

**Suryadatta Education Foundation's
Suryadatta Institutes of Management, Pune-21**

**MCA Department
End Term Examination- February, 2023**

**MCA-I (SEM - I): A.Y. 2022-23
Subject - Java Programming**

**Subject Code : IT-11
Date :16th February 2023**

**Total Marks: 50
Time:10.00 to 12.00**

Note:

1. Q1. Is compulsory of MCQ type consisting 20 questions for 10 marks.
2. Each question carries equal 10 marks.

Q1.		(10 marks)
Q 1. Platform independent code file created from Source file is understandable by _____ A. JRE B. JVM C. Applet D. Compiler	Q 2. Which of the tool is used to compile java code ? A. jar B. javac C. javadoc D. java	
Q 3. Byte variables are declared by use of the _____ keyword (Using Primitive Data Type). A. Bytes B. byte C. Byte D. bytes	Q 4. An _____ statement can be used to access the classes and interface of a different package from the current package. A. instanceof B. import C. extends D. implement	
Q 5. Which of this access specifies can be used for a class so that its members can be accessed by a different class in the same package? A. Public B. Protected C. No Modifier D. All of the mentioned	Q 6. Which of the following is false statement about package in java? A. Packages are used for preventing naming conflicts B. Providing controlled access: protected and default have package level access control. C. Packages cannot be considered as data encapsulation D. Both B and C	

Q7. Which of these keywords must be used to monitor for exceptions?

- A. finally
- B. throw
- C. catch
- D. try

Q 9. When an exception in a try block is generated, the Java treats the multiple _____ statements like cases in switch statement.

- A) throw
- B) catch
- C) finally
- D) try

Q 11. Exception classes are available in the package.

- A) java.lang
- B) java.awt
- C) java.io
- D) java.applet

Q13. We can calculate the length of an array using _____.

- A. sizeof(array)
- B. array.len
- C. array.length
- D. array.sizeof()

Q15. Consider the following code,
string s=new String(); will create an instance of string with

- A) at least one character
- B) a default character
- C) no characters in it
- D) number of characters in it

Q 8. When do Exceptions in Java arise in code sequence?

- A. Run Time
- B. Can Occur Any Time
- C. Compilation Time
- D. None of the mentioned

Q 10. The -----statement can be used to handle an exception that is not caught by any of the previous catch statements.

- A) throw
- B) catch
- C) finally
- D) try

Q 12. When a block is defined, this is guaranteed to execute, regardless of whether or not an exception is thrown.

- A) throw
- B) catch
- C) finally
- D) try

Q14. Which of the following is used to declare, construct, and initialize an array?

- A. int arr [] [] = {1, 2, 3, 4};
- B. int [] arr = {1, 2, 3};
- C. int [] arr = {};
- D. int arr [] = {1, 2, 3};

Q16. method simply return a string that appropriately describes an object of your class.

- A) getChars()
- B) toString()
- C) toCharArray()
- D) getString()

Q17. What is the listener used to handle the events of a text field?

- A. java.awt.ActionListener interface
- B. java.awt.event.ActionListener
- C. awt.event.ActionListener interface
- D. java.awt.event.ActionListener interface

Q18. getLabel() method used to retrieve the label of a button.

- A. Yes
- B. No
- C. Can be yes or no
- D. Cannot say

Q19. The java.sql and javax.sql are the primary packages for JDBC 4.0.

- A. Yes
- B. No
- C. Can be yes or no
- D. Cannot say

Q 20. _____ are small programs that are downloaded into a Java Enabled Web Browser.

- A) Applets
- B) Servlets
- C) HTML
- D) JavaScript

Q2. (a) Write a java program to design the following GUI

(6 marks)

<u>Personal Information</u>	
First Name :	<input type="text"/>
Last Name :	<input type="text"/>
Address :	<input type="text"/>
Mobile Number :	<input type="text"/>
Gender	<input type="radio"/> Male <input type="radio"/> Female
Your Interests	<input type="checkbox"/> Computer <input type="checkbox"/> Sports <input type="checkbox"/> Music
<input type="button" value="Submit"/> <input type="button" value="Reset"/>	

(b) Explain Wrapper classes in java.

(4 marks)

OR

Q2. (a) Different types of Layout Managers with Examples

(6 marks)

(b) Explain Action Listener class.

(4 marks)

Q3. (a) Write a JDBC application to insert, update and delete record from Company Shareholder's Table. Given the structure: SHAREHOLDER : holder_id, Hname, Address, NoOfShares, ShareSrFrom (Share Serial from Number), ShareSrTo (Share Serial upto Number), facevalue, cost.
(7 marks)

(b) What is RequestDispatcher? (3 marks)

OR

Q3. (a) Write a servlet to accept student information from the HTML page, and store the details in a database. [Note : Take suitable fields, student table is already present]
(7 marks)

(b). Explain Servlet life-cycle. (3 marks)

Q4. (a) What is the difference between the Enumeration and Iterator interface? (5 marks)

(b) Differentiate between method and constructor. (5 marks)

OR

Q4. (a) What is the difference between Iterator and ListIterator? (5 marks)

(b) Explain 'this' and 'super' keyword. (5 marks)

Q5. Write short notes: (Attempt ANY TWO) (10 marks)

(a) Thread Life Cycle

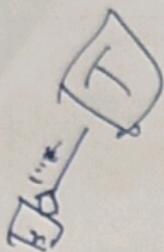
(b) Abstract Class & Interfaces

(c) Thread Synchronization

(d) InputStreamReader & OutputStreamWriter

-----Best Of Luck-----

Suryadatta Education Foundation's
Suryadatta Institutes of Management, Pune-21



MCA Department
End Term Examination- January, 2023

MCA-I year (SEM - I): A.Y. 2022-23
Subject - IT13 - Object Oriented Software Engineering

Subject Code : IT13
Date : 16/02/2023

Total Marks : 50
Time : 2:00 pm to 4:00 pm

Note:

- Q1. is compulsory of MCQ type consisting 20 questions for 10 marks.
- Each question carry equal 10 marks.

Q1.

(10 marks)

1. Structured approach focuses on..... (a) Functions (b) Algorithm (c) Objects (d) None of the above	2. A use case diagram is used to model of a system. (a) Structure (b) Behaviour (c) Organization (d) None of the above
3. Use Case "Make Reservation" and "Check Seat Availability" exhibit relationship----- (a) <<include>> (b) <<Uses>> (c) <<stereotype>> (d) <<Extend>>	4. Difference between activity diagram and flow chart is that ----- (a) concurrency is shown by activity (b) concurrency is not shown by activity (c) Sequence is not shown by activity (d) None of Above
5. An activity diagram reflects flow of among objects. (a) messages (b) processes (c) control (d) data	6. System boundary around the use cases represents----- (a) Objectives (b) Users part (c) Scope of the system (d) actors area
7. Which of the following is the important parts of SRS document are..... (a) Requirements gathering and budget (b) Verification and validation (c) Functional requirements of the system and Non-functional requirements of the system (d) Stakeholders requirements and project duration time	8. User requirements are expressed as in Extreme Programming. (a) implementation tasks (b) functionalities (c) scenarios (d) none of the mentioned

--) 29

(1)

<p>9. Which of the following is not a type of user interface?</p> <p>(a) Command language based (b) Menu based (c) Efficiency based (d) Direct manipulation based</p>	<p>10. What are the Shneiderman's Golden Rules?</p> <p>(a) Strive for consistency (b) Cater to Universal Usability (c) Offer informative feedback (d) All of them</p>
<p>11. Which diagram shows the configuration of run-time processing elements ?</p> <p>(a) Deployment diagram (b) Component diagram (c) Node diagram (d) ER-diagram</p>	<p>12. In XP Increments are delivered to customers every _____ weeks.</p> <p>(a) One (b) Two (c) Three (d) Four</p>
<p>13. In an Agile environment, what is the main responsibility of a tester ?</p> <p>(a) Create test scenarios and test case (b) Finding bugs (c) Create automation scripts (d) There is no role as a Tester in Scrum</p>	<p>14. The Agile approach to documentation is :</p> <p>(a) Do more documentation than usual, because Agile is risky (b) Do no documentation – it is a waste of time (c) Do plenty of documentation, to prove you have done a good job (d) Do the necessary documentation to support the use of the product</p>
<p>15. In phase 1 of the SDLC, which of the following aspects are usually analysed ?</p> <p>(a) outputs (b) input(transactions) (c) controls (d) all of the above</p>	<p>16. The illustrates how process models can be combined with one another to good effects, such as by integrating prototyping in order to reduce risk.</p> <p>(a) Waterfall Model (b) Spiral Model (c) Prototyping Model (d) Evolutionary Development Model</p>
<p>17. A software requirements specification (SRS) document should avoid discussing which one of the following ?</p> <p>(a) Functional requirements (b) Non-functional requirements (c) Design specification (d) Constraints on the implementation</p>	<p>18. The system implementation phase of SDLC includes the following activities :</p> <p>i) Planning for implementation ii) Preparing the schedule for implementation iii) Procurement of hardware iv) Installation of software</p> <p>(a) i, ii and iv only (b) ii, iii and iv only (c) i, ii and iii only (d) All i, ii, iii and iv</p>
<p>19. Breaking the system modules into smaller programs and allocating these programs to the members of the system development team is the activity involved in</p> <p>(a) System Design Phase (b) System Development Phase (c) System Analysis Phase (d) System Implementation Phase</p>	<p>20. Agile Software Development is based on</p> <p>(a) Incremental Development (b) Iterative Development (c) Linear Development (d) Both Incremental and Iterative Development</p>

Q2.

(a) Prepare SRS in IEEE format for the following system: (10 marks)

The proposed software product is a Dispensary web app. The system will be used to get the information from the patients and then storing that data for future usage. The current system in use is a paper-based system. It is too slow and cannot provide updated lists of patients within a reasonable timeframe. The intentions of the system are to reduce overtime pay and increase the number of patients that can be treated accurately. Requirements statements in this document are both functional and non-functional. The product should be able to perform the following operations:

1. It must be able to authenticate the user by matching the email id and the password code against the values stored in the database.
2. It must be able to check the patient's history or track record if he/she is already registered with the software by referring to the database for the same.
3. It must be able to calculate the BMI of an individual by taking the required inputs from the user.
4. It must be able to provide slot-booking facilities to the patients so that they can fix their appointments with the respective doctors.

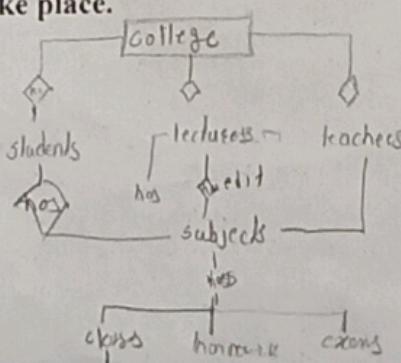
OR

(b) Prepare SRS in IEEE format for the following system:

My Study Life is a free online planner for students, teachers and lecturers designed to make your study life easier to manage. My Study Life is a cross-platform planner for students, teachers and lecturers designed to make your study life easier to manage. My Study Life allows you to store your classes, homework and exams in the cloud making it available on any device, wherever you are.

Unlike a paper planner or school diary, My Study Life integrates all areas of your academic life -see homework due and overdue for classes, classes which conflict with your exams and even add revision tasks for a specific exam -all in a free, easy to use application. Far from your standard calendar, My Study Life is optimized to work for your school life right from the start with support for week and day rotation schedules. Add your classes and view them in a beautiful, instantly identifiable, familiar week view. My Study Life seamlessly syncs your data between devices, allowing you to use the app even when offline. You can add a task on the move from your phone or tablet and it will be instantly available on the web application. This application is available for Android, iPhone, and Window devices as well as for web. Some of the essential features of My Study Life are as follows :

1. **Track Tasks:** Store your tasks -- homework, assignments, reminders, and revision -- with ease in the cloud, that can be accessible from anywhere.
2. **Store Exams:** Store all your important exams alongside your classes and revision tasks.
3. **Manage your classes:** Supporting day and week rotation timetables, advanced academic year/term support and integration into tasks.
4. **Notifications:** It notifies you with reminders for unfinished tasks, upcoming exams and classes before they take place.



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Q3.

(10 marks)

(a) Online library has 3 modules, view book (title wise, author wise and subject wise). Issue and receive module accepts book issue and receipt details. Admin module is meant for maintaining user and passwords. For issue of book, user has to enter login id and password and enter the book title / number. System crosschecks for validity of user and availability of book. After checking both, book will be issued if available, else give appropriate message.

Draw Use-case and Activity diagram.

OR

(b) A website for a restaurant has option for ordering food online. User can go through the menu and select the items. Seasonal items are available for particular seasons. Other items can be ordered at any time. System gives an acknowledgement for the order. Every order is followed by a payment module that accepts card details. If user expects home delivery then additional 5% charges will be automatically added to the amount for calculation of bill.

Draw Use-case and Activity diagram.

Q4. (a) Design a User Interface for the creation of Student's Academic Bank Credit (ABC) account.

(10 marks)

OR

(b) Design UI for the new enrollment course in SPPU.

online data science

Q5. Write short notes : (Attempt ANY TWO)

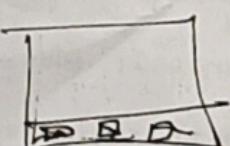
(10 marks)

(a) What are 12 manifesto of Agile development?

(b) Explain Dynamic Systems Development Method (DSDM).

(c) Write a short note on Extreme Programming (XP).

(d) Explain RUP model with all phrases in detail.



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Suryadatta Education Foundation's
Suryadatta Institutes of Management, Pune-21

MCA Department
End Term Examination- February, 2023

MCA-I (SEM - I): A.Y. 2022-23
Subject --Network Technologies

Subject Code : IT15- Network Technologies
Date :

Total Marks: 50
Time:

Note:

1. Q1. is compulsory of MCQ type consisting 20 questions for 10 marks.
2. Each question carries equal 10 marks.

Q1.

(10 marks)

<p>Q1. Which of the following is true with respect to UDP?</p> <p>A. Connection-oriented B. Unreliable C. security protocol D. 3-way handshake</p>	<p>Q2. Which of the following attacks is a passive attack?</p> <p>a. Masquerade b. Modification of message c. Denial of service d. Traffic analysis</p>
<p>Q3. Which is more efficient?</p> <p>a) Parity check b) Cyclic redundancy check c) Parity & Cyclic redundancy check d) None of the mentioned</p>	<p>Q4. What should be the flag value to indicate the last fragment?</p> <p>A. 1 B. 0 C. empty D. 00</p>
<p>Q5. The data section of the frame has an extra byte is called the</p> <p>A. Byte Stuffing B. Bit Stuffing C. Preamble D. Number Stuffing</p>	<p>Q6. Logical Addresses are</p> <p>A. 16 bits B. 32 bits C. 128 bits D. 64 bits</p>
<p>Q7. Radio waves are</p> <p>A. Directional B. TriDirection C. Omnidirectional D. UniDirectional</p>	<p>Q8. Microwaves having frequency between</p> <p>A. 1kHz to 300 GHZ B. 100 KHZ to 1GHZ C. 300 KHZ to 1GHZ D. 1 KHZ to 1GHZ</p>

<p>Q9. The.....Internet Address uses 32-bits in length</p> <ul style="list-style-type: none"> A. IPv2 B. IPv1 C. IPv4 D. IPv6 	<p>Q10. Point-to-Point Protocol (PPP) is a</p> <ul style="list-style-type: none"> A. Byte Oriented Protocol B. Connection Oriented Protocol C. Connectionless Protocol D. File Transfer Protocol
<p>Q11. The frame type that refers to a High-level Data Link Control (HDLC) error detection field is</p> <ul style="list-style-type: none"> A. Frame Check Sequence Field B. Sequence field C. Inform Field D. Tailor Field 	<p>Q12. Optical fibres use reflection to guide light through a</p> <ul style="list-style-type: none"> A. Channel B. Plastic Wire C. Light D. Metal Wire
<p>Q13. In Normal Response Mode (NRM), the station configuration is</p> <ul style="list-style-type: none"> A. Unbalanced B. Balanced C. Undefined D. Control 	<p>Q14. The masks in slash notation of 255.255.255.0 would be</p> <ul style="list-style-type: none"> A. /8 B. /16 C. /24 D. /2
<p>Q15. CRC Stands for</p> <ul style="list-style-type: none"> A. Cyclic Redundancy Code B. Cyclic Redundancy Check C. Cyclic Reduce Code D. Cyclic Reduce Check 	<p>Q16. How many bits in the data unit have changed in a single bit error?</p> <ul style="list-style-type: none"> A. Only 1 B. Any 2 C. Only 3 D. Any 4
<p>Q17. The class of the Internet Protocol (IP) addresses 208.34.54.12 will be</p> <ul style="list-style-type: none"> A. Class A B. Class B C. Class C D. Class D 	<p>Q18. Transmission media are directly controlled by the</p> <ul style="list-style-type: none"> A. Application Layer B. Physical Layer C. Session Layer D. Network Layer
<p>Q19. Carrier Sense Multiple Access (CSMA) is based on the medium called</p> <ul style="list-style-type: none"> A. Listen before Talk B. Sense before Transmit C. Sense After Transmit D. Listen before Transmit 	<p>Q20. The network layer of Transmission Control Protocol/Internet Protocol (TCP/IP) is responsible for</p> <ul style="list-style-type: none"> A. Physical Addressing B. Logical Addressing C. Port Addressing D. URL

- Q2.** (a) What is the Default mask for following IP Addresses? (Solve with procedure).
- i) 121.14.16.08
 - ii) 172.14.35.14
 - iii) 98.0.74.120
 - iv) 210.35.67.8
 - v) 121.134.68.23

(5 marks)

- (b) Explain the scenario of HTTP request and response in detail. (5 marks)

OR

- Q2.** (a) What is email? Explain the email protocol. (5 marks)
(b) Write a note on HDLC. (5 marks)

- Q3.** (a) What is P2P? Explain the transition phases of working of this protocol. (5 marks)

- (b) Explain IPv4 Vs IPV6. (5 marks)

OR

- Q3.** (a) Write a simple Daytime Client's socket program. (5 Marks)
(b) Write a note on DNS. (5 Marks)

- Q4.** (a) Explain the TCP\IP Model. (5 marks)

- (b) Explain RIP in details. (5 marks)

OR

- Q4.** (a) Write a note on CSMA-CD (5 marks)

- (b) Explain any two guided transmission media. (5 marks)

- Q5.** Write short notes: (Attempt ANY TWO) (10 marks)

- (a) In given class A, IP Address -192.168.10.0/26

Find i) Number of Subnets

ii) Number of Hosts

iii) Broadcast IP Address

iv) Network ID

- (b) In given class IP Address -205.150.65.0/26

Find i) Number of Subnets

ii) Number of Hosts

iii) Broadcast IP Address

iv) Network ID

- (c) Consider given Message M(X) 100100 transmitted by using Generator G(x) = $X^3 + X^2 + 1$. Calculate CRC for the Transmission.

Suryadatta Education Foundation's
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MCA Department
End Term Examination- February, 2023

MCA-I (SEM - I): A.Y. 2022-23
Subject - IT-12 : Data Structure and Algorithms

Subject Code : - IT-12
Date : 20/2/2023

Total Marks: 50
Time: 2 Hours (10:00 to 12:00 pm)

Note:

- Q1. is compulsory of MCQ type consisting 20 questions for 10 marks.
- Each question carries equal 10 marks.

Q1.

(10 marks)

<p>Q1. What is the time complexity to count the number of elements in the linked list?</p> <p>a) $O(1)$ b) $O(n)$ c) $O(\log n)$ d) $O(n^2)$</p>	<p>Q2. What is the space complexity for deleting a linked list?</p> <p>a) $O(1)$ b) $O(n)$ c) Either $O(1)$ or $O(n)$ d) $O(\log n)$</p>
<p>Q3. Which of the following is not the application of stack?</p> <p>a) A parentheses balancing program b) Tracking of local variables at run time c) Compiler Syntax Analyzer d) Data Transfer between two asynchronous process</p>	<p>Q4. What does 'stack overflow' refer to?</p> <p>a) accessing item from an undefined stack b) adding items to a full stack c) removing items from an empty stack d) index out of bounds exception</p>
<p>Q5. Circular Queue is also known as _____</p> <p>a) Ring Buffer b) Square Buffer c) Rectangle Buffer d) Curve Buffer</p>	<p>Q6. A normal queue, if implemented using an array of size MAX_SIZE, gets full when?</p> <p>a) $\text{Rear} = \text{MAX_SIZE} - 1$ b) $\text{Front} = (\text{rear} + 1) \bmod \text{MAX_SIZE}$ c) $\text{Front} = \text{rear} + 1$ d) $\text{Rear} = \text{front}$</p>
<p>Q7. The number of edges from the root to the node is called _____ of the tree.</p> <p>a) Height b) Depth c) Length</p>	<p>Q8. What is a full binary tree?</p> <p>a) Each node has exactly zero or two children b) Each node has exactly two children c) All the leaves are at the same level d) Each node has exactly one or two</p>

1

d) Width	children
<p>Q9. Which of the following is not an advantage of trees?</p> <ul style="list-style-type: none"> a) Hierarchical structure b) Faster search c) Router algorithms d) Undo/Redo operations in a notepad 	<p>Q10. What is the special property of red-black trees and what root should always be?</p> <ul style="list-style-type: none"> a) a color which is either red or black and root should always be black color only b) height of the tree c) pointer to next node d) a color which is either green or black
<p>Q11. . Which of the following sorting algorithms is the fastest?</p> <ul style="list-style-type: none"> a) Merge sort b) Quick sort c) Insertion sort d) Shell sort 	<p>Q12. . What is the worst case time complexity of a quick sort algorithm?</p> <ul style="list-style-type: none"> a) $O(N)$ b) $O(N \log N)$ c) $O(N^2)$ d) $O(\log N)$
<p>Q13. The optimal data structure used to solve Tower of Hanoi is _____</p> <ul style="list-style-type: none"> a) Tree b) Heap c) Priority queue d) Stack 	<p>Q14. What is the average case time complexity of merge sort?</p> <ul style="list-style-type: none"> a) $O(n \log n)$ b) $O(n^2)$ c) $O(n^2 \log n)$ d) $O(n \log n^2)$
<p>Q15. . Prim's algorithm is a _____</p> <ul style="list-style-type: none"> a) Divide and conquer algorithm b) Greedy algorithm c) Dynamic Programming d) Approximation algorithm 	<p>Q16. Which of the following problems should be solved using dynamic programming?</p> <ul style="list-style-type: none"> a) Mergesort b) Binary search c) Longest common subsequence d) Quicksort
<p>Q17. Which of the problems cannot be solved by backtracking method?</p> <ul style="list-style-type: none"> a) n-queen problem b) subset sum problem c) hamiltonian circuit problem d) travelling salesman problem 	<p>Q18. Placing n-queens so that no two queens attack each other is called?</p> <ul style="list-style-type: none"> a) n-queen's problem b) 8-queen's problem c) Hamiltonian circuit problem d) subset sum problem
<p>Q19. Which approach is based on computing the distance between each pair of distinct points and finding a pair</p>	<p>Q20. . What is the speciality about the inorder traversal of a binary search tree?</p>

(Q2)

with the smallest distance?

- a) Brute force
- b) Exhaustive search
- c) Divide and conquer
- d) Branch and bound

- a) It traverses in a non increasing order
- b) It traverses in an increasing order
- c) It traverses in a random fashion
- d) It traverses based on priority of the node

- Q2)** a) Apply the algorithm to draw Binary search tree for the following data. 10, 08, 15, 12, 13, 07, 09, 17, 20, 18, 04, 05 [5]
- b) Compare Linear Queue and Circular Queue. [3]
- c) Explain Stack and its following operation [2]
- i. Push
 - ii. Pop

OR

- a) Explain Fibonacci Number with respect to dynamic programming [3]
- b) Construct Binary Tree for following data 10, 25, 2, 4, 7, 13, 11, 22 and determine inorder, postorder & preorder? [5]
- c) Define Hash function 2 collision. [2]

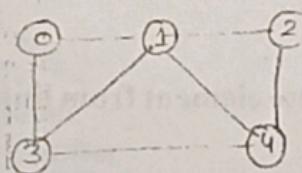
- Q3)** a) Apply Rain Terrace algorithm to the following problem.

Input:- Height = [4, 2, 0, 3, 2, 5]. Draw the figure and find solution. [4]

- b) Explain power set with example. [3]
- c) Discuss use of priority queue. [3]

OR

- a) What is Binary Search? [3]
- b) Find the Hamiltonian cycle from following graph. [4]



- c) Write an algorithm to count number of nodes in singly linked list. [3]

(3) ~~3~~

Q4) a) What is Jump Game algorithm?

[4]

b) Sort the following data using merge sort algorithm [38, 27, 43, 3, 9, 82, 10].

[4]

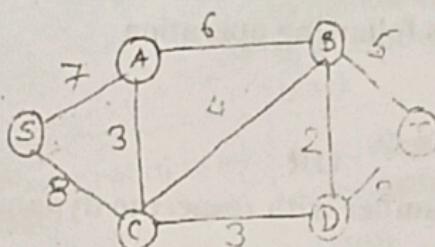
c) Explain need of circular queue.

[2]

OR

a) Illustrate the stages, in finding the minimum cost spanning tree for given graph using Prim's algorithm.

[4]



b) Explain Rules for Tower of Hanoi with an suitable example.

[4]

c) What is the purpose of linked list?

[2]

Q5) a) Consider the instance of 0/1 knapsack problem n = 3, m = 20, p = (25, 24, 15), w = (18, 15, 10) using dynamic programming. Determine the optimal profit and the solution vector.

[7]

b) Write an algorithm to reverse the nodes of a linked list.

[3]

OR

a) Find the longest common subsequence for following string using dynamic programming.

X = {A, B, C, D, B, A, C,

D, F} Y = {C, B, A, F}

b) Write an algorithm delete element from linked list whose sum is equal to zero.

[1]