


GOVERNMENT COLLEGE OF ENGINEERING, JALGAON
(An Autonomous Institute of Government of Maharashtra)

National Highway No.6, JALGAON - 425 002

Name of Examination : **Summer 2023**Course Code & Course Name : **CO353U - Design and Analysis Of Algorithms**Maximum Marks : **60**Duration : **3 Hrs****Instructions:**

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data, if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.

1) Solve any two sub questions

- a) Define algorithm and Describe the characteristics of algorithm with an example. [06]
 b) Explain Space & Time Complexity with example. [06]
 c) Explain Asymptotic notation. [06]

2) Solve any two sub questions

- a) Write the quick sort algorithm and analyze its time complexity. [06]
 b) Explain recursive binary search with an example. [06]
 c) Write the merge sort algorithm and analyze its time complexity. [06]

3) Solve any two sub questions

- a) Explain prim's algorithm. [06]
 b) Explain Kruskal's algorithm. [06]
 c) Explain floyd-warshall algorithm with an example. [06]

4)

- a) What is back tracking and explain 8 queens problem. [06]
 b) Write short note on- hamiltonian cycles [06]

5)

- a) Explain binary search tree with example. [06]
 b) Difference between NP-hard and NP-complete problem. [06]

All the best!



GOVERNMENT COLLEGE OF ENGINEERING, JALGAON

(An Autonomous Institute of Government of Maharashtra)

National Highway No.6, JALGAON - 425 002



Name of Examination : **Summer 2024**

Course Code & Course Name : **CO353U - Design and Analysis Of Algorithms**

Maximum Marks : **60**

Duration : **3 Hrs**

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data, if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks followed by corresponding Course Outcomes (CO) and revised Bloom's Taxonomy level (L1 to L6).

1) Solve any two of the following

a) Find the time complexity of following recurrence relation using Master theorem. [06][CO2][L5]

$$i) T(n) = T(\sqrt{n}) + \log n$$

$$ii) T(n) = 2T(\sqrt{n}) + \log n$$

$$iii) T(n) = 2T(\sqrt{n}) + 1$$

b) i) Is $2^{n+1} = O(2^n)$? Is $2^{2n} = O(2^n)$? Justify [06][CO2][L3]

ii) Solve using Recursion Tree method

$$T(n) = 3T(n/4) + n^2$$

c) Write an algorithm to find the maximum and minimum element in an array A storing n integers. What is running time of this algorithm for computing maximum elements of an array of integers. [06][CO1][L5]

2) Solve any two of the following

a) Write Greedy Algorithm for fractional Knapsack Problem. Also find the optimal solution for the following fractional Knapsack problem. [06][CO3][L4]

$$n=4, m = 60, W=\{40, 10, 20, 24\} \text{ and } P=\{280, 100, 120, 120\}$$

b) Illustrate the working of merge sort algorithm on a input instances: [06][CO3][L4]
10, 27, 30, 88, 17, 98, 42, 54, 72, 95.

Also compute the best time complexity of merge sort.

c) A file contains the following characters with frequencies as shown. If Huffman coding is used for data compression determine [06][CO2][L5]

i) Huffman code for each character

ii) Average code length

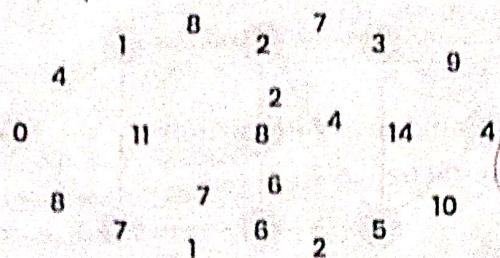
iii) Length of Huffman encoded message (in bit).

| Characters | a | e | i | o | u | s | t |
|-------------|----|----|----|---|---|----|---|
| Frequencies | 10 | 15 | 12 | 3 | 4 | 13 | 1 |

3) Attempt the following questions

[06][CO2][L4]

- a) Write a pseudocode to generate single-source shortest path using Dijkstra's algorithm. Mention its time complexity. Consider the source vertex is 0. Find the shortest path from 0 to all other vertices.



[06][CO2][L3]

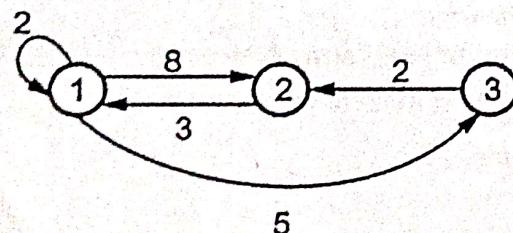
- b) Consider a complete undirected graph with vertex set {0, 1, 2, 3, 4}. Entry w_{ij} in the matrix W below is the weight of the edge (i, j) . What is the Cost of the Minimum Spanning Tree T using Prim's Algorithm in this graph such that vertex 0 is a leaf node in the tree T?

$$W = \begin{pmatrix} 0 & 1 & 8 & 1 & 4 \\ 1 & 0 & 12 & 4 & 9 \\ 8 & 12 & 0 & 7 & 3 \\ 1 & 4 & 7 & 0 & 2 \\ 4 & 9 & 3 & 2 & 0 \end{pmatrix}$$

4) Attempt the following questions

- a) Solve the all-pair shortest path for the following graph using Floyd's algorithm

[06][CO3][L4]



- b) What do you mean by state space tree in backtracking? Draw the state space tree for 4 Queen problems.

[06][CO1][L2]

5) Attempt any two of the following

- a) Define P, NP, NP complete and NP hard Problems.

[06][CO1][L2]

- b) Compare BFS and DFS algorithm with an example graph and denote its time complexities.

[06][CO1][L2]

- c) Write an algorithm to determine the Hamiltonian cycle in a give graph using backtracking.

[06][CO2][L2]

All the best!

Government College of Engineering, Jalgaon

(An Autonomous Institute of Govt. of Maharashtra) Computer
Engineering Department
MSE Question Paper

Class: T, Y, B. Tech.

Sem: EVEN

Subject: CO353U Design and Analysis of Algorithms

Date: 24/03/2023

Duration: 2Hrs

Marks: 30

- NOTE:**
1. Bloom's Taxonomy level is defined as per Revised 2001 model
 2. All Questions are as per course Outcomes
 3. Assume suitable data wherever is required.

Course Outcomes:

1. Apply mathematical principles to solve various problems also to analyze the complexities of various algorithms and select the best.
2. Able to design some algorithms and analyze their performance with respect to selected evaluation parameters
3. Apply different strategies that are known to be useful in finding efficient algorithms to solve problems.
4. Use appropriate data structure and algorithms to solve a particular problem

| Que. No. | Question | Max. Marks | CO Mapped | Bloom's Taxonomy Level |
|-------------------------|---|------------|-----------|------------------------|
| Attempt any six: | | | | |
| 1 | Explain all asymptotic notation used in algorithm analysis | 5 | CO 2 | Applying |
| 2 | Find the time complexity of following recurrence relation using Master theorem i) $T(n)=2T(n/2) + n\log n$ ii) $T(n)=T(\sqrt{n}) + \log n$ iii) $T(n)=T(\sqrt{n}) + c$ | 5 | CO 1 | Understanding |
| 3 | Write recursive binary search algorithm and find time complexity using substitution method. List the applications of binary search. | 5 | CO 1 | Applying |
| 4 | For following list of elements trace the recursive algorithm and finding max and min and determine how many comparison have been made. 22,13,-5,-8,15,60,17,31,47 | 5 | CO 3 | Evaluating |
| 5 | Find the time complexity of following recurrence relation using substitution method. $T(n)=2T(n/2) + \log n$ | 5 | CO 4 | Analyzing |
| 6 | How to apply the Divide and Conquer strategy used for sorting the element using Quick sort with example. Also discuss the complexity of algorithm in average case. | 5 | CO 4 | Analyzing |
| 7 | i) arrange the following in the increasing order of their asymptotic complexity in big theta notation a) $22n, \log n \log n, 2n, \log n!, (3/2)n$ b) $2n, n^{3/2}, n\log n, n \log n$ ii) Explain best case, average case and worst case complexity | 5 | CO 2 | Evaluating |

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Government College of Engineering, Jalgaon
(An Autonomous Institute of Govt. of Maharashtra)
Computer Engineering Department
REMSE Question Paper

Class: T. Y. B. Tech.

Sem: EVEN

Subject: CO353U Design and Analysis of Algorithms

Date: 10/04/2024

Duration: 2Hrs

Marks: 30

- NOTE: 1. Bloom's Taxonomy level is defined as per Revised 2001 model
 2. All Questions are as per course Outcomes
 3. Assume suitable data wherever is required.

Course Outcomes:

1. Apply mathematical principles to solve various problems also to analyze the complexities of various algorithms and select the best.
2. Able to design some algorithms and analyze their performance with respect to selected evaluation parameters
3. Apply different strategies that are known to be useful in finding efficient algorithms to solve problems.
4. Use appropriate data structure and algorithms to solve a particular problem

| Que. No. | Question | Max. Marks | CO Mapped | Bloom's Taxonomy Level |
|----------|---|------------|-----------|------------------------|
| | <u>Five</u> | | | |
| a) | <p>Attempt any three of the following.</p> <p>Consider the following function. Write its time function and calculate the time complexity using substitution method.</p> <pre>int fun1(int n) { if (n <= 1) return n; return 2*fun1(n-1); }</pre> <p>int fun2(int n) { if (n <= 1) return n; return fun2(n-1) + fun2(n-1); }</p> | 06 | 2 | Applying |
| b) | <p>i) Write Dijkstra's Single Source Shortest path algorithm. Analyse the complexity. ii) Find the shortest path from s to all other vertices in the following graph using Dijkstra's Algorithm.</p> | 06 | 3 | Evaluating |
| | <p>i) Is $2^{n+1} = O(2^n)$? Is $2^{2n} = O(2^n)$? Justify ii) Solve using Recursion Tree method $T(n) = 3T(n/4) + n^2$</p> | 06 | 1 | Analyzing |

| | | | | |
|----|---|----|---|------------|
| d) | <p>i) Formulate Fractional Knapsack Problem. Write Greedy Algorithm for fractional Knapsack Problem. ii) Find the optimal solution for the following fractional Knapsack problem. n=4, m = 60, W={40, 10, 20, 24} and P={280, 100, 120, 120}</p> | 06 | 4 | Analyzing |
| e) | <p>Solve using Masters theorem i) $T(n)=2T(n/4)+\sqrt{n}$ ii) $T(n)=7T(n/2)+n^2$</p> | 06 | 1 | Analyzing |
| f) | <p>Consider a complete undirected graph with vertex set {0, 1, 2, 3, 4}. Entry w_{ij} in the matrix W below is the weight of the edge $\{i, j\}$. What is the Cost of the Minimum Spanning Tree T using Prim's Algorithm in this graph such that vertex 0 is a leaf node in the tree T?</p> $W = \begin{bmatrix} 0 & 1 & 8 & 1 & 4 \\ 1 & 0 & 12 & 4 & 9 \\ 8 & 12 & 0 & 7 & 3 \\ 1 & 4 & 7 & 0 & 2 \\ 4 & 9 & 3 & 2 & 0 \end{bmatrix}$ | 06 | 4 | Evaluating |
| g) | <p>Explain in detail quick sorting method. Apply the Quick sort to the list.</p> <p style="text-align: center;">E, X, A, M, P, L, E</p> | 06 | 4 | Evaluating |

Government College of Engineering, Jalgaon
(An Autonomous Institute of Govt. of Maharashtra)
Computer Engineering Department
MSE Question Paper

Class: T. Y. B. Tech.

Subject: CO353U Design and Analysis of Algorithms

Duration: 2Hrs

Sem: EVEN

Date: 20/03/ 2024

Marks: 30

NOTE: 1. Bloom's Taxonomy level is defined as per Revised 2001 model

2. All Questions are as per course Outcomes

3. Assume suitable data wherever is required.

Course Outcomes:

1. Apply mathematical principles to solve various problems also to analyze the complexities of various algorithms and select the best.
2. Able to design some algorithms and analyze their performance with respect to selected evaluation parameters
3. Apply different strategies that are known to be useful in finding efficient algorithms to solve problems.
4. Use appropriate data structure and algorithms to solve a particular problem

| Que. No. | Question | Max. Marks | CO Mapped | Bloom's Taxonomy Level | | | | | | | | | | | | | | | | | | | | | |
|-------------|---|------------|-----------|------------------------|-----|-----|----|----|-----------|-------------|----|----|----|---|---|---------|-----|-----|------|------------|-----|-----|---|------|------------|
| 1) | Attempt any three of the following. | | | | | | | | | | | | | | | | | | | | | | | | |
| a) | Given the jobs, their deadlines and associated profits as shown. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>Jobs</td><td>J1</td><td>J2</td><td>J3</td><td>J4</td><td>J5</td><td>J6</td></tr> <tr><td>Deadlines</td><td>5</td><td>3</td><td>3</td><td>2</td><td>4</td><td>2</td></tr> <tr><td>Profits</td><td>200</td><td>180</td><td>190</td><td>300</td><td>120</td><td>100</td></tr> </table> i) Write the optimal schedule that gives maximum profit. ii) Are all the jobs completed in optimal schedule. iii) What is the maximum earned profit. | Jobs | J1 | J2 | J3 | J4 | J5 | J6 | Deadlines | 5 | 3 | 3 | 2 | 4 | 2 | Profits | 200 | 180 | 190 | 300 | 120 | 100 | 5 | CO 3 | Evaluating |
| Jobs | J1 | J2 | J3 | J4 | J5 | J6 | | | | | | | | | | | | | | | | | | | |
| Deadlines | 5 | 3 | 3 | 2 | 4 | 2 | | | | | | | | | | | | | | | | | | | |
| Profits | 200 | 180 | 190 | 300 | 120 | 100 | | | | | | | | | | | | | | | | | | | |
| b) | A file contains the following characters with frequencies as shown. If Huffman coding is used for data compression determine i) Huffman code for each character ii) Average code length iii) Length of Huffman encoded message (in bit). <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>Characters</td><td>a</td><td>e</td><td>i</td><td>o</td><td>u</td><td>s</td><td>t</td></tr> <tr><td>Frequencies</td><td>10</td><td>15</td><td>12</td><td>3</td><td>4</td><td>13</td><td>1</td></tr> </table> | Characters | a | e | i | o | u | s | t | Frequencies | 10 | 15 | 12 | 3 | 4 | 13 | 1 | 5 | CO 3 | Evaluating | | | | | |
| Characters | a | e | i | o | u | s | t | | | | | | | | | | | | | | | | | | |
| Frequencies | 10 | 15 | 12 | 3 | 4 | 13 | 1 | | | | | | | | | | | | | | | | | | |
| c) | Find the time complexity of following recurrence relation. $T(n) = \sqrt{n} T(\sqrt{n}) + n$ | 5 | CO 1 | Applying | | | | | | | | | | | | | | | | | | | | | |
| d) | Find the time complexity of following recurrence relation using Master theorem. i) $T(n) = T(\sqrt{n}) + \log n$ ii) $T(n) = 2T(\sqrt{n}) + \log n$ iii) $T(n) = 2T(\sqrt{n}) + 1$ | 5 | CO 1 | Applying | | | | | | | | | | | | | | | | | | | | | |

| 2) | Attempt any three of the following. | | | | | | | | | | | | | | | | | |
|-------------|---|--------|------|------------|------|------|---|---|-------------|------|------|------|------|------|------|-------|-----|------------|
| a) | Write an algorithm for Merge sort. Write its Time function and analyses its complexity using recurrence tree method. | 5 | CO 4 | Analyzing | | | | | | | | | | | | | | |
| b) | Define spanning tree. Compute a minimum cost spanning tree for the following graph using kruskal's algorithm. | 5 | CO 4 | Evaluating | | | | | | | | | | | | | | |
| c) | <p>Write a pseudocode to generate single-source shortest path using Dijkstra's algorithm. Mention its time complexity. Consider the source vertex is 0. Find the shortest path from 0 to all other vertices.</p> <pre> graph LR 0 --- 1[1] 0 --- 7[7] 0 --- 5[5] 1 --- 2[2] 1 --- 3[3] 2 --- 3 2 --- 4[4] 3 --- 4 3 --- 5 4 --- 5 4 --- 6[6] 4 --- 7 5 --- 6 5 --- 7 6 --- 7 6 --- 8[8] 7 --- 8 7 --- 9[9] 8 --- 9 8 --- 5 9 --- 5 </pre> | 5 | CO2 | Analyzing | | | | | | | | | | | | | | |
| d) | <p>i) How many times is the comparison $i \leq n$ performed in the following program?</p> <pre> int i = 60, n = 300; main(){ while (i <= n){ i = i+2; n = n-3; } } </pre> <p>ii) An undirected graph G on 30 vertices has 4 connected components. What is the minimum number of edges in G?</p> <p>iii) We have a body of text that uses six letters A,B,C,D,E,F. The following table has the number of occurrences of each letter.</p> <table border="1"> <thead> <tr> <th>Letter</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>E</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>Occurrences</td> <td>8000</td> <td>6000</td> <td>5000</td> <td>4000</td> <td>3000</td> <td>1000</td> </tr> </tbody> </table> <p>We build a Huffman code based on these frequencies. How many bits will we need to represent the message "FADE"?</p> | Letter | A | B | C | D | E | F | Occurrences | 8000 | 6000 | 5000 | 4000 | 3000 | 1000 | 2+1+2 | CO2 | Evaluating |
| Letter | A | B | C | D | E | F | | | | | | | | | | | | |
| Occurrences | 8000 | 6000 | 5000 | 4000 | 3000 | 1000 | | | | | | | | | | | | |



GOVERNMENT COLLEGE OF ENGINEERING, JALGAON

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National Highway No.6, JALGAON - 425 002



Name of Examination : **Summer 2024**

Course Code & Course Name : **CO351U - Software Project Management**

Maximum Marks : **60**

Duration : **3 Hrs**

Instructions:

1. All questions are compulsory. All Questions carry 12 marks each
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data, if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks followed by corresponding Course Outcomes (CO) and revised Bloom's Taxonomy level (L1 to L6).

1) Answer any two

- a) What is a project? What are its main attributes? Explain any three attributes of project with detailed justification [6][CO1][L2]
- b) Explain project triple constraints. Justify that any change to one constraint will impact the other two.... [6][CO1][L4]
- c) What are suggested skills for all project managers? [4][CO1][L2]
- d) Explain the project management knowledge areas [4][CO1][L2]

2) Answer any two

- a) What are the four frames of organizations? [6][CO1][L2]
- b) What is a project charter? Explain the purposes of it. [6][CO1][L2]
- c) What is a project life cycle? Explain various stages of the project life cycle? [4][CO2][L2]

3) Answer any two

- a) What is Project Management Plan and its content ? [6][CO1][L2]
- b) Explain the processes involved in project Integration management. [6][CO2][L2]
- c) What is Strategic Planning? Discuss SWOT analysis. [4][CO3][L2]

4) Answer any two

- a) i> With AOA Network diagram, how activity is scheduled
ii> What are task task dependencies, how tasks are linked. [8][CO3][L4]
- b) What is scope? Explain the steps involved in Project Scope Management. [4][CO2][L2]
- c) Explain the steps involved in project time management. [4][CO2][L2]

5) Answer any two

- a) With diagram, how cause and effect diagram and pareto diagram helps in quality management. [8][CO4][L3]
- b) Enlist different tools and techniques for estimating cost of software explain any two of them. [6][CO2][L2]
- c) Explain the processes in Project Quality Management. [4][CO4][L2]
- d) What is risk. State the steps in risk management. [4][CO1][L2]

**GOVERNMENT COLLEGE OF ENGINEERING, JALGAON**

(An Autonomous Institute of Government of Maharashtra)

National Highway No.6, JALGAON - 425 002



Name of Examination : Summer 2024

Course Code & Course Name : CO352U - Finance Management and Information System

Maximum Marks : 60

Duration : 3 Hrs

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Figures to the right indicate full marks followed by corresponding Course Outcomes (CO) and revised Bloom's Taxonomy level (L1 to L6).

- | | |
|--|---------------|
| 1) Solve any TWO sub questions. | [12] |
| a) Explain systems approach to management process. | [6] [CO1][L2] |
| b) Explain in details any 6 functions of manager. | [6] [CO4][L2] |
| c) What is performance Appraisal. Explain it with its objectives and advantages. | [6] [CO1][L2] |
| 2) Solve any TWO sub questions. | [12] |
| a) Explain acquisitions and takeovers in detail. | [6] [CO2][L2] |
| b) Explain 6 fundamental principles of finance. | [6] [CO2][L1] |
| c) Write a short note on: i) Privatization, ii) Debentures | [6] [CO2][L2] |
| 3) Solve any TWO sub questions. | [12] |
| a) Explain E business along with its Advantages, Disadvantages and Challenges of E Business. | [6] [CO3][L4] |
| b) What is Merger. State and explain its types. | [6] [CO2][L2] |
| c) What is Management Information System? What is the role of MIS in decision making? | [6] [CO1][L4] |
| 4) Solve ALL sub questions. | [12] |
| a) Write short note on: Supply Chain Management | [6] [CO5][L2] |
| b) Explain all four models of E business. | [6] [CO1][L2] |
| 5) Solve ALL sub questions. | [12] |
| a) What is the impact of Information Technology on society. | [6] [CO1][L4] |
| b) What are the Information Security Challenges in E -Enterprise. | [6] [CO3][L4] |

All the best!



GOVERNMENT COLLEGE OF ENGINEERING, JALGAON

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National Highway No.6, JALGAON – 425 002



Name of Examination : Summer 2023

Course Code & Course Name : CO352U - Finance Management and Information System

Maximum Marks : 60

Duration : 3 Hrs

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data, if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.

1) Solve any two sub-questions

- a) Discuss systems approach to management. [6]
- b) Explain performance appraisal and career strategies. [6]
- c) Discuss social responsibilities of manager. [6]

2) Solve any two sub-questions

- a) Explain the following terms: [6]
 - i) Mergers and acquisition
 - ii) Shares and debentures
- b) Explain different forms of business organisation. [6]
- c) Explain balance sheet with example. [6]

3) Solve any two sub-questions

- a) Discuss strategic design of MIS. [6]
- b) Discuss the role of MIS in an organisation. [6]
- c) Explain Enterprise Resource Planning. [6]

4) Solve all sub-questions

- a) Explain E-commerce models. [6]
- b) What is real time enterprise? What are the technology options for becoming a real time enterprise ? [6]

5) Solve all sub-questions

- a) Explain IPR law. [6]
- b) Discuss global business IT strategies and applications. [6]

All the best!



GOVERNMENT COLLEGE OF ENGINEERING, JALGAON

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National Highway No.6, JALGAON - 425 002



Name of Examination : **Summer 2023**

Course Code & Course Name : **CO354UB - Internet Of Things**

Maximum Marks : **60**

Duration : **3 Hrs**

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data, if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks followed by corresponding Course Outcomes (CO) and revised Bloom's Taxonomy level (L1 to L6).

- 1) Solv any two questions
 - a) What is physical design of IoT? [6] [CO1] [L1]
 - b) Draw and explain Functional Blocks of IoT. [6] [CO2] [L2]
 - c) Differentiate between IoT and M2M. [6] [CO3] [L3]
- 2) Solv any two questions
 - a) How SDN is used in IoT? [6] [CO2] [L5]
 - b) What are Wireless medium access issues in IoT. [6] [CO1] [L2]
 - c) Enlist and explain Routing Protocol for IoT. [6] [CO2] [L3]
- 3) Solv any two questions
 - a) What are the design challenges of IoT? [6] [CO4] [L2]
 - b) What are the main security challenges of IoT? [6] [CO3] [L2]
 - c) What is resource management in IoT? [6] [CO1] [L2]
- 4) a) What is software agent in IoT? [6] [CO4] [L3]
- b) What is meant by data synchronization? Explain different synchronization types. [6] [CO5] [L4]
- 5) a) What is python? Why is python good for IoT? [6] [CO2] [L3]
- b) Give and explain an example of a IoT business model? [6] [CO5] [L6]

All the best!

3. Recognize process by which various management techniques

Government College of Engineering, Jalgaon
Computer Engineering Department
ReMSE Question Paper

Class: TY B.Tech.

Sem: Even

Subject: CO354UB Internet of Things

Date: 9/4/2024

Duration: 2Hrs

Marks: 30

NOTE: 1. Bloom's Taxonomy level is defined as per Revised 2001 model.

2. All Questions are as per course Outcomes.

3. Assume suitable data wherever is required.

Course Outcomes:

- 1 Explain the fundamental concepts of the Internet of Things.
2. Discuss resource management in IoT.
3. Use various IoT protocols to design real life IoT applications.
4. Develop IoT concepts using Python and various IoT tools.

| Que. No. | Question | Ma x. Ma rks | CO Mapped | Blooms Tax onomy Level |
|---------------------|---|---------------------------------|----------------------|---------------------------------------|
| Q.1 | Attempt any two | | | |
| a) | Explain building blocks of IoT. | 3 | CO1 | Understand |
| b) | Discuss how M2M communication forms the foundation for IoT . | 3 | CO1 | Understand |
| c) | Discuss the benefits and challenges in implementing IoT technology. | 3 | CO1 | Understand |

| | | | | |
|-------------|--|---|----------|------------|
| Q.2 | Attempt any one | | | |
| a) | What is logical design of an IoT? Explain IoT communication APIs with their use. | 6 | CO1, CO3 | Understand |
| b) | What are various layers in IoT architecture? Discuss the function of each layer. Also mention the protocols used at these layers. | 6 | CO1, CO3 | Understand |
| Q. 3 | Attempt all | | | |
| a) | Discuss wireless medium access issues in detail. | 6 | CO3 | Understand |
| b) | Explain any 3 long range MAC protocols with their specific application. | 6 | CO1 | Understand |
| x) | Explain SDN technology. How does it differ from traditional networking? Discuss the role of SDN controller, and open APIs used in SDN. | 6 | CO3 | Understand |

Government College of Engineering, Jalgaon

(An Autonomous Institute of Govt. of Maharashtra)

Computer Department

MSE Question Paper

Class: T. Y. B. Tech.

Sem: Even

Subject: CO 352U Finance and Management Information System

Date: 23/ 03/ 2024

Duration: 2Hrs

Marks: 30

NOTE: 1. Bloom's Taxonomy level is defined as per Revised 2001 model

2. All Questions are as per course Outcomes

3. Assume suitable data wherever is required.

Course Outcomes:

1. demonstrate effective MIS and DSS reports.
2. demonstrate effective analytical and critical thinking skills to make an appropriate business-related decision.
3. distinguish and analyse ethical problems that occur in business and society.
4. apply leadership skills and competencies in business situations.
5. apply current technologies and decision-support tools for business operations.

| Que No. | Question | Max | CO Mapped | Bloom's Taxonomy Level |
|---------|---|-----|-----------|------------------------|
| 1 | Attempt any two: | | | |
| a | State and explain any three social responsibilities of Manager. | 3 | CO 4 | Application |
| b | What is System approach to management. Explain with diagram. | 3 | CO 2 | Understanding |
| c | State and explain the goals of financial management. | 3 | CO 3 | Understanding |
| 2 | Attempt any one: | | | |
| a | State and explain the financial manager's responsibilities. | 6 | CO 3 | Application |
| b | What is Partnership. State advantages and disadvantages of Partnership. | 6 | CO 4 | Understanding |
| 3 | Attempt all | | | |
| a | Explain six fundamental principles of finance. | 6 | CO 2 | Understanding |
| b | State and explain in details any 6 functions of managers. | 6 | CO 4 | Application |
| c | Explain advantages of Performance appraisal. | 6 | CO 2 | Understanding |

Government College of Engineering, Jalgaon

(An Autonomous Institute of Govt. of Maharashtra)

Computer Department

MSE Question Paper

Class: T. Y. B. Tech.

Sem: Even

Subject: CO 352U Finance and Management Information System

Date: 23/03/2023

Duration: 2Hrs

Marks: 30

NOTE: 1. Bloom's Taxonomy level is defined as per Revised 2001 model

2. All Questions are as per course Outcomes

3. Assume suitable data wherever is required.

Course Outcomes:

1. demonstrate effective MIS and DSS reports.
2. demonstrate effective analytical and critical thinking skills to make an appropriate business-related decision.
3. distinguish and analyse ethical problems that occur in business and society.
4. apply leadership skills and competencies in business situations.
5. apply current technologies and decision-support tools for business operations.

| Que No. | Question | Max | CO Mapped | Bloom's Taxonomy Level |
|---------|---|-----|-----------|------------------------|
| 1 | Attempt any two: | | | |
| a | State and explain any 3 Social responsibilities of Manager. | 3 | CO 4 | Application |
| b | State and explain the goals of financial management. | 3 | CO 3 | Understanding |
| c | What is System approach to management. Explain with diagram. | 3 | CO 2 | Understanding |
| 2 | Attempt any one: | | | |
| a | Explain 6 fundamental principles of finance. | 6 | CO 2 | Understanding |
| b | State and explain advantages of Performance appraisal. | 6 | CO 2 | Understanding |
| 3 | Attempt all | | | |
| a | Explain in details the functions of managers. (any 6) | 6 | CO 4 | Application |
| b | State and explain the financial manager's responsibilities. | 6 | CO 3 | Application |
| c | What is Partnership. State advantages and disadvantages of Partnership. | 6 | CO 4 | Understanding |

Government College of Engineering, Jalgaon

(An Autonomous Institute of Govt. of Maharashtra)

Computer Department

Re-MSE Question Paper

Class: T. Y. B. Tech.

Sem: Even

Subject: CO 352U Finance and Management Information System

Date: 22/05/2023

Duration: 2Hrs

Marks: 30

NOTE: 1. Bloom's Taxonomy level is defined as per Revised 2001 model

2. All Questions are as per course Outcomes

3. Assume suitable data wherever is required.

Course Outcomes:

1. demonstrate effective MIS and DSS reports.
2. demonstrate effective analytical and critical thinking skills to make an appropriate business-related decision.
3. distinguish and analyse ethical problems that occur in business and society.
4. apply leadership skills and competencies in business situations.
5. apply current technologies and decision-support tools for business operations.

| Que No. | Question | Max | CO Mapped | Bloom's Taxonomy Level |
|---------|---|-----|-----------|------------------------|
| 1 | Attempt any two: | | | |
| a | What is System approach to management. Explain with diagram. | 3 | CO 2 | Understanding |
| b | State and explain any three social responsibilities of Manager. | 3 | CO 4 | Application |
| c | State and explain the goals of financial management. | 3 | CO 3 | Understanding |
| 2 | Attempt any one: | | | |
| a | State and explain the financial manager's responsibilities. | 6 | CO 3 | Application |
| b | What is Partnership. State advantages and disadvantages of Partnership. | 6 | CO 4 | Understanding |
| 3 | Attempt all | | | |
| a | Explain advantages of Performance appraisal. | 6 | CO 2 | Understanding |
| b | State and explain in details any 6 functions of managers. | 6 | CO 4 | Application |
| c | Explain six fundamental principles of finance. | 6 | CO 2 | Understanding |

Government College of Engineering, Jalgaon
Computer Engineering Department
MSE Question Paper

**Class: TY B.Tech Computer
 Subject: CO354UB Internet of Things
 Duration: 2Hrs**

**Sem: Even
 Date: 18/ 03/ 2024
 Marks: 30**

- NOTE: 1. Bloom's Taxonomy level is defined as per Revised 2001 model.
 2. All Questions are as per course Outcomes.
 3. Assume suitable data wherever is required.*

Course Outcomes:

1. Explain the fundamental concepts of Internet of Things.
2. Discuss resource management in IoT.
3. Use various IoT protocols to design real life IoT applications.
4. Develop IoT concepts using Python and various IoT tools.

| Que. No. | Question | Max. Marks | CO Mapped | Bloom's Taxonomy Level |
|----------|--|------------|-----------|------------------------|
| Q.1 | <i>Attempt any two</i> | | | |
| a) | Define IoT. Discuss its significance in real word applications. | 3 | CO1 | Understand |
| b) | Discuss the potential benefits and drawbacks of widespread adoption of the Internet of Things. | 3 | CO1 | Understand |
| c) | Discuss M2M technology with its applications. How it is different from IoT? | 3 | CO1 | Understand |

| | | | | |
|-------------|--|---|---------|------------|
| Q.2 | <i>Attempt any one</i> | | | |
| a) | Describe the layered architecture of IoT with a neat diagram. State the protocols used at each layer. | 6 | CO1,CO3 | Understand |
| b) | Explain IoT communication models with their applications. | 6 | CO1,CO3 | Understand |
| Q. 3 | <i>Attempt all</i> | | | |
| a) | Discuss the role of application layer in IoT architecture. Explain the importance of communication protocols in IoT. Describe the communication protocols used at application layer. | 6 | CO3 | Understand |
| b) | What is SDN? Describe the components of SDN architecture. Identify the benefits and challenges of implementing SDN. | 6 | CO1 | Understand |
| c) | Explain the following Short Range MAC Layer Protocols: a)RFID b) Zigbee c) 6LOWPAN | 6 | CO3 | Understand |

Government College of Engineering, Jalgaon

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Computer Engineering Department

MSE Question Paper

Class: TY B.Tech.

Subject: CO354UB Internet of Things

Duration: 2Hrs

Sem: Even

Date: 28/ 03/ 2023

Marks: 30

NOTE: 1. Bloom's Taxonomy level is defined as per Revised 2001 model.

2. All Questions are as per course Outcomes.

3. Assume suitable data wherever is required.

Course Outcomes:

- Understand the fundamentals and the application areas of IoT.
- Understand the revolution of the internet in mobile devices, cloud and sensor networks.
- Understand building blocks of the internet of things and characteristics.

| Que. No. | Question | Max. Marks | CO Mapped | Blooms Taxonomy Level |
|----------|---|------------|-----------|-----------------------|
| Q.1 | Attempt any two | | | |
| a) | Define Internet of Things (IoT)? Discuss how cloud computing plays a key role in IoT? | 3 | CO1 | Remember |
| b) | Describe the characteristics of IoT. | 3 | CO3 | Understand |
| c) | Discuss the role of communication protocols in IoT. Explain 6LoWPAN in brief. | 3 | CO2 | Understand |

| | | | | |
|--|---|---|-----|------------|
| Q.2 | <i>Attempt any one</i> | | | |
| a) | Explain the layered architecture of IoT with a neat diagram. | 6 | CO1 | Understand |
| <input checked="" type="checkbox"/> b) | Explain Software Defined Networking in detail. | 6 | CO1 | Understand |
| Q. 3 | <i>Attempt all</i> | | | |
| <input checked="" type="checkbox"/> a) | Explain with example MQTT Protocol. Why MQTT is well-suited for IoT applications? | 6 | CO1 | Understand |
| <input checked="" type="checkbox"/> b) | Explain communication models in IoT. | 6 | CO1 | Understand |
| <input checked="" type="checkbox"/> c) | Discuss how M2M is different from IoT. | 6 | CO1 | Understand |

Government College of Engineering, Jalgaon
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 Computer Department
 MSE Question Paper

Class: T. Y. B. Tech.

Subject: CO 351U Software Project Management

Duration: 2Hrs

Sem: Odd

Date: 22/03/2024

Marks: 30

NOTE: 1. Bloom's Taxonomy level is defined as per Revised 2001 model

2. All Questions are as per course Outcomes
3. Assume suitable data wherever is required.

Course Outcomes:

1. able to practice project development principles while developing software.
2. able to understand project management in terms of the software development process.
3. able to do strategic project planning.
4. able to perform project quality management using tools and techniques for quality control.

| Qu. e. No. | Question | Max. Marks | CO Mappe d | Blooms Taxonomy Level |
|------------------|--|---------------|------------------|-----------------------------|
| 1 | Attempt any two: | | | |
| a | What is Project? State and explain the triple constraints. | 3 | CO 1 | Understand |
| b | Explain the role and responsibilities of a project manager. | 3 | CO 1 | Understand |
| c | Explain typical organizational structure of software organization. | 3 | CO 2 | Understand |
| 2 | Attempt any one: | | | |
| a | State and explain the Project Attributes. | 6 | CO 1 | Remember |
| b | State and Explain the four frames of organization. | 6 | CO 3 | Understand |
| 3 | Attempt all | | | |
| a | Enlist the Project Management Knowledge areas and list the tools in the respective knowledge area. | 6 | CO 3 | Apply |
| b | Explain the three sphere model for systems management. | 6 | CO 2 | Understand |
| c | Enlist the top skills every project manager should have. Explain any four of them. | 6 | CO 1 | Understand |

Bloom's Taxonomy level is defined as per course Outcomes

Government College of Engineering, Jalgaon

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MSE Question Paper

Class: T. Y. B. Tech.

Sem: Odd

Subject: CO 351U Software Project Management

Date: 29/03/2023

Duration: 2Hrs

Marks: 30

NOTE: 1. Bloom's Taxonomy level is defined as per Revised 2001 model

2. All Questions are as per course Outcomes

Course Outcomes:

- able to practice project development principles while developing software.
- able to understand project management in terms of the software development process.
- able to do strategic project planning.
- able to perform project quality management using tools and techniques for quality control.

| Que. No. | Question | Max. Marks | CO Mapped | Blooms Taxonomy Level |
|----------|--|------------|-----------|-----------------------|
| 1 | Attempt any two: a) What is Project? State and explain the triple constraints. b) State and Explain the four frames of organization. c) Explain the role of the project Manager | 3 | CO 2 | Understanding |
| | | 3 | CO 2 | Understanding |
| | | 3 | CO 1 | Remembering |

| | | | | |
|----------|---|---|------|---------------|
| 2 | Attempt any one: | | | |
| a | Explain the Project Management Knowledge areas. | 6 | CO 3 | Understanding |
| b | Enlist the top skills every project manager should have. | 6 | CO 3 | Understanding |
| 3 | Attempt all | | | |
| a | State and explain the Project Attributes. | 6 | CO 3 | Understanding |
| b | Explain the three sphere model for systems management | 6 | CO 2 | Applying |
| c | Explain Project Management Tools And Techniques by Knowledge areas. | 6 | CO 4 | Analyzing |

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Government College of Engineering, Jalgaon

(An Autonomous Institute of Govt. of Maharashtra)

Computer Department

RE-MSE Question Paper

Class: T. Y. B. Tech.

Sem: Even

Subject: CO 352U Finance and Management Information System

Date: 11/04/2024

Duration: 2Hrs

Marks: 30

NOTE: 1. Bloom's Taxonomy level is defined as per Revised 2001 model

2. All Questions are as per course Outcomes

3. Assume suitable data wherever is required.

Course Outcomes:

1. demonstrate effective MIS and DSS reports.
2. demonstrate effective analytical and critical thinking skills to make an appropriate business-related decision.
3. distinguish and analyse ethical problems that occur in business and society.
4. apply leadership skills and competencies in business situations.
5. apply current technologies and decision-support tools for business operations.

| Que No. | Question | Max | CO Mapped | Bloom's Taxonomy Level |
|---------|---|-----|-----------|------------------------|
| 1 | Attempt any two: | | | |
| a | State and explain any 3 Social responsibilities of Manager. | 3 | CO 4 | Application |
| b | State and explain the goals of financial management. | 3 | CO 3 | Understanding |
| c | What is System approach to management. Explain with diagram. | 3 | CO 2 | Understanding |
| 2 | Attempt any one: | | | |
| a | Explain Decision Support System. | 6 | CO 2 | Understanding |
| b | State and explain advantages of Performance appraisal. | 6 | CO 2 | Understanding |
| 3 | Attempt all | | | |
| a | Explain in details the functions of managers. (any 6) | 6 | CO 4 | Application |
| b | Explain Business Process Engineering. | 6 | CO 3 | Understanding |
| c | What is Partnership. State advantages and disadvantages of Partnership. | 6 | CO 4 | Understanding |

Government College of Engineering, Jalgaon

(An Autonomous Institute of Govt. of Maharashtra)

Computer Engineering Department

Surprise Test

Class: T. Y. B. Tech.

Sem: EVEN

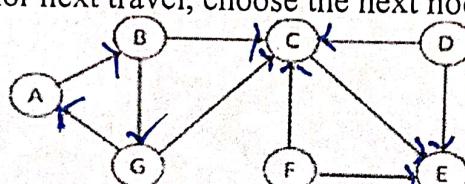
Subject: CO353U Design and Analysis of Algorithms

Duration: 1Hr

Marks: 16

1.

| Que. No. | Question | Max. Marks |
|----------|--|------------|
| 1 | Explain Depth First Traversal Method for Graph with algorithm with example. | 4 |
| 2 | Write a short note on graph traversals. Perform BFS traversal on the following graph starting from node A. If multiple node choices may be available for next travel, choose the next node in alphabetical order. | 4 |
| 3 | Define P, NP, NP-Hard and NP-Complete Problem with an example. | 4 |
| 4 | State whether Hamiltonian problem is a NP-Complete problem? Justify your answer. | 4 |



Government College of Engineering, Jalgaon

(An Autonomous Institute of Govt. of Maharashtra)

Computer Department
RE-MSE Question Paper

Class: T. Y. B. Tech.

Sem: Odd

Subject: CO 351U Software Project Management

Date: 12/04/2023

Duration: 2Hrs

Marks: 30

NOTE: 1. Bloom's Taxonomy level is defined as per Revised 2001 model

2. All Questions are as per course Outcomes

3. Assume suitable data wherever is required.

Course Outcomes:

- able to practice project development principles while developing software.
- able to understand project management in terms of the software development process.
- able to do strategic project planning.
- able to perform project quality management using tools and techniques for quality control.

| Que. No. | Question | Max. Marks | CO Mapped | Blooms Taxonomy Level |
|----------|--|------------|-----------|-----------------------|
| 1 | Attempt any two: | | | |
| a | Explain the Project Success factors. | 3 | CO 3 | Understand |
| b | Explain the three sphere model for systems management | 3 | CO 2 | Understand |
| c | Explain the role of Project manager. | 3 | CO 3 | Remember |
| 2 | Attempt any one: | | | |
| a | What is Project? State and explain how triple constraints affect the project. | 6 | CO 3 | Application |
| b | State and explain the Project Attributes. | 6 | CO 1 | Remember |
| 3 | Attempt all | | | |
| a | Explain the tools and techniques used in Integration, Time, Cost and quality management knowledge areas. | 6 | CO 3 | Application |
| b | State and Explain the four frames of organization. | 6 | CO 3 | Understand |
| c | Explain typical organizational structure of software organization. | 6 | CO 2 | Understand |

100/100


GOVERNMENT COLLEGE OF ENGINEERING, JALGAON
(An Autonomous Institute of Government of Maharashtra)

National Highway No.6, JALGAON - 425 002



Name of Examination : Summer 2024

Course Code & Course Name : CO354UB - Internet Of Things

Maximum Marks : 60

Duration : 3 Hrs

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks followed by corresponding Course Outcomes (CO) and revised Bloom's Taxonomy level (L1 to L6).

1) Attempt any two

- a) Explain IoT technology with its important characteristics. Discuss the Impact of IoT on various sectors, such as healthcare, transportation, or environmental monitoring. [6][CO1][L2]
- b) Describe the role of the link layer in IoT architecture. Explain the protocols commonly used at this layer? [6][CO1][L2]
- c) Differentiate between M2M and IoT technologies. Discuss how M2M communication lays the groundwork for many IoT applications. [6][CO1][L2]

2) Attempt any two

- a) Discuss the challenges organizations face while designing and deploying IoT solutions in diverse environments. How can these challenges be addressed? [6][CO1][L2]
- b) Explain various IoT Communication Models with a neat diagram. Also state the use of each model. [6][CO1][L2]
- c) Compare and contrast REST and Websockets communication APIs in IoT. [6][CO1][L2]

3) Attempt any two

- a) Explain the concept of clustering in the context of IoT networks and sensor devices. Discuss various functions of Cluster Head (CH). How does clustering contributes to the resource management in IoT? [6][CO2][L2]
- b) Discuss the importance of data synchronisation in IoT. Explain various methods of data synchronisation. What are various tools used for data synchronisation? [6][CO2][L2]
- c) Explain SDN with its architecture. Identify the benefits of implementing SDN, also the challenges facing with the adoption of SDN technology. Provide examples of use cases where SDN technology has been successfully deployed. [6][CO2][L2]

4) Attempt All

- a) Explain the following protocols in detail with their applications:
i) MQTT ii) RFID [6][CO3][L2]
- b) Explain various Routing protocols with their specific use. [6][CO3][L2]

5) Attempt All

- a) Discuss various IoT business models giving application of each model. [6][CO4][L2]
- b) Discuss the role of Python in IoT. Explain various IoT tools which are popular in the development of IoT applications. [6][CO4][L2]

All the best!