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B.Tech (CSE/IT)
II YEAR, IV SEMESTER EXAMINATION
ORGANISATIONAL BEHAVIOUR

[Time : 03:00 Hours]

[Max. Marks : 70]

NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS.**QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.**

(4*3=12)

- a) Write short notes on.
 Organizing
 Staffing
- b) Define Management .Write the nature and Importance of Management.
- c) What is planning? Explain the steps and techniques of Planning.
- d) Write the Contribution of Henry Fayol's in Management.
- e) What are the various Principles of Management?

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3*4=12)

- a) Define autocratic and charismatic leadership.
- b) Write short note on-
 Unity of Direction
 Unity of Command
 Authority and Responsibility
 Centralization
- c) What is controlling? define the importance of controlling.
- d) Explain the fundamental aspects of OB.

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3*6=18)

- a) Explain the different types of Personality.
- b) According to P. F. Drucker – “What-ever a manager does he does through decision making. Define this statement with the importance of Decision Making.
- c) Write short notes on-
 Programmed and Non-Programmed Decisions:
 Individual and Group Decisions:
- d) Define Leadership, Critically evaluate the various theories of leadership with their pros & Cons in the present content.

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7=14)

- a) Describe Johari's window modal.
- b) What do you understand by Motivation? Can you motivate people in your organization? If so, How? Explain in detail with the help of the theories of Motivation.
- c) Explain Maslow's theory of motivation.

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7=14)

- a) What is Leadership? Outline the qualities of a good leader.
- b) Differentiate between Transactional and Transformational leadership.
- c) Define Life Positions.

Enrollment No.

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B.Tech (CSE/IT)
II YEAR, IV SEMESTER EXAMINATION
COMPUTER ORGANISATION AND ARCHITECTURE

[Time : 03:00 Hours]

[Max. Marks : 70]

NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS.**QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.****(4*3=12)**

- a) Explain floating point representation of an integer?
- b) What is Stack? Explain the working of PUSH and POP operations?
- c) What is Input Output Subsystem?
- d) What is programmed initiated input output?
- e) What is interrupt initiated input output?
- f) How data hazard can be prevented in pipelining?

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.**(3*4=12)**

- a) Explain memory hierarchy with description of semiconductor memory?
- b) What are the differences between hardwired and microprogrammed control unit?
- c) Explain the working and action of DMA with the help of a suitable example.
- d) Explain types of register in computer organization and architecture

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.**(3*6=18)**

- a) Explain optimal page replacement algorithm with example?
- b) Write a note on the working of Micro programmed control unit design.
- c) What is the difference between implied and immediate addressing modes? Explain with an example.
- d) Give the main physical differences between the following memory technologies: SRAMs, flash memories and CD-ROM.?

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.**(2*7=14)**

- a) Using BOOTHs algorithm multiply 23(Multiplicand) by 29(Multiplier), each no .is represented by 6 bit?
- b) The following page reference changes occur during a given time interval.

4 2 0 1 2 6 1 4 0 1 0 2 3 5 7

Determine the four pages that are resident in main memory after each page reference change if the replacement algorithm used is (a) FIFO (b) LRU

- c) Draw the neat sketch of memory hierarchy and explain the need of cache memory

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.**(2*7=14)**

- a) Explain about the Various pipeline performance measures.
- b) Discuss the conceptual organization of a multilevel memory system used in computers.
- c) Explain the various types of cache organization. Differentiate among all mapping

Printing Pages : 2

Paper Code : - KAS-403

(C) (SVSU) : 2024-2025/R

Enrollment No.

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B.TECH (CSE/FT)
II YEAR IV SEMESTER EXAMINATION
ENGINEERING MATHEMATICS – III

[Time : 3:00 Hours]

[Max. Marks : 70]

NOTE: - ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS. NON – PROGRAMMABLE SCIENTIFIC CALCULATORS ARE ALLOWED.

1. Attempt any four parts of the following:

(4 X 3 = 12m)

(a) Solve $\sqrt{p} + \sqrt{q} = 1$

(b) Solve $(D^2 - D'^2 + D - D')z = 0$

(c) A die is tossed thrice A success is getting 1 or 6 on a toss. Find the mean and variance of the number of success.

(d) If the regression coefficients are 0.8 and 0.2, what would be the coefficient of correlation?

(e) Find the cubic polynomial which takes the following values:

x	0	1	2	3
F(x)	1	2	1	10

(f) Show that- $E = 1 + \Delta$ and $\frac{\Delta}{\nabla} - \frac{\nabla}{\Delta} = \nabla + \Delta$.

2. Attempt any three parts of the following:

(3 X 4 = 12m)

(a) Form the partial differential equation by eliminating the function f from the relation $z = ax + by + ab$ (b) Find the value of $\Delta^2 \cos 2x$.

(c) Find the missing values in the table:

x	45	50	55	60	65
y	3	—	2	—	-2.4

(d) Using Newton's divided difference interpolation formula, find the values of $f(8)$ from the following table:

x	4	5	7	10	11	13
F(x)	48	100	294	900	1210	2028

[P.T.O.]

Printing Pages : 1

Paper Code : - KAS-404

(C) (SVSU) : 2024-2025/R

Enrollment No.

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**B.TECH (CS/AEROSPACE/FT)
II YEAR IV SEMESTER EXAMINATION
ENVIRONMENTAL SCIENCES**

[Time : 3:00 Hours]

[Max. Marks : 70]

NOTE: - ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS.**QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.****(4*3=12)**

- What is the need for public awareness in environmental protection?
- Describe the structure in ecosystem?
- Mention any two water management practices.
- Discuss advantages and disadvantages of dam construction?
- State the principles and objective of environmental sciences.
- Explain the control measures of solid waste.

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.**(3*4=12)**

- Explain values of biodiversity in detail.
- Describe the control strategy of Air pollution.
- Short notes on
Noise pollution
Hot spots
- What are the sources, effect and control of water pollution?

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.**(3*6=18)**

- Define and Explain the multidisciplinary nature of Environmental studies?
- What do you understand by carbon foot prints? How can we contribute to reduce them?
- Discuss the global warming in detail.
- Explain the Energy flow with the help of food chain food web and ecological pyramids.

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.**(2*7=14)**

- Define atmosphere? Discuss the various layers of atmosphere?
- Define the ecosystem? Also describe the structure of forest ecosystem in detail?
- Define types of biological diversity? Describe the conservation measures of biological diversity in details?

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.**(2*7=14)**

- Define different types air pollutants? Discuss the cause, effects and control measures of Air pollution in detail?
- What do you understand by carbon foot prints? How can we contribute to reduce them?
- Discuss the Bhopal Gas Tragedy in Detail.

Printing Pages : 1

Paper Code : - BMC -403

(B) (SVSU) : 2023-2024/R

Enrollment No.

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B.Tech (CSE/IT)

**II YEAR, IV SEMESTER EXAMINATION
ENVIRONMENTAL SCIENCES**

[Time : 03:00 Hours]

[Max. Marks : 70]

NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS.

QUESTION NO. 1: ATTEMPT ANY FOUR PARTS**(4*3=12)**

- A) Describe the sustainable development.
- B) Biodiversity at national and global level.
- C) Define Values of biodiversity in detail.
- D) Define the pond ecosystem?
- E) Define the term mining and dereliction.
- F) Explain Noise pollution and their control measure.

QUESTION NO. 2: ATTEMPT ANY THREE PARTS.**(3*4=12)**

- A) Describe the energy flow in ecosystem?
- B) Discuss the global warming green house effect in detail
- C) Describe India as a mega diverse nation explains.
- D) Define forest resource and their values?
- E) Explain the power and guidelines of NGT.

QUESTION NO. 3: ATTEMPT ANY THREE PARTS.**(3*6=18)**

- A) Describe the role and power of NGT.
- B) Define the Tehri Dam conflict and Silent valley movement in details?
- C) Discuss the EIA process in detail.
- D) Describe the effects& control of water pollution on human being.
- E) Discuss the remedial measures to control the air pollution.

QUESTION NO. 4: ATTEMPT ANY TWO PARTS.**(2*7=14)**

- A) Define the term ecological pyramid? Describe different type of ecological pyramid with examples?
- B) Define and Explain the multidisciplinary nature of Environmental studies?
- C) What do you understand by carbon foot prints? How can we contribute to reduce them?

QUESTION NO. 5: ATTEMPT ANY TWO PARTS.**(2*7=14)**

- A) Define the importance of environmental education. How public awareness can help in conservation of environment?
- B) Define solid waste and its types. What are the causes of solid waste generation? Explain different techniques used in solid waste management.
- C) Define atmosphere? Discuss the various layers of atmosphere?

[illegible]

II YEAR, IV SEMESTER EXAMINATION
DESIGN AND ANALYSIS OF ALGORITHMS

[Max. Marks : 70]

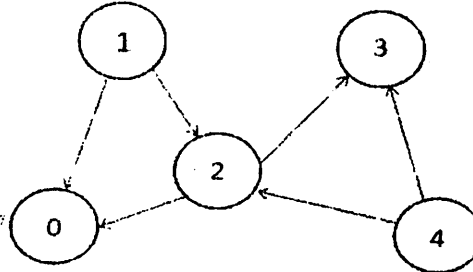
NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS. [Max

(4*3=12)

- Difference between Greedy Technique and Dynamic programming.
- Solve the following recurrence using Master method: $T(n) = 4T(n/2) + n^2$
- Name the sorting algorithm that is most practically used and also write its Time Complexity
- Find the time complexity of the recurrence relation $T(n) = n + T(n/10) + T(7n/5)$
- Explain principle of optimality.

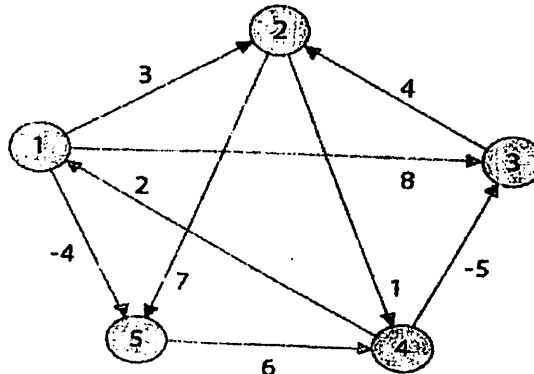
(3*4=12)

- What is backtracking? Discuss sum of subset problem with the help of an example.
- Explain the role of Big OH in analysis of algorithms with example.
- Design the Huffman code for the frequencies
a: 45, b:13, c:12, d:16, e:5, f:5
- Find transitive closure of the given graph



(3*6=18)

- a) Find the shortest path between all pair of the graph



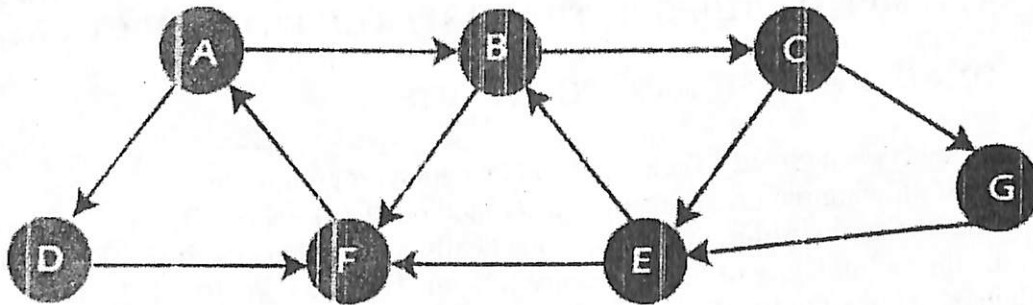
- Compute the prefix function π for the pattern ababbabbabbababbabb when the alphabet is $\Sigma = \{a, b\}$. Explain also KMP algorithm.
- Explain randomized algorithm with an example.
- What is N-queen problem? Draw a state space tree for 4-queen problem using backtracking.

[P.T.O.]

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7=14)

- Consider four items along with their weight (W) and profit (P)
 No. of items = $n = 4$
 $W = \langle 2, 3, 4, 5 \rangle$
 $P = \langle 1, 2, 5, 6 \rangle$
 Fill the knapsack using 0/1 knapsack.
- Explain the BFS for the given graph.

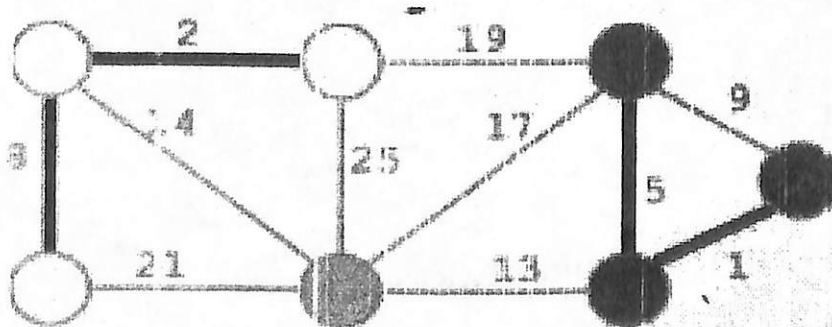


- Find the longest common subsequences for the string
 $X = \langle A, B, C, B, D, A, B \rangle$
 $Y = \langle B, D, C, A, B, A \rangle$

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7=14)

- Discuss the problem classes P, NP, NP-hard and NP-complete.
- What is spanning tree? Find the minimum spanning tree for the given graph



- Find the optimal parenthesization of matrix-chain product whose dimension is $\langle 30, 35, 15, 5, 10, 20, 25 \rangle$

Printing Pages : 1

Paper Code :- KCSE-402

(C) (SVSU) : 2024-2025/R

Enrollment No.

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B.TECH (CSE/IT)

II YEAR IV SEMESTER EXAMINATION

THEORY OF AUTOMATA AND FORMAL LANGUAGES

[Time : 3:00 Hours]

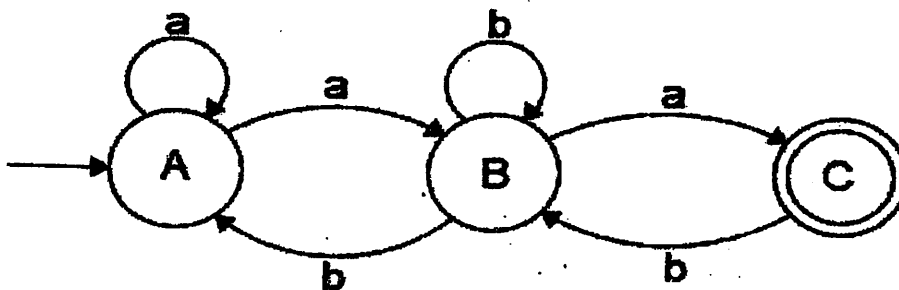
[Max. Marks : 70]

NOTE: - ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS

I. Answer Any Three. All Question carry equal marks.

[10×3=30]

1. Consider the transition system given below. Solve the automata

2. Design a PDA for the following Language $L = \{a^n b^m c^n, m, n > 0\}$.3. Given $\Sigma = \{a, b\}$, construct a DFA that shall recognize the language $L = \{b^m a b^n : m, n > 0\}$ 4. Define Turing Machine. Construct a Turing Machine for $L = \{a^n b^n, n > 0\}$.

II Answer Any Four. All Question carry equal marks.

[6×4=24]

5. Design a DFA with sigma $\Sigma = \{0, 1\}$ for the language accepting strings starting and ending with different characters.6. Obtain the NPDA from CFG, $S \rightarrow 0BB, B \rightarrow 0S, B \rightarrow 1S, B \rightarrow 0$.7. Determine a CFG without λ -production equivalent to the grammar given by P as $S \rightarrow ABaC, A \rightarrow BC, B \rightarrow b/\lambda, C \rightarrow D/\lambda, D \rightarrow d$ 8. Define ambiguity. Show that the grammar G with following production is ambiguous. $S \rightarrow a | aAb | abSb, A \rightarrow aAAb | bS$.

9. Construct an NFA that accepts the "abac" over input a,b,c.

III Answer Any Four. All Question carry equal marks.

[4×4=16]

10. Construct the CFG for the language $L = \{a^m b^n, m > n \text{ and } m, n \geq 0\}$

11. Convert the CFG which is given below into CNF

 $S \rightarrow abSb/a/aAb$ $A \rightarrow bS/aAAb$ 12. Let G be the grammar $S \rightarrow 0B|1A, A \rightarrow 0|0S|1AA, B \rightarrow 1|1S|0BB$

For the string 00110101, find:

(i) The leftmost derivation. (ii) The rightmost derivation. (iii) The derivation tree.

13. Differentiate between Mealy and Moore Machine.

14. Design a DFA for languages L containing strings of 0 and 1's where number of 1's is divisible by 2.

ENROLLMENT NO.

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B.TECH. (CS/IT)

II Year IV SEMESTER EXAMINATION

DESIGN AND ANALYSIS OF ALGORITHMS

[Time:- 3 Hrs]

[Max. Marks:-70]

NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS.

QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.

(4*3=12)

- How analyze the performance of an algorithm in different cases?
- Explain NP-complete and NP-Hard.
- Define principle of optimality.
- Distinguish between deterministic and non-deterministic algorithm.
- What is minimum spanning tree? What are its advantages?

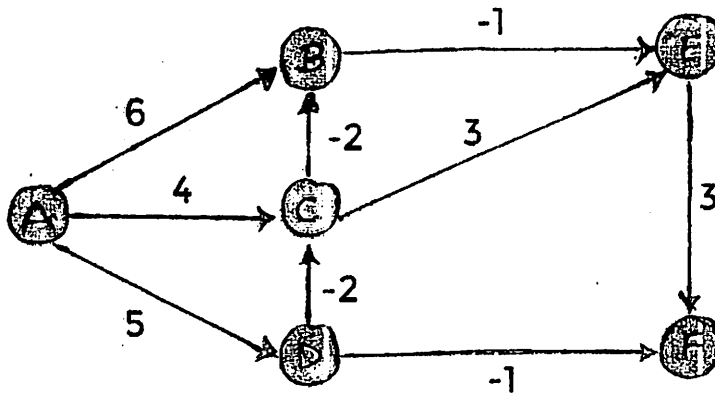
QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3*4=12)

- Solve the recurrence equation

$$T(n) = 3T(n^{1/3}) + \log_3 n$$

- Find the single pair shortest path using Bellman ford Algorithm



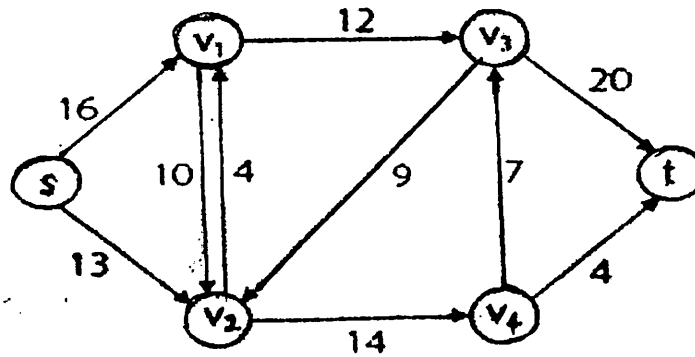
- Illustrate n queen's problem. Examine 4 queen's problem using back tracking method.
- Why do we perform topological sorts only on DAGs? Explain.

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3*6=18)

- What is the sum of subsets problem? Let $w = \{5, 7, 10, 12, 15, 18, 20\}$ and $m = 35$. Find all possible subsets of w that sum to m using recursive backtracking algorithm for it. Draw the portion of the state-space tree that is generated.
- Describe asymptotic notation.
- Write a short note on approximation algorithms.
- Find the maximum flow through the given network using Ford-Fulkerson method.

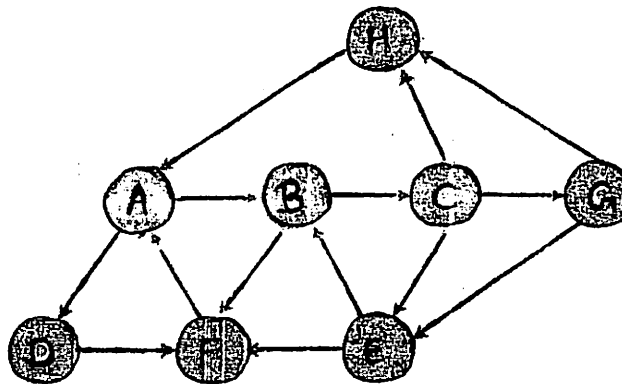
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QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7=14)

a) Explain the DFS for the given graph, Start from A.



b) What are greedy algorithms? What are their characteristics? Explain any greedy algorithm with example.

c) Solve the recurrence

- i) $T(n) = 3T(n/4) + cn^2$ using recursion tree method.
- ii) $T(n) = n + 2T(n/2)$ using Iteration method. (Given $T(1)=1$)

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7=14)

- a) Write Rabin Karp string matching algorithm. Working modulo $q=11$, how many spurious hits does the Rabin karp matcher in the text $T = 3141592653589793$, when looking for the pattern $P=26$.
- b) What is Knapsack problem? Solve Fractional knapsack problem using greedy programming for the following four items with their weights $w = \{3, 5, 9, 5\}$ and values $P = \{45, 30, 45, 10\}$ with knapsack capacity is 16.
- c) Find the optimal parenthesization of matrix-chain product whose dimension is $\langle 30, 35, 15, 5, 10, 20, 25 \rangle$

Printing Pages : 1

Paper Code :- KCSE-402

(B) (SVSU) : 2024-2025/R

Enrollment No.

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B.TECH (CSE/IT)
II YEAR IV SEMESTER EXAMINATION
THEORY OF AUTOMATA AND FORMAL LANGUAGES

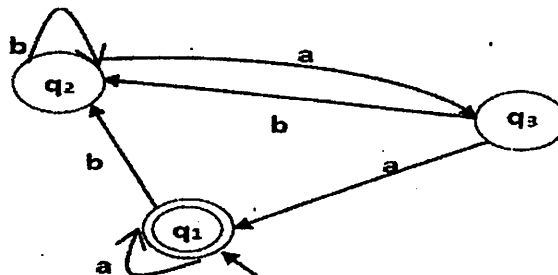
[Time : 3:00 Hours]

[Max. Marks : 70]

NOTE: - ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS**I Answer Any Three. All Question carry equal marks.**

[10×3=30]

1. Explain Arden's Theorem and construct a regular expression corresponding to the automata given below -



2. Design a PDA for the following Language $L = \{a^n b^n, n > 0\}$ by empty store.
 3. Define Turing Machine. Construct a Turing Machine for $L = \{a^n b^n, n > 0\}$.
 4. Given $\Sigma = \{a, b\}$, construct a DFA which recognize the language $L = \{a^m b^n : m, n > 0\}$
- II Answer Any Four. All Question carry equal marks.** [6×4=24]
5. Construct a NDFA that accepts the strings over $\{0,1\}$ that have at least two consecutive 0's and 1's.
 6. Write short note on Halting problem.
 7. Write regular expression for a language containing strings of 0's and 1's which does not end in '01'
 8. Define ambiguity. Show that the grammar G with following production is ambiguous.
 $S \rightarrow a \mid aAb \mid abSb, A \rightarrow aAa \mid bS.$
 9. Design a DFA for languages L containing strings of 0 and 1's where number of 0's is not divisible by 3.
- III Answer Any Four. All Question carry equal marks.** [4×4=16]
10. Let G be the grammar $S \rightarrow 0B \mid 1A, A \rightarrow 0S \mid 1AA, B \rightarrow 1 \mid 1S \mid 0BB$
 For the string 00110101, find:
 (i) The leftmost derivation. (ii) The rightmost derivation. (iii) The derivation tree.
 11. Convert the CFG which is given below into CNF
 $S \rightarrow bA/aB$
 $A \rightarrow bAA/aS/a$
 $B \rightarrow aBB/bS/b$
 12. Convert the Moore Machine to Mealy Machine.

Present state	Next State		Output
	Input = 0	Input = 1	
Q ₀	Q ₃	Q ₁	0
Q ₁	Q ₁	Q ₂	1
Q ₂	Q ₂	Q ₃	0
Q ₃	Q ₃	Q ₀	0

13. Obtain the NPDA from CFG
 $S \rightarrow a, S \rightarrow aAB, A \rightarrow aA, A \rightarrow a, B \rightarrow bB, B \rightarrow b$
 14. Construct a DFA that accepts the strings which end with 00 over alphabets $\Sigma = \{0, 1\}$?

ENROLLMENT NO.

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B.TECH. (CS/IT)

II Year IV SEMESTER EXAMINATION

DESIGN AND ANALYSIS OF ALGORITHMS

[Time:- 3 Hrs]

[Max. Marks:-70]

NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS.

QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.

(4*3=12)

- How analyze the performance of an algorithm in different cases?
- Explain NP-complete and NP-Hard.
- Define principle of optimality.
- Distinguish between deterministic and non-deterministic algorithm.
- What is minimum spanning tree? What are its advantages?

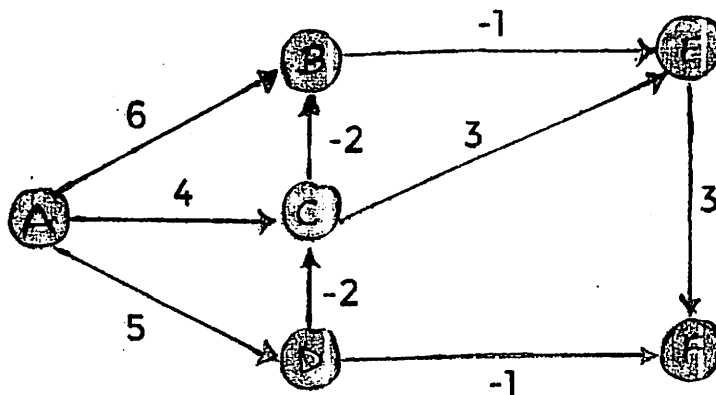
QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3*4=12)

- Solve the recurrence equation

$$T(n) = 3T(n^{1/3}) + \log_3 n$$

- Find the single pair shortest path using Bellman ford Algorithm



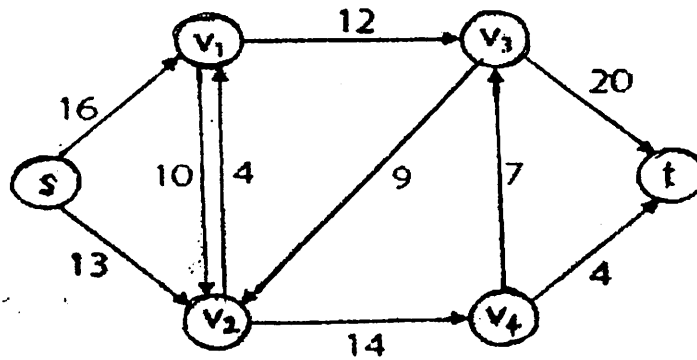
- Illustrate n queen's problem. Examine 4 queen's problem using back tracking method.
- Why do we perform topological sorts only on DAGs? Explain.

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3*6=18)

- What is the sum of subsets problem? Let $w = \{5, 7, 10, 12, 15, 18, 20\}$ and $m = 35$. Find all possible subsets of w that sum to m using recursive backtracking algorithm for it. Draw the portion of the state-space tree that is generated.
- Describe asymptotic notation.
- Write a short note on approximation algorithms.
- Find the maximum flow through the given network using Ford-Fulkerson method.

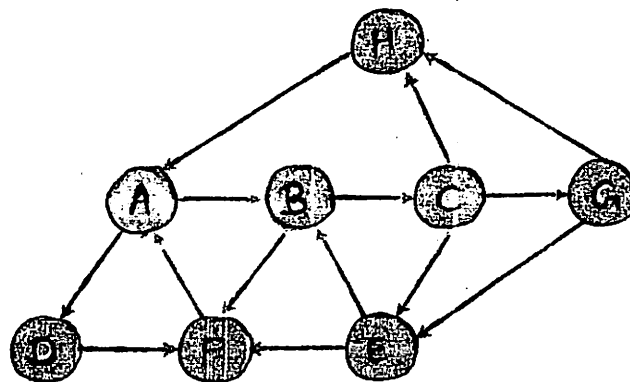
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QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7=14)

a) Explain the DFS for the given graph, Start from A.



b) What are greedy algorithms? What are their characteristics? Explain any greedy algorithm with example.

c) Solve the recurrence

- i) $T(n) = 3T(n/4) + cn^2$ using recursion tree method.
- ii) $T(n) = n + 2T(n/2)$ using Iteration method. (Given $T(1)=1$)

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7=14)

- a) Write Rabin Karp string matching algorithm. Working modulo $q=11$, how many spurious hits does the Rabin karp matcher in the text $T=3141592653589793$, when looking for the pattern $P=26$.
- b) What is Knapsack problem? Solve Fractional knapsack problem using greedy programming for the following four items with their weights $w = \{3, 5, 9, 5\}$ and values $P = \{45, 30, 45, 10\}$ with knapsack capacity is 16.
- c) Find the optimal parenthesization of matrix-chain product whose dimension is $\langle 30, 35, 15, 5, 10, 20, 25 \rangle$

Printing Pages : 1

Paper Code :- KCSE-402

(B) (SVSU) : 2024-2025/R

Enrollment No.

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B.TECH (CSE/IT)

II YEAR IV SEMESTER EXAMINATION

THEORY OF AUTOMATA AND FORMAL LANGUAGES

[Time : 3:00 Hours]

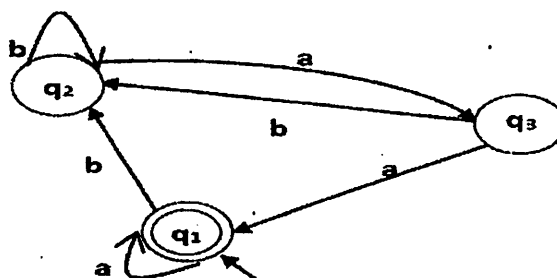
[Max. Marks : 70]

NOTE: - ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS

I Answer Any Three. All Question carry equal marks.

[10×3=30]

1. Explain Arden's Theorem and construct a regular expression corresponding to the automata given below –



2. Design a PDA for the following Language $L = \{a^n b^n, n > 0\}$ by empty store.
 3. Define Turing Machine. Construct a Turing Machine for $L = \{a^n b^n, n > 0\}$.
 4. Given $\Sigma = \{a, b\}$, construct a DFA which recognize the language $L = \{a^m b^n : m, n > 0\}$
- II Answer Any Four. All Question carry equal marks. [6×4=24]
5. Construct a NDFA that accepts the strings over $\{0,1\}$ that have at least two consecutive 0's and 1's.
 6. Write short note on Halting problem.
 7. Write regular expression for a language containing strings of 0's and 1's which does not end in '01'
 8. Define ambiguity. Show that the grammar G with following production is ambiguous.
 $S \rightarrow a \mid aAb \mid abSb, A \rightarrow aAAb \mid bS$.
 9. Design a DFA for languages L containing strings of 0 and 1's where number of 0's is not divisible by 3.
- III Answer Any Four. All Question carry equal marks. [4×4=16]
10. Let G be the grammar $S \rightarrow 0B \mid 1A, A \rightarrow 0 \mid 0S \mid 1AA, B \rightarrow 1 \mid 1S \mid 0BB$
 For the string 00110101, find:
 (i) The leftmost derivation. (ii) The rightmost derivation. (iii) The derivation tree.
 11. Convert the CFG which is given below into CNF
 $S \rightarrow bA/aB$
 $A \rightarrow bAA/aS/a$
 $B \rightarrow aBB/bS/b$
 12. Convert the Moore Machine to Mealy Machine.

Present state	Next State		Output
	Input = 0	Input = 1	
Q ₀	Q ₃	Q ₁	0
Q ₁	Q ₁	Q ₂	1
Q ₂	Q ₂	Q ₃	0
Q ₃	Q ₃	Q ₀	0

13. Obtain the NPDA from CFG
 $S \rightarrow a, S \rightarrow aAB, A \rightarrow aA, A \rightarrow a, B \rightarrow bB, B \rightarrow b$
 14. Construct a DFA that accepts the strings which end with 00 over alphabets $\Sigma = \{0, 1\}$?

Printing Pages : 1

Paper Code : - KCSE-401

(C) (SVSU) : 2024-2025/R

Enrollment No.

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B.TECH (CSE/IT)
II YEAR IV SEMESTER EXAMINATION
OPERATING SYSTEMS

[Time : 3:00 Hours]

[Max. Marks : 70]

NOTE: - ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS**QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.**

(4*3=12)

- Define Operating System? Discuss the generations of OS?
- Explain the types of operating system in brief.
- What do you mean by Process Control Block (PCB)? What are its contents? Discuss.
- What are Semaphores? Explain two primitive semaphore operations.
- Explain the differences between Process and Thread.
- Differentiate between Starvation and Deadlock.

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3*4=12)

- Discuss Monolithic structure of the OS with a neat diagram.
- Define Throughput, Turnaround time, Waiting time and Response time.
- Describe the necessary conditions for a deadlock situation to arise.
- What is the concept of Memory Management? Why memory management is required?

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3*6=18)

- Define External fragmentation. What are the causes for external fragmentation?
- State Sleeping Barber problem and write relevant statements to solve Sleeping Barber problem using semaphores.
- Write a note on Deadlock detection and recovery.
- Describe the First-fit, Best-fit and Worst-fit strategies in reference to memory management.

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7=14)

- Explain in detail the implementation of Paging.
- Discuss the Shortest Job First (SJF) scheduling algorithm. Find the average turnaround time and average waiting time for the processes given in the table below:

Process	Arrival time	CPU burst time
P1	1	7
P2	3	3
P3	6	2
P4	7	10
P5	9	8

- Define Virtual Memory. Why we need virtual memory? Describe the working mechanism of virtual memory.

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7=14)

- Discuss the mechanism of Demand Paging with a neat sketch. Write advantages and disadvantages.
- What are Co-operating processes? Describe the mechanism of interprocess communication using shared memory in a Producer-Consumer problem.
- What is page replacement? Discuss page replacement algorithm with suitable examples.

Printing Pages : 1

Paper Code : - BCSE -403

(A) (SVSU) : 2023-2024/R

Enrollment No.

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B.Tech (CSE/IT)
II YEAR, IV SEMESTER EXAMINATION
OPERATING SYSTEMS

[Time : 03:00 Hours]

[Max. Marks : 70]

NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS.**QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.**

(4*3=12)

- What is Operating System? What are the functions of operating system?
- Write the concept of Race condition.
- What is a Process? Draw and explain process state diagram.
- Explain the terms Critical Section and Mutual Exclusion.
- What do you understand by Independent process and Cooperating processes? Explain.
- Differentiate between Starvation and Deadlock.

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3*4=12)

- With a neat sketch discuss the Layered structure of the Operating System.
- What is CPU scheduling? Briefly discuss the long term, medium term and short term scheduler.
- Describe the necessary conditions for a deadlock situation to arise.
- What is the concept of Memory Management? Why memory management is required?

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3*6=18)

- What do Page Fault occurs? Describe the action taken by the OS when page fault occurs.
- State Producer-Consumer problem and write relevant statements to solve consumer/producer problem using semaphores.
- Write a note on Unix Operating System.
- State and discuss the concept of Compaction in the memory management.

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7=14)

- Explain the techniques of Deadlock Prevention.
- Discuss the Round Robin scheduling algorithm. Find the average turnaround time and average waiting time for the processes given in the table below:

Process	Arrival time	CPU burst time
P1	0	5
P2	1	6
P3	2	3
P4	3	1
P5	4	5
P6	6	4

- Compare and contrast the Long term, Short term and Medium term schedulers.

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7=14)

- Discuss the mechanism of Demand Paging with a neat sketch. Write advantages and disadvantages.
- Distinguish between Distributed operating system and Network operating system. Write their advantages and disadvantages with suitable diagram if needed.
- Write and explain the Banker's algorithm for avoidance of deadlock with a suitable example. Give all the necessary steps.

[illegible]

[Max. Marks : 70]

NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS

(4*3=12)

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3*4=12)

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3*6=18)

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7=14)

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7=14)

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.	
a)	Write a JAVA program to create a class with following class members: Data member: Empno, Name, Basic, HRA, DA, NP(NetPay) Member method/Function for 1. Inputting data 2. Calculation of HRA is 10% of Basic-Pay, DA is 50% of basic Pay and Netpay=Basic+HRA+DA 3. Displaying of output of data in appropriate format.
b)	Explain the applet life cycle in Java by explaining the roles of methods such as init(), start(), stop(), destroy(), and paint() with appropriate use cases.
c)	Write and implement a Java Swing-based GUI application that allows users to input two numeric values via text fields, computes their sum on button click, and displays the result in a label.
