

ANDHRA UNIVERSSSITY
SCHOOL OF DISTANCE EDUCATION
ASSIGNMENT QUESTION PAPER
MCA (Second Year)
THEORY OF COMPUTATION

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. Briefly explain about Universal Turing machine.
2. For each of the following RE draw NFA with ϵ – transitions:
 - i) $(0+1)(01)^*(011)^*$
 - ii) $(0 + 1)^* (00+1) (0 + 1)^*$
3. Construct DFA for the language.
4. Eliminate Null productions form the following CFG:
$$S \rightarrow ABA, \quad A \rightarrow aA \mid \epsilon, \quad B \rightarrow bB \mid \epsilon$$
5. Consider the grammar $S \rightarrow (L) \mid a, L \rightarrow L, S \mid S$. Derive expression $((a, a), (a, a))$ by leftmost derivation and rightmost derivation.

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ASSIGNMENT QUESTION PAPER
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THEORY OF COMPUTATION

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. State the Halting problem.
2. Write about Universal Turning Machine
3. Construct NPDA for the language.
4. Construct GNF grammar for the following CFG:
 $S \rightarrow AA \mid b, A \rightarrow SS \mid a$
5. Give the NFA's, which accepting the following languages over the alphabets $\{0, 1\}$
 - i) Set of all strings with three consecutive 0's.
 - ii) Set of all strings such that 5th symbol from right end is 1.

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ASSIGNMENT QUESTION PAPER
MCA (Second Year)
COMPUTER GRAPHICS

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. What are the applications and usage of computer graphics? Discuss.
2. What is meant by normalized device co-ordinate system? Write its advantages.
3. What are the advantages of mini max in Z- buffer algorithm?
4. Describe Bezier Surface generation technique with examples.
5. Explain the terms frame buffer and aliasing. Discuss about any two anti aliasing methods.

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ASSIGNMENT QUESTION PAPER
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COMPUTER GRAPHICS

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. Explain the feature of Bresenham's line drawing algorithm.
2. Discuss the role of display interpreter in graphical display, with a block diagram.
3. What is meant by composite transformation? Explain.
4. Distinguish between window and view port.
5. Outline the t-buffer algorithm. List advantages and disadvantages.

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ASSIGNMENT QUESTION PAPER
MCA (Second Year)
FILE STRUCTURES

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. Explain different types of storage and their storage hierarchy.
2. Write and explain the procedure involved in transmitting a byte from data area to file.
3. What are the various methods of organising the records on a file? Explain.
4. What is inverted list? Explain the conceptual view of the primary key reference fields as a series of lists.
5. Compare the strength and weaknesses of R+ trees and B – trees.

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FILE STRUCTURES

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. How to link a logical file within program to physical file? Explain.
2. Discuss what happen when a program writers a byte to file on a disk.
3. How can we search a record faster than sequential search? Discuss.
4. What are the three possible situations of record updating? Discuss.
5. List the B- tree properties. Explain search and insert method with respect to B – tree.

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ASSIGNMENT QUESTION PAPER
MCA (Second Year)
DESIGN AND ANALYSIS OF ALGORITHMS

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. What are the different mathematical notations used for algorithm analysis?
2. Define and described any three asymptotic notations.
3. Write the general method of divide and conquer approach and explain.
4. Explain Dijkstra's algorithm with example.
5. Explain Hamiltonian circuit problem with an example.

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ASSIGNMENT QUESTION PAPER
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DESIGN AND ANALYSIS OF ALGORITHMS

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. Compare time complexity with space complexity. Give suitable example.
2. Give the big – O notation definition and discuss with suitable example.
3. Write divide and conquer recursive merge sort algorithm and derive the time complexity of this algorithm.
4. Write any one none-deterministic algorithm and explain.
5. Define back backing and list the applications of back tracking.

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ASSIGNMENT QUESTION PAPER
MCA (Second Year)
Operating systems

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. What are the functions and services of operating system? Discuss.
2. Discuss various criteria used for short-term scheduling.
3. How deadlock problem can be prevented? Suggest suitable solutions.
4. Discuss about various mechanisms provided for inter process communication and synchronisation in detail.
5. What is the difference between simple paging and virtual memory paging? Why the principle of locality is crucial to the use of virtual memory?

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Operating systems

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. DMA access to main memory is given higher priority than processor access to main memory. Explain with example.
2. What are pre-emptive and non- pre-emptive scheduling policies? Give examples.
3. What is accomplished in page buffering? Discuss how thrashing can be detected by OS? What can be done to alleviate this problem?
4. What are the various access rights that can be assigned to a particular user for a particular file?
5. What are the various types of operations that may be performed on the directory?

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ASSIGNMENT QUESTION PAPER
MCA (Second Year)
DATA COMMUNICATION AND NETWORKS

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. What are the three criteria necessary for an effective and efficient network?
2. Name services provided by the application layer in the internet model.
3. Explain line coding schemes.
4. Explain about error detection codes with an example.
5. Explain about virtual LANs.

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ASSIGNMENT QUESTION PAPER
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DATA COMMUNICATION AND NETWORKS

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. Explain about half-duplex and full-duplex transmission modes.
2. Explain about the responsibilities of the data link layer in the internet model.
3. Explain about modulation of analog signals.
4. Explain about IPV6 protocol.
5. Explain about client server model in detail.

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ASSIGNMENT QUESTION PAPER
MCA (Second Year)
DATABASE MANAGEMENT SYSTEMS

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. With a neat diagram, explain different levels of abstraction in a DBMS. Explain how it supports data independence.
2. How does the Tuple relational calculus differ from domain relational calculus? Explain.
3. How does SQL implement the entity integrity and referential integrity constraints of the relational data model?
4. What is UDBC? How is it related to SQL/CLI?
5. What are the properties of transactions? Explain.

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DATABASE MANAGEMENT SYSTEMS

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. Explain about UML class diagram.
2. What is TDBC? Is it an example of embedded SQL or of using function calls? Explain.
3. Discuss different ways by which a join operation can be modelled using SQL.
4. Explain the process of recovering from a system crash.
5. How schedule is related to the term serializability? Describe with examples.

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ASSIGNMENT QUESTION PAPER
MCA (Second Year)
OPERATION RESEARCH

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. Distinguish between assignment and transportation problem.
2. How can OR models be classified? Explain.
3. An artist in the Shilparamam has 8 persons for whom the artist performs painting works. Arrival rate is passion stream and the service times are exponential. Average arrival rate is 5 per hour with an average sevice time of 20 minutes. Cost of waiting is Rs 120, while the cost of sevice is Rs. 75 each.

Calculate:

- i) The average length of the waiting time
 - ii) The average waiting time of an arrival.
 - iii) The average time which an arrival spends in the systems.
 - iv) The minimum cost service rate.
4. Describe the decision rules for purchase inventory model with two price breaks.
 5. Establish the relation between a linear programming problem and a two — person zero —sum game.

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OPERATION RESEARCH

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. Differentiate between strictly determinable games and non-strictly.
2. Solve the games by using maxmin (minimax) principle whose pay off matrix in given in table 1

	Player B			
Player A	B1	B2	B3	B4
A1	1	7	3	4
A2	5	6	4	5
A3	7	2	0	3

3. Write the steps to solution of a LP problem by graphical method. Also write the steps involved in solution of OR problem.
4. A manufacturing company uses certain part at a constant rate of 4500 units per year. Each unit costs Rs. 2/- and the company personal estimates that is costs Rs.50 to place an order. The carrying costs of inventory is estimated to be 20% per year, find the optimum site of each order and minimum yearly costs.
5. Solve the following LLP by dynamic programming

$$2x_1 + x_2 \leq 8$$

$$5x_1 + 2x_2 \leq 5$$

$$x_1 + x_2 \geq 0$$

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ASSIGNMENT QUESTION PAPER
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ARTIFICIAL INTELLIGENCE

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. Explain the State Space with the use of 8 Puzzle problem.
2. What is Hill Climbing? Explain about Simple Hill Climbing and Steepest Ascent Hill Climbing.
3. Illustrate best first search algorithm with suitable example.
4. Discuss various approaches to representing the knowledge.
5. What are the components of script? Write a script for a student go to examination hall.

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ARTIFICIAL INTELLIGENCE

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. Discuss the AI problem Characteristics in detail.
2. Explain mean-end analysis approach to solve AI problems with example.
3. What are well formed formulae? What are the steps involved in bringing acknowledge to clause form.
4. Explain about Bayesian Network with suitable example.
5. Explain rule based system with example.

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ASSIGNMENT QUESTION PAPER
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IMAGE PROCESSING

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. Discuss in detail about DFT and FFT.
2. Write detailed note on low pass filter and high pass filters.
3. Describe about colour contrast based edge enhancement technique.
4. Discuss in detail about image compression standards.
5. Discuss about sub region segmentation.

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IMAGE PROCESSING

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. Explain HADMARD Transform and DCT.
2. Discuss directional and Sobel edge enhancement filter.
3. Explain about compression at the time of image transmission.
4. Explain histogram based segmentation techniques.
5. Explain about morphological applications.