ANDHRA UNIVERSSITY

SCHOOL OF DISTANCE EDUCATION

ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

THEORY OF COMPUTATION

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. Prove that "L be the language accepted by NFA then there exists that accepts DFA".
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. State and prove pumping theorem for CFL.
4. Eliminate Null productions form the following CFG:

   $S \rightarrow ABA, \quad A \rightarrow aA \mid \varepsilon, \quad B \rightarrow bB \mid \varepsilon$
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 2020-2021

MCA (Second Year)

THEORY OF COMPUTATION

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. State and describe closure properties of regular language.
2. Construct PDA for the language: L = $\{0^m\ 1^n\ 0^{m+n} \mid m, n \geq 0\}$
3. Give the instantaneous description of PDA.
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 2020-2021

MCA (Second Year)

COMPUTER GRAPHICS

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. What is meant by resolution of a video display unit?
2. Explain the merits and demerits of scan line algorithm and flood fill algorithm.
3. State the blending function suitable for Bezier surface and explain the terms involved in it.
4. What are the applications of viewing transformation? Discuss.
5. Distinguish between the transformations performed in 2-D graphics and 3D graphics. Explain how many matrices are needed to define each of the basic transformations.

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

COMPUTER GRAPHICS

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. How the size of frame buffer and resolution is related? Explain.
2. Discuss about the super sampling approach followed the antialiasing.
3. Demonstrate that Bezier curve in axis independent.
4. Demonstrate the working of Sutherland Hodgeman algorithm with suitable example.
5. Explain the following:
   I) Polygon clipping
   II) Text clipping

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

FILE STRUCTURES

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. What are the strength and weaknesses of CD-ROM‘s? Discuss.
2. Discuss about different buffering strategies.
3. Explain in detail about Space Fragmentation.
4. Discuss about different file replacement strategies.
5. What is a virtual tree? Explain.

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

FILE STRUCTURES

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. Describe the organization of CD-ROM in detail.
2. Explain different methods of field organization in detail.
3. What are the methods used for organising the records of a file? Discuss.
4. Differentiate between sequential and direct access search with an example.
5. What are the operations that can be performed on indexed sequential file? Explain. Also explain the uses of inverted files.

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

DESIGN AND ANALYSIS OF ALGORITHMS

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. Differentiate between Bigoh and Omega notation with example.
2. Explain the properties of an algorithm with an example.
3. Explain the Strassen's matrix multiplication.
4. Write a non-recursive algorithm of In-order traversal of a tree and analyze its time complexity.
5. Explain the classes of NP-hard and Np-complete.

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

DESIGN AND ANALYSIS OF ALGORITHMS

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. Write the pseudo code for expressing algorithms.
2. Describe closest pair and convex Hull problems with example.
3. Write Greedy algorithm to generate shortest path.
4. Write recursive back tracking algorithm.
5. Discuss the approximation algorithms of np-hard problems in brief.

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

Operating systems

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. With the help of neat block diagram, describe the operating system structure.
2. What are the attributes of the process? Describe the typical elements of process control block.
3. Explain Critical section problem with its solutions.
4. What are the criteria based on which scheduling policies are evaluated? Explain.
5. Write Banker's algorithm to avoid the deadlock problem. Also include safety algorithm.

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

Operating systems

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. What is an Interrupt? Describe different types of Interrupts.
2. With examples, explain different types of systems calls and their uses.
3. Describe different solutions for two-process synchronization.
4. Describe round robin and feedback scheduling policies.
5. Explain about mass-storage structure.

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

DATA COMMUNICATION AND NETWORKS

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. Identify the five components of a data communications system.
2. How does information get passed from one layer to the next in the internet model?
3. Explain about the three types of transmission impairment.
4. Explain about CRC code with an example.
5. Explain about gigabit Ethernet.

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

DATA COMMUNICATION AND NETWORKS

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. Name the four basic network topologies, and cite an advantage of each type.
2. How do the layers of the OSI model?
3. Explain about Transmission of Digital Signals.
4. Explain about HDLC.
5. Explain about ARP.

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

DATABASE MANAGEMENT SYSTEMS

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. Describe the overall system structure of database management systems.
2. How to develop ER diagram? Explain with example.
3. Explain bout various database design strategies.
4. What are the different recovery technique used in transaction failures? Discuss.
5. How does the granularity of data items effect the performance of concurrency control? Explain.

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

DATABASE MANAGEMENT SYSTEMS

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. Explain the problems with file systems and discuss how DBMS overcomes these problems.
2. Describe about extended entity relationship model.
3. Discuss the differences between sub queries and correlated queries.
4. How system crash and media failure occur? Explain.
5. What is schedule? What is interleaved schedule? Describe with examples.

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

OPERATION RESEARCH

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. What are the advantages and limitation of LP problem?
2. Explain minimax and maxmin principle used in the theory of games.
3. Discuss what is “Wilson Hami’s SimpleEOQ”.
4. Discuss about the applications of dynamic programming.
5. Establish the relation between a linear programming problem and a two — person zero —sum game.

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

OPERATION RESEARCH

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. Explain the four elements that characterize a sequencing problem.
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. 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.
4. Define Bellmen's principle of optimality.
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 2020-2021

MCA (Second Year)

ARTIFICIAL INTELLIGENCE

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. Explain the State Space with the use of Water Jug Problem.
2. Write about A* algorithm with suitable example.
3. What do you understand by a conceptual dependency graph? Give the conceptual dependency graph for the sentence? Mary drove her car to office".
4. Explain about Dempster Safer theory with suitable example.
5. Differentiate procedure knowledge and declarative knowledge.

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

ARTIFICIAL INTELLIGENCE

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. Differentiate the DFS and BFS with merits and demerits.
2. Solve the following crypt arithmetic problem
   SEND + MORE = MONEY
3. Write about semantic nets with example.
4. Describe dependency directed backtracking with example.
5. State and explain about frame problem.

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

IMAGE PROCESSING

ASSIGNMENT-1

Marks 20

Answer All questions. All question carry equal marks.

1. What is Histogram equitation? Write the algorithm for it.
2. What are the properties of FFT? Discuss
3. Explain about images processing.
4. Explain the design of low and high pass filters.
5. Describe about compression at time of images transmission.

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ASSIGNMENT QUESTION PAPER 2020-2021

MCA (Second Year)

IMAGE PROCESSING

ASSIGNMENT-2

Marks 20

Answer All questions. All question carry equal marks.

1. Describe about decision of contract based on histogram.
2. Explain about HADMARD transform.
3. What are smoothing filters? Give comparative study of there filters.
4. What are the advantages of filters in frequency domain? Discuss.
5. Explain run length encoding and contour coding techniques.