

Full Marks-70;

Credit Hour-3

Time- 3 Hours.

[Answer any five of the following questions. The right margin indicates marks distribution. Different parts of the same question (if any) must be answered in order of given sequence.]

1. a) Define accounting. Briefly explain the importance of accounting. 3
- b) Bob opened the Campus Laundromat on January 1, 2022. During the first month of operations, the following transactions occurred.
- Jan. 1 Bob invested Tk. 20,000 cash in the business.
- 2 The company paid Tk. 1,000 cash for store rent for January.
- 3 Purchased washers and dryers for Tk. 25,000, paying Tk. 10,000 in cash and signing a Tk. 15,000, 6-month, 12% note payable.
- 4 Paid Tk. 1,200 for a one-year accident insurance policy.
- 10 Received a bill from the *Daily News* for advertising the opening of the laundromat Tk. 200.
- 20 Bob withdrew Tk. 700 cash for personal use.
- 30 The company determined that cash receipts for laundry services for the month were Tk. 6,200.

You are required to:

- i. Journalize the transactions. 4
 - ii. Post to the ledger accounts. 4
 - iii. Prepare a trial balance on January 31, 2022. 3
- a) Briefly explain Marginal Cost and Opportunity cost with two suitable examples each. 3
- b) Mabo Company makes calculators that sell for Tk. 20 each. For the coming year, management expects fixed costs to total Tk. 220,000 and variable costs to be Tk. 9 per unit. 3

You are required to Compute:

- i. Break-even point in units using the mathematical equation
 - ii. Margin of safety percentage assuming actual sales are Tk. 500,000.
 - iii. Sales required in dollars to earn net income of Tk. 165,000.
- c) Krisanne Company reports the following operating results for the month of June 2017. 6

| <u>Particulars</u> | <u>Total</u> | <u>Per unit</u> |
|---------------------|--------------|-----------------|
| Sales (5000 units) | Tk. 300,000 | 60 |
| Variable costs | 180,000 | 36 |
| Contribution Margin | 120,000 | 24 |
| Fixed Cost | 100,000 | |
| Net Income | 20,000 | |

To increase net income, management is considering reducing the selling price by 10%, with no changes to unit variable costs or fixed costs. Management is confident that this change will increase unit sales by 25%.

You are required to

- i. Compute the break-even point in units and dollars and the margin of safety in using the contribution margin technique (a) assuming no changes to sales price or c and (b) assuming changes to the sales price and volume as described above.
- ii. Comment on your findings.
3. a) What is trial Balance? Why an organization prepared a trial balance.
- b) Lori Figgs is confused about the lack of agreement between the cash balance per book and the balance per bank. Explain the causes for the lack of agreement with Lori, and give an example of each cause.
- c) The following information was obtained from the books of accounts of Smart manufacturing Company Ltd. for the year ended 31.12.2021.

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| Particulars | Tk. | Particulars | Tk. |
|------------------------------------|--------|-----------------------|--------|
| Direct Materials | 100000 | Consumable stores | 2500 |
| Direct Wages | 3000 | Manager's Salary | 5000 |
| Wages of Foreman | 2500 | Directors' fees | 1250 |
| Lighting: Factory | 1500 | Office Stationery | 500 |
| Office | 500 | Telephone Charges | 125 |
| Storekeeper's wages | 1000 | Postage and Telegrams | 250 |
| Oil and water | 500 | Salesmen's salary | 1250 |
| Rent: Factory | 5000 | Traveling expenses | 500 |
| Office | 2500 | Advertising | 1250 |
| Repairs and Renewals: | | Warehouse charges | 500 |
| Factory plant | 3500 | Sales | 189500 |
| Transfer to Reserves | 1000 | Carriage outward | 375 |
| Discount on shares written off | 500 | Dividend | 2000 |
| Depreciation: Factory Plant | 500 | Electric power | 500 |
| Office Premises | 1250 | | |

You are required to Calculate

- i. Prime Cost ii. Factory Cost iii. Cost of Production
iv. Cost of Sales v. Profit/loss

- 4.a) i) "Management is both science and art". Do you agree or not? Give your argument.
- ii) "Though controlling is viewed as last function of management rather it is the starting point of next year of planning". Do you agree or not? Give your argument.
- b) "As a manager you have to play ten roles according to Henri Mintzberg". Explain the statement with proper judgment.
- c) What are the skills that are needed for the various levels of management according to Robert L. Katz? Explain.
- a) Define scientific Management. Explain four (04) principles of scientific management suggested by F. W. Taylor.
- b) Discuss the Max Weber's concept of Ideal Organization "Bureaucracy" with its characteristic.



: short notes: (any six)

- a) Division of work ii) Unity of command iii) Unity of direction iv) Scalar chain
- b) Subordination of individual interest to group interest vi) Equity vii) Discipline
- c) Give five examples of charismatic political leaders in the word.
- d) Discuss the bases of power a leader may need.
- e) "Leaders are born not made". Do you agree or not. Give your judgment.
- f) "Team manager is concerned with high production and high employee welfare while impoverished leader is concerned lower production and lower employee welfare". Explain this concept as per Blake and Mouton's Managerial Grid.



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| Time | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|-------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Input data | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 |
| Frequency | f ₁ | f ₂ | f ₃ | f ₄ | f ₅ | f ₆ | f ₇ | f ₈ |
| PN sequence | 001 | 001 | 001 | 001 | 001 | 001 | 001 | 001 |

| Time | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | |
|-------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----|-----|---|
| Input data | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| Frequency | f ₁ | f ₂ | f ₃ | f ₄ | f ₅ | f ₆ | f ₇ | f ₈ | f ₉ | f ₁₀ | | | |
| PN sequence | 001 | 001 | 001 | 001 | 001 | 001 | 001 | 001 | 001 | 001 | 001 | 001 | |

complete period of the PN sequence.

The following table illustrates the operation of an FHS system for one

[D.]

Only the sender of a data transmission needs to be concerned about the rules or protocols that govern how it communicates with the receiver. State with explanation, whether the given statement is true or false.

[C.]

Illustrate the transmission scenario and explain with justification.

Why or why not?

Station A needs to send a message consisting of 9 packets to station B using a sliding window (window size 3) and go-back-n error control strategy. All packets are ready and immediately available for transmission. If every 5th packet that A transmits gets lost (but no ACKs from B ever get lost), then what is the number of packets that A will transmit for sending the message to B?

Only the sender of a data transmission needs to be concerned about the rules or protocols that govern how it communicates with the receiver. State with explanation, whether the given statement is true or false.

[B.]

Why or why not?

noise, the receiver gets the byte 10011010. Will the receiver detect the error? detection. The transmitter sends the byte 10101010 and, because of channel detection, the receiver gets the byte 10011010. Will the receiver detect the error?

[A.]

Has any implementation of OSI model? Make comparison between the OSI Model with the TCP/IP Model.

[B.]

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Answer any 05 out of 06 Questions (Split answers are highly discouraged)

i. Explain a simplified communication model with example.

ii. Describe Source Port and Destination Port Field in TCP Header.

iii. How Sequence Number Field and Acknowledgment Number Field in TCP Header work?

iv. Explain a simple TCP communication model with example.

v. Explain a simplified communication model with example.

Course Code: CCB-211 Data Communication and Networking
Course Title: Data Communication and Networking
Semester: I Session: 2019-2020
Credit: 03
Time: 03 Hrs
Final Examination of B.Sc. English Medium in CSE Level: 2
Duration: Paulskhall-8602, Bangalore University
Paper Code: Paper-I Selection and Emerging
Papers and Technologies
Date: January-June 2021
Marks: 70



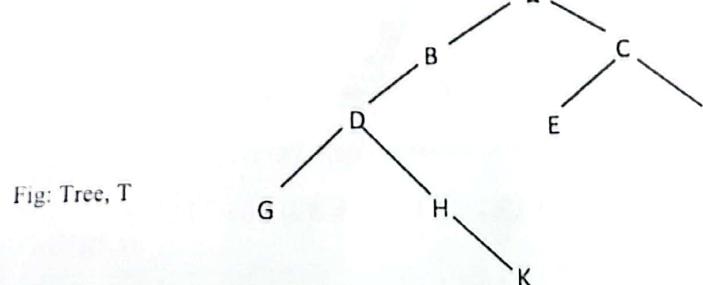
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Faculty of Computer Selection and Emerging
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- i. What is the period of the PN sequence, in terms of bits in the sequence? 2
 - ii. The system makes use of a form of PSK. What form of VSK is it? 6
 - iii. What is the number of bits per signal element? 3.5
 - iv. What is the number of FSK frequencies? 2.5
 - v. What is the length of a PN sequence per hop? 6
 - vi. Is this a slow or fast FH system? 4
 - vii. What is the total number of possible carrier frequencies? 4
 - viii. Show the variation of the base, or demodulated, frequency with time.
- In which means signals transmit without guided medium?
- I How are binary values represented in amplitude shift keying and in binary frequency shift keying? What are the limitations of these approaches?
- A Coaxial cable is a two-wire transmission system. What is the advantage of connecting the outer conductor to ground?
- D. What is frequency-hopping spread spectrum?
- A.] Why is a statistical time division multiplexer more efficient than a synchronous time division multiplexer? Briefly explain with figure.
- B.] For the bit stream 01001110, sketch the waveforms for each of the codes of digital signal encoding formats (Digital data, digital signal). Assume that the signal level for the preceding bit for NRZI was high; the most recent preceding 1 bit (AMI) has a negative voltage; and the most recent preceding 0 bit (pseudoternary) has a negative voltage.
- C.] Demonstrate by example that a receiver that suffers a framing error on asynchronous transmission will eventually become realigned. Write down a few dozen arbitrary bit patterns; assume one start bit and a stop element of length one bit.

[Figure in the right margin indicates full marks. Split answering of any question is not recommended.]

Answer any 5 of the following questions. Answer must be brief, relevant and neat.

1. a) Define the following terms in your own words. Data, Entity, Attributes, Records, and Data structure. 3
- b) What is linear array? Demonstrate the representation of linear array in memory. Suppose a 10-element array A contains the values a_1, a_2, \dots, a_{10} . Find the values in A after each loop. 2+4
- i) Repeat for K=1 to 9
Set $A[K+1] := A[K]$
[End of loop.]
 - ii) Repeat for K=9 to 1 by -1.
Set $A[K+1] := A[9]$
[End of loop.]
- c) Mention the sorting principle of bubble sort algorithm. Suppose the following numbers are stored in an array A: 32, 51, 27, 85, 66, 23, 13, 57. You are asked to apply the bubble sort algorithm to the array A and discuss each pass separately. 1+4
2. a) What are the disadvantages of array? How to recover them using linked list. Show the representation of linked list in memory including free-storage list. 2+3
- b) Distinguish between overflow and underflow in a linked list. Let LIST be a linked list in memory with successive nodes A and B and node N is to be into the list between A and B. Show the schematic diagram of such an insertion operation. Write a procedure or algorithm to insert an ITEM after a given node A and before node B. 2+4
- c) What is header linked list? Draw a schematic diagram of the two-way list. 3
3. a) Define and demonstrate the following terms in your own words. Binary tree, Complete binary tree, Extended binary tree, and Depth of a tree. Show the sequential representation of binary tree in memory. 4+2
- b) Consider the following tree T, you are asked to simulate the preorder traversal algorithm with T and show the content of STACK at each step. 4



- c) What is the property of binary search tree? Write the formal insertion procedure of heap, INSHEAP (TREE, N, ITEM). Build a heap H from the numbers: 44, 30, 50, 22, 60, 55, 77, 55. 1+2

4. a) Explain divide and conquer algorithms with example. 2
- b) i. Translate by inspection and hand, following infix expression into its equivalent prefix expression: $(A-B)*(D/E)$
ii. Write the algorithm to insert an element into a queue.
- c) Evaluate the following postfix expression using algorithmic steps.

$$P: 3, 1, +, 2, \uparrow, 7, 4, -, 2, *, +, 5, -$$

- d) Consider the following weight matrix W.

$$W = \begin{pmatrix} 7 & 5 & 0 & 0 \\ 7 & 0 & 0 & 2 \\ 0 & 3 & 0 & 0 \\ 4 & 0 & 1 & 0 \end{pmatrix}$$

Draw weighted graph G. Apply modified Warshall's algorithm to find the shortest path Q.

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in memory as follows:

| NODE | A | B | | E | | D | C |
|------|---|---|---|---|---|---|---|
| NEXT | 7 | 4 | 0 | 6 | 8 | 9 | 2 |
| ADJ | 1 | 2 | | 5 | | 7 | 3 |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | | | | | | 8 |

| DEST | 2 | 6 | 4 | | 6 | 7 | 4 | | 4 | 6 |
|------|----|---|---|---|---|---|---|---|---|----|
| LINK | 10 | 3 | 6 | 0 | 0 | 0 | 0 | 4 | 0 | 0 |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

START=1, AVAILN=5

AVAILE=8

- b) Draw the graph G.
- b) Define complete graph and multigraph. Suppose the nodes of the figure A are stored in memory.

1+3

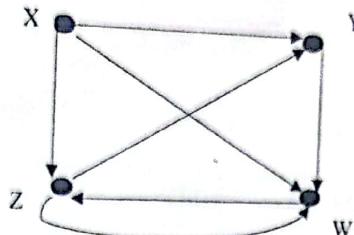
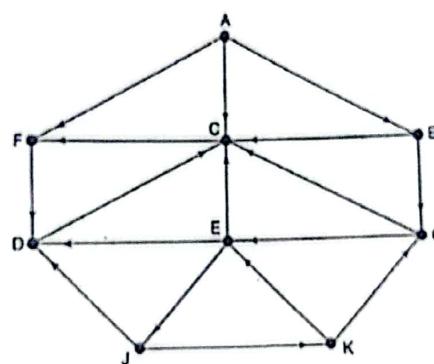


Figure A1

Give the adjacency matrix A of the graph G. Calculate the path matrix P of G.

- c) Consider the following figure. Find and print all the nodes reachable from the node A using DFS.

3



1.5-2.

- d) i) Define topological sort.
ii) Let J and K be integers and suppose Q(J, K) is recursively defined by

$$Q(J, K) = \begin{cases} 5 & ; \text{if } J < K \\ Q(J - K, K + 2) + j & ; \text{if } J \geq K \end{cases}$$

Find Q(2,7) and Q(5,3)

- 6 a) Briefly explain the following terms with respect to data structure and algorithm.

- i) Pseudocode
ii) Algorithm and procedure

- b) i) Give the short notes on Constant time and Logarithmic time complexity with example.
ii) Calculate the complexity of the following segment of code.

```
sum = 0;
for (i=0; i<n*n; i++)
    sum++;
```

- c) Sort the following array of elements by using insertion sort algorithm.
348, 143, 361, 423, 538, 128, 321, 543, 366
d) Write the algorithm for merging two sorted arrays.



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Answer any seven question

- a) What is the importance of software Engineering? Briefly describe what should be steps taken under the process of developing a software system. 3
- b) Explain the principles which play a major role in development of software. 2
- c) Describe the components and quality which is necessary for the documents of software specification. 3
- d) What are the benefits of metrics in software engineering? 2
2. a) Define the blue print methodology. 2
- b) Give the benefits of verification and validation in software development and tell about the techniques of verification and validation in the process of software development. 3
- c) Define the meaning of quality assurance. Explain the role of testing in quality assurance. 3
- d) Write short note on software failure, black box testing, white box testing and stress Testing. 2
3. a) Explain the various types of models which used in software Engineering. 4
- b) Write down the concept of data flow diagram. 2
- c) Describe the objectives of a) coding b) structured programming in terms of software engineering. 2
- d) You have been asked to develop a system that will help with planning large-scale events and parties such as weddings, graduation celebrations, and birthday parties. Using an activity diagram, model the process context for such a system that shows the activities involved in planning a party (booking a venue, organizing invitations, etc.) and the system elements that might be used at each stage 2
4. a) At the end of their study program, students in a software engineering course are typically expected to complete a major project. Explain how the agile methodology may be very useful for the students to use in this case. 3
- b) To reduce costs and the environmental impact of commuting, your company decides to close a number of offices and to provide support for staff to work from home. However, the senior management who introduce the policy is unaware that software is developed using Scrum. Explain how you could use technology to support Scrum in a distributed environment to make this possible. What problems are you likely to encounter using this approach? 3
- c) You have taken a job with a software user who has contracted your previous employer to develop a system for them. You discover that your company's interpretation of the requirements is different from the interpretation taken by your previous employer. Discuss what you should do in such a situation? You know that the costs to your current employer will increase if the ambiguities are not resolved. However, you also have a responsibility of confidentiality to your previous employer. 4

5. a) Why a software project manager require for a software industry? Show the responsibilities of project manager. 2
- b) Briefly describe the project planning, scope management and project estimation in terms of software management activities. 3
- c) Write short note about project scheduling, resource management, project communication management, configuration management. 3
- d) Suppose you are a project manager of XYZ software development team. Company authority asks you to present a project schedule for a client. Draw a Gantt chart and PERT chart for that software scheduling. 2
6. a) What is Entity-Relationship model? Define data dictionary and show the requirement of data dictionary. 3
- b) Differentiate among software design strategies like structured design, function oriented design and object oriented design. 3
- c) Compare between Top-down design and Bottom-up design. 2
- d) Show the user interface design activities. 2
7. a) List out the characteristics of good software. 2
- b) Discuss about the Big Bang model with its advantage and disadvantage. Show the V-Model structure. 4
- c) Describe about the data flow diagram components with their three levels of architecture. 4
- Or**
Write down each of the clauses in the ACM/IEEE Code of ethics for software engineers.
8. a) Imagine that a government wants a software program that helps to keep track of the utilization of the country's vast mineral resources. Although the requirements put forward by the government were not very clear, a software company was tasked with the development of a prototype. The government found the prototype impressive, and asked it be extended to be the actual system that would be used. Discuss the pros and cons of taking this approach 3
- b) Suggest the most appropriate generic software process model that might be used as a basis for managing the development of the following systems. Explain your answer according to the type of system being developed: 4
- A system to control antilock braking in a car
 - A virtual reality system to support software maintenance
 - A university accounting system that replaces an existing system
 - An interactive travel planning system that helps users plan journeys with the lowest environmental impact
- c) Should there be a separate profession of 'software architect' whose role is to work independently with a 3
- separate software system architecture? A separate software company would then

Patuakhali Science and Technology University

B.Sc. Engg(CSE) 3rd Semester (Level-2, Semester-I) F-Removal Examination-2020 (Jan-June)

Course Code: EEE 211 Course Title: Electrical Technology

Credit Hour: 3.0

Full Marks: 70

Duration: 3 Hours.

[Figures in the right margin indicate full marks. Split answering of any question is not recommended]
Answer any 5 of the following questions

- [1] a. Define polyphase circuits. Why do we use polyphase circuits instead of single phase? 03
b. What are the interconnections of three phase circuits? Describe Star connection of three phase circuit to find line and phase current. 05
c. A 320v, 3-phase voltage is applied to a balanced delta connected 3-phase load of phase impedance $(6+j3)\Omega$. Find the phasor current in each line, power consumed in each phase, and phasor sum of three-line currents. 08
- [2] a. Derive the power equation of 3-wire 3-phase system. 06
b. "The impedance in star connected circuit is equivalent to one-third of the impedance in delta connected circuit". Justify the statement. 05
- [3] a. Define electric generator. Derive the E.M.F. equation of D.C. generator. 05
b. What are the losses of D.C. generator? For a D.C. generator, justify the expression $\eta_c = \eta_m + \eta_e$, where, all symbols represent proper meanings. 06
c. An 8-pole, lap-wound armature rotated at 250 r.p.m. is required to generate 320 V. The useful flux per pole is 0.06 wb. If the armature has 200 slots, calculate the number of conductors per slot. 03
- [4] a. What is D.C. motor? Explain the expression $T_a = I_a^2$, where symbols denote appropriate meanings. 05
b. The armature of a 6-pole, 600 r.p.m. lap-wound generator has 150 slots. If each coil has 4 turns, calculate the flux per pole required to generate an e.m.f. of 250 volts. 02
c. Write down the key characteristics of a D.C. motor. 02
- [5] a. "The efficiency of a D.C. generator will be maximum when the load current is such that variable loss is equal to the constant loss". Justify the statement with appropriate symbols. 06
b. Define back E.M.F. Write down the significance of back E.M.F. 05
c. "The mechanical power developed by the motor is maximum when back E.M.F. is equal to half of the applied voltage". Explain the statement with appropriate symbols. 03
- [6] a. Define logic analyzer. Classify and describe different types of logic analyzer. 07
b. Differentiate between logic analyzer and oscilloscope. Write down the key characteristics of logic analyzer. 07

Patuakhali Science and Technology University

Department of Computer Science and Information Technology

Special Repeat Examination of July-December 2020

8th Semester (Level-4, Semester-II) in B.Sc. Engg. (CSE)

Course Title: Data Structure and Algorithms

Enlist:

Course Code: CIT-211

Credit Hour: 3.00

Session: 2016-17

Full Marks: 70

Duration: 3 Hours

Answer any

Figure in the right margin indicates full marks. Split answering of any question is not recommended.
Answer any 5 of the following questions.

1 a) What is recursion? Distinguish between linear and nonlinear data structure. 2+2

b) i) Translate, by inspection and hand, each infix expression into its equivalent postfix expression:

$$A * (B + D) / E - F * (G + H / K)$$

ii) Sort the following array of elements by using radix sort algorithm.
348, 12, 143, 361, 423, 538, 128, 321, 543, 99

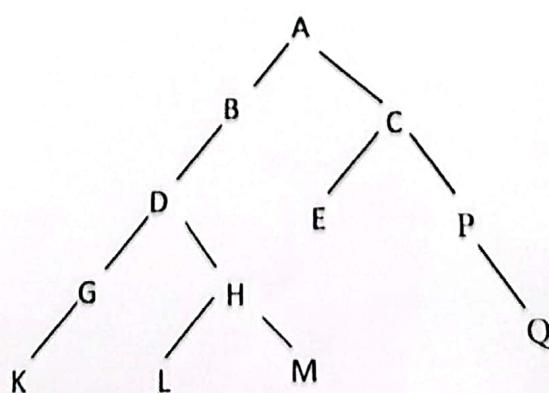
c) Differentiate between stack and queue. Write a procedure to insert an element to the stack. 2+

2 a) Draw the weighted graph for the given adjacency matrix. The values in the matrix represent weight of the edge and zero value represent no edge. You have to label the vertices like A, B, C, G.

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 5 | 3 | 0 | 0 | 0 | 5 |
| 5 | 0 | 0 | 6 | 0 | 7 | 0 |
| 3 | 0 | 0 | 0 | 8 | 6 | 0 |
| 0 | 6 | 0 | 0 | 0 | 0 | 7 |
| 0 | 8 | 0 | 0 | 0 | 3 | 0 |
| 0 | 7 | 6 | 0 | 3 | 0 | 0 |
| 6 | 0 | 7 | 0 | 0 | 0 | 0 |

b) Apply BFS and DFS on the graph you get in the answer to the (a). Start from node A and stop when you find node E. Show a step-by-step demonstration of BFS and DFS.

c) Define 2-tree. Simulate (step-by-step processing) the inorder traversing mechanism of the following tree.



a) Make a maxheap from the following list of elements.

11, 50, 80, 5, 22, 53, 3, 15, 23

b) i) Give the complexity of quick sort, selection sort, and insertion sort.

ii) Explain the quick sort process for sorting the following list of elements.

348, 12, 143, 361, 423, 538, 128, 321, 543, 99

c) Build a Huffman tree from the list of elements.

| Item | Weight | A | B | C | D | E | F | G |
|-------|--------|---|---|----|----|---|----|----|
| REDML | 21 | | 5 | 25 | 15 | 8 | 12 | 11 |

- 7) What is a linear array? Write the operation of linear data structure. Illustrate the representation of linear memory.
- b) Mention the key concept of the Bubble sort algorithm. Suppose, the following numbers need to be sorted 32, 51, 27, 85, 66, 23, 13, 57, you apply the Bubble sort algorithm to make the ascending order of the numbers. Write the complexity of this algorithm.
- c) What are the advantages of using a pointer in an array? Show the representation of records in memory using a parallel array. State the steps of the matrix multiplication algorithm. How to compute the complexity of matrix multiplication.

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- 5 a) Define the linked list with an example. List the disadvantages of the array. How to address the limitation using a linked list. Demonstrate the linked list in memory. How to determine the overflow and underflow for performing the operation of data structure.
- b) Write an algorithm that inserts an ITEM after a given node. Show a schematic diagram of middle node deletion.
- c) What is the header linked list? Illustrate a header linked list in memory. Draw a schematic structure of a two-way circular header list.

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- 6 a) Define in your own words the following terms: binary tree, ancestor of a node, descendant of a node, depth of a tree.
- b) Write the formal insertion procedure of heap, INSHEAP (TREE, N, ITEM). Build tree, T, using binary search tree algorithm from the numbers: 44, 30, 50, 22, 60, 55, 77, 55.
- c) Fully describe the insertion sort algorithm with complexity.

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