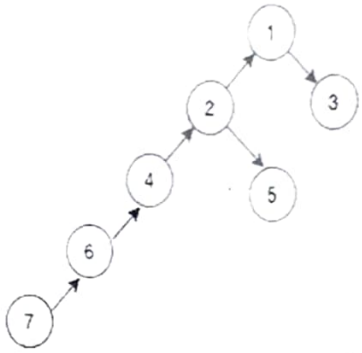
v. In a recursive structure, where the universe size shrink by the square root of itself at each level of recursion, cluster number(low(x)) of given value x is given by _____ [L1]

(2 x 5 marks = 10 marks)

b.

i. Write an algorithm for incrementing a K – bit binary counter to count upward from 0. Examine the complexity of incrementing a binary counter using asymptotic analysis and aggregate method of amortized analysis [L4]

ii. Develop an algorithm for path compression. Employ this algorithm to locate the parent of node 7 in the following rooted tree and present the resulting tree. [L5]



(1 x 10 marks = 10 marks)

c. Construct a vEB(16)-structure with the following elements: 1, 3, 5, 7, 9, 10, 11, 12, 13. Trace the insertion algorithm for inserting the element 15 into the constructed vEB structure. Analyse the complexity of insertion operation. [L5]

2. a (5 x 1 mark = 5 marks)

Write the alphabet of your choice answer in the CA test answer book mentioning question number and subdivision number.

i. Which of the following is not a property of leftist heap? [L1]

A) Key(i) >= Key(parent(i))
B) The sum of the number of edges on the shortest route from a node to the final leaf of the right child is less than or equal to that of the left child
C) The time complexity of Insert Min is O(log n)
D) It is a complete binary tree

ii. The worst case time complexity for finding the maximum element, insertion of n elements and deletion of an element in a min heap are _____ [L2]

A) O(1), O(n*log n), O(log n) **B)** O(log n), O(n * log n), O(log n)
C) O(n), O(n * log n), O(log n) **D)** O(n * log n), O(log n), O(log n)

iii. The time complexity of finding minimum and maximum element in Min-Max Heap is [L2]

A) O(1),O(1) **B)** O(1),O(log n) **C)** O(log n), O(1) **D)** O(log n), O(log n)

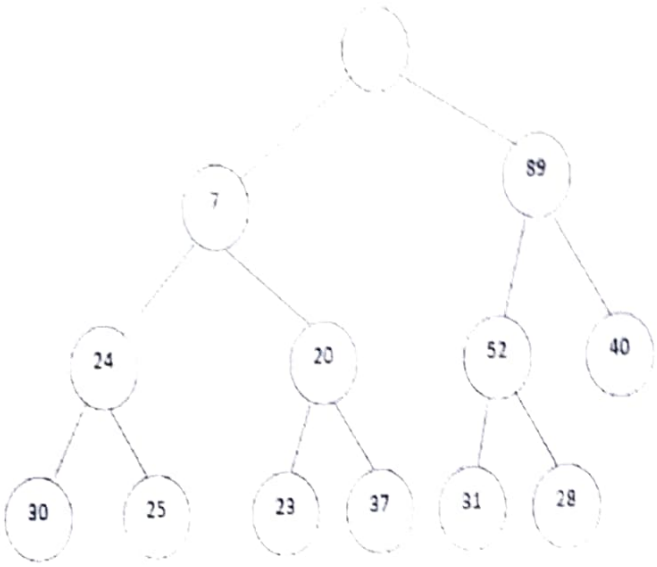
Write the answer for the following Fill in the blanks questions in the CA test answer book mentioning question number and subdivision number.

iv. Consider an element with index i in the min heap of a deap, the corresponding element in the max heap, denoted as corr(i) is found at ___ position. [L1]

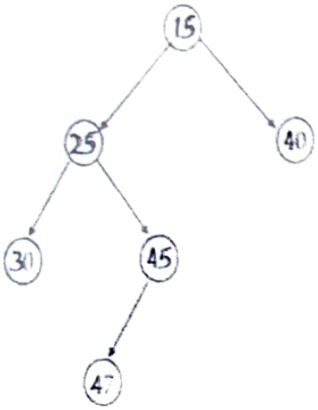
v. The maximum number of trees in a binomial heap with N nodes is_____ [L2]

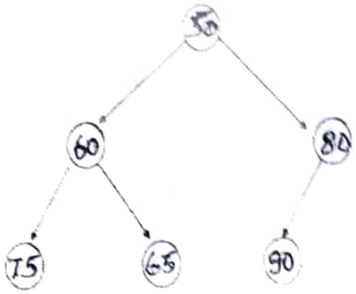
b. **(2 x 5 marks = 10 marks)**

i. Derive an algorithm to insert an element into a deap structure. Trace the algorithm for insert 6 in to the following deap structure [L5]



ii. Write an algorithm to merge two leftist heap. Trace the algorithm for merging the leftist heaps given below. [L5]





c. **(1 x 10 marks = 10 marks)**

In an initially empty min-Max heap insert the following keys in the given order: 4, 5, 2, 1, 3, 7, 9, 10, 13, 12, 14 and 15. From the constructed min-Max heap, perform delete-min followed by delete-Max. Analyse the complexity of the operations performed. [L5]