PAPER ID-420735

Printed Page: 1 of 1
Subject Code: RCAI601

Roll No: 1 9 0 0 0 5 0 0 6 0 0 5 9

MCAINT
(SEM VI) THEORY EXAMINATION 2021-22
DATABASE MANAGEMENT SYSTEMS

Time: 3 Hours *Total Marks: 70*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. **Attempt *all* questions in brief.** **2 x 7 = 14**

a.	What is DBMS?
b.	What is data abstraction?
c.	Differentiate between Instance and Schemas.
d.	What do you mean by DDL and DML ?
e.	Define the term domain integrity.
f.	List various operations of relational algebra.
g.	List types of Serialazability.

SECTION B

2. **Attempt any *three* of the following:** **7 x 3 = 21**

a.	What are advantages of using DBMS over traditional file system?
b.	What are characteristics of relational data model?
c.	Write a note on data definition language and data manipulation language of SQL.
d.	What is primary and secondary indexing in DBMS.
e.	What is Transaction. Discuss various ACID properties of Transaction.

SECTION C

3. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a)	Explain the three tier architecture of DBMS. Also differentiate between logical independence and physical independence.
(b)	Draw the E-R diagram of your institute with asset of teachers and a set of students. Teachers offer various subjects to different classes.

4. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a)	What do you mean by referential integrity? Explain the concept of Foreign key with suitable example.
(b)	What do you mean by functional dependency. Differentiate between Partial and full functional dependency.

5. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a)	What are aggregate functions used in SQL? Explain with an example.
(b)	What is cursor? Differentiate between implicit cursor and explicit cursor.

6. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a)	Briefly discuss query execution in DBMS with suitable example.
(b)	Write SQL syntax for the following with example: (i) SELECT (ii) ALTER (iii) UPDATE

7. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a)	Briefly discuss on the two phase locking protocol used in concurrency control. How does it guarantees serializability.
(b)	What do you understand by Distributed Database System(DDBMS).Also discuss types of fragmentation available in DDBMS.

PAPER ID-420423

PAPER ID-420159

Printed Page: 1 of 2
Subject Code: RCAI602

Roll No: 1 9 0 3 5 6 0 0 5 9

MCAINT
(SEM VI) THEORY EXAMINATION 2021-22
GRAPH THEORY

Time: 3 Hours *Total Marks: 70*

Note: Attempt all Sections. If you require any missing data, then choose suitably.

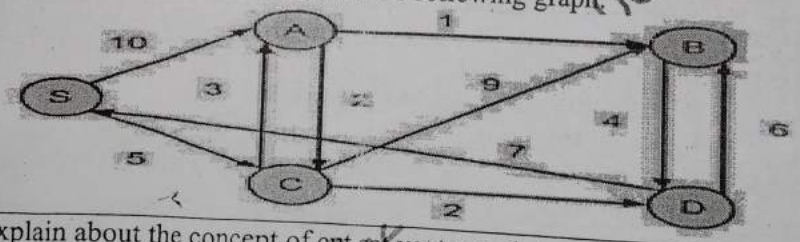
SECTION A

1. Attempt *all* questions in brief. **2*7 = 14**

Q.no	Questions	Marks	CO
(a)	What do you understand by Trees?	2	2
(b)	Define Graphs and Subgraph.	2	1
(c)	What do you understand by Rooted and Binary trees?	2	2
(d)	What do you understand by Path and Circuits?	2	1
(e)	What do you understand by Vector space of a graph?	2	3
(f)	What do you understand by Graph Coloring?	2	4
(g)	Prove that a simple graph with n vertices must be connected if it has more than (n-1)(n-2)/2 edges	2	5

SECTION B

2. Attempt any *three* of the following: **7*3 = 21**

Q.no	Questions	Marks	CO
(a)	Find Euler's formula for the planar graphs if all the cycles in the graph are of length r or above.	7	5
(b)	Discuss about the Spanning trees. What do you mean by Weighted graph? Apply Dijkstra's algorithm to find out the shortest path from vertex 'S' to all other vertices int the following graph: 	7	2
(c)	Explain about the concept of cut set vector and circuit vector.	7	3
(d)	Define closed walk, open walk, path and circuit. Take a graph of your choice and give an example to each one.	7	4
(e)	For maximal planar graph G, prove or disprove the following: (i) If the number of vertices is less than or equal to 11 then G has minimum degree less than or equal to 4. (ii) If the number of vertices is greater than or equal to 4 then G has minimum degree greater than or equal to 3. (iii) Every 5-connected maximal planar graph has at least 12 vertices.	7	1

PAPER ID-420159

Subject Code: RCAI602

Roll No: 5 0 0 5 9

MCAINT

(SEM VI) THEORY EXAMINATION 2021-22

GRAPH THEORY

SECTION C

3. **Attempt any *one* part of the following:** 7*1 = 7

Q.no	Questions	Marks	CO
(a)	Explain about the Fundamental circuit in digraph. What is the concept of Counting of labeled and unlabeled trees?	7	5
(b)	What are Cut-sets and cut vertices? What are Planar graphs?	7	2

4. **Attempt any *one* part of the following:** 7*1 = 7

Q.no	Questions	Marks	CO
(a)	Briefly discuss about the Euler and Hamiltonian graphs using anappropriate example of Graph representation.	7	1
(b)	Explain about the concept of Orthogonal vectors and subspaces, What do you understand by the Incidence Matrix of graph?	7	3

5. **Attempt any *one* part of the following:** 7*1 = 7

Q.no	Questions	Marks	CO
(a)	Show that the chromatic polynomial of a graph of n vertices satisfies inequality $P_n(\lambda) \geq \lambda(\lambda-1)^{n-1}$	7	4
(b)	Define the following. (i) Polya's theorem (ii) Graph theoretic algorithm.	7	5

6. **Attempt any *one* part of the following:** 7*1 = 7

Q.no	Questions	Marks	CO
(a)	Define the following. (i) Combinatorial and Geometric dual. (ii) Complete graph.	7	2
(b)	Discuss about the need and implementation of Traveling sales man problem in Graph Theory.	7	1

7. **Attempt any *one* part of the following:** 7*1 = 7

Q.no	Questions	Marks	CO
(a)	Define the following. (i) Cut set matrix. (ii) Path matrix. (iii) Adjacency matrices. (iv) Rank Nullity theorem.	7	3
(b)	Define the chromatic number of a graph. What is four color conjectures? Discuss with the help of example.	7	4

PAPER ID-420423

Subject Code: RCAI604

Roll No: 1 8 0 0 2 5 8 8 6 0 5 9

MCAINT

(SEM VI) THEORY EXAMINATION 2021-22

INTRODUCTION TO AUTOMATA THEORY & LANGUAGES

Time: 3 Hours ***Total Marks: 70***

Note: Attempt all Sections. If require any missing data; then choose suitably.

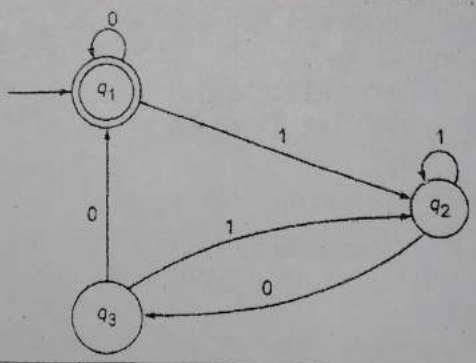
SECTION A

1. Attempt *all* questions in brief. **2*7 = 14**

a.	Define alphabets and strings.
b.	Differentiate between dead state and not reachable states.
c.	Differentiate between Kleene closure and Positive closure with suitable examples.
d.	What is null and unit production?
e.	What is Chomsky Normal Form?
f.	Discuss need of stack in PDA.
g.	Define instantaneous description with reference to Turing machine.

SECTION B

2. Attempt any *three* of the following: **7*3 = 21**

a.	Differentiate between Deterministic Finite Automata (DFA) and Nondeterministic Finite Automata (NFA).
b.	Construct a DFA, which accepts set of all strings over {0, 1}divisible by '3'.
c.	Consider the grammar G= ({S, A}, {a, b}, P, S), where Production P consist of S→AA, A→AAA, bA, Ab, a. Construct a derivation tree for the string bbaaaab.
d.	State Arden's theorem and find the regular expression for the given DFA using it. 
e.	Write a CGF which generates odd number of palindromes for binary numbers.

SECTION C

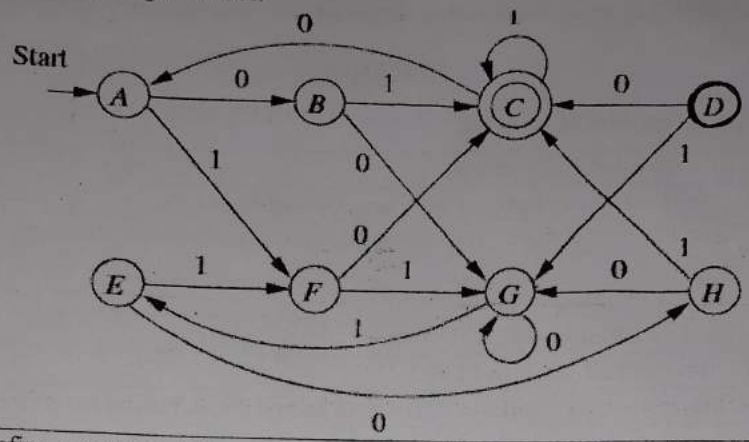
3. Attempt any *one* part of the following: **7*1 = 7**

a.	Differentiate between Mealy and Moore machines.
b.	Discuss pumping Lemma with suitable example.

Roll No:

MCAINT
(SEM VI) THEORY EXAMINATION 2021-22
INTRODUCTION TO AUTOMATA THEORY & LANGUAGES

4. Attempt any one part of the following: **7*1 = 7**

a.	Minimize the given DFA. 
b.	Define grammar. When is a grammar said to be ambiguous? Explain with suitable example.

5. Attempt any *one* part of the following: **7*1 = 7**

a.	Write the formal definition of push down automata. Construct a PDA that accepts language L = {wcw^r such that w ε (a,b) *}.
b.	Define a Push Down Automata (PDA). Also differentiate between Deterministic PDA and Non-deterministic PDA.

6. Attempt any *one* part of the following: **7*1 = 7**

a.	Construct a Turing Machine(TM) for the language L = {0^n1^n} where n≥1.
b.	Write short note on (i) Universal Turing Machine (ii) Multi-Tape Turing Machine

7. Attempt any *one* part of the following: **7*1 = 7**

a.	Define Post Corresponding Problem (PCP)? Check does PCP with two lists X= (0101, 000111, 001, 10, 01, 00) and Y= (0101000, 11, 1001, 100, 10, 0) have a solution?
b.	What is Turing Machine? Explain the decidable and undecidable problems with reference to Turing machine.

PAPER ID-420575

Subject Code: RCAI605

Roll No: 1 9 0 0 5 0 0 6 0 5 9

MCAINT
(SEM VI) THEORY EXAMINATION 2021-22
UNIVERSAL HUMAN VALUES & PROFESSIONAL ETHICS

Time: 3 Hours *Total Marks: 70*

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2*7 = 14

a.	Show the values of material things.
b.	Write full form of SVDD, SSDD, SSSS.
c.	Illustrate that how harmony from family order is related to world family order.
d.	Judge that animal and human order is conscious unit.
e.	Assess that all orders of natures are cyclic-keeps going back, cannot develop.
f.	What do you mean by profession?
g.	The absence of Right Understanding creates the disharmony with other humans and rest of nature. Justify.

SECTION B

2. Attempt any *three* of the following: 7*3 = 21

a.	Discuss value education? Explain need of value education?
b.	Are the activities in 'I' are temporary or continuous or temporary? Justify.
c.	Explain the difference (Disrespect) in relationships on the basis of body, physical facilities, or beliefs.
d.	Classify the four orders in nature and analyze them.
e.	Decide the understanding perceived by definitiveness of ethical human conduct. Conclude that this definitiveness desirable.

SECTION C

3. Attempt any *one* part of the following: 7*1 = 7

a.	Illustrate "Self-exploration is a process of dialogue between 'what you are' and 'what you really want to be' ".
b.	Demonstrate the process of verification of proposals on the basis of our natural acceptance with example.

4. Attempt any *one* part of the following: 7*1 = 7

a.	Determine the needs of Body and I.
b.	Show that realization and understanding lead to definitiveness of human conduct.

5. Attempt any *one* part of the following: 7*1 = 7

a.	Outline the term justice with the process? Is it a continuous or temporary need?
b.	Analyze the trust in todays scenario. Illustrate the doubts regarding trust we mean today.

6. Attempt any *one* part of the following: 7*1 = 7

a.	What do you mean by co-existence? How are units in co-existence being in space.
b.	Discuss the four orders in aspect of Things, Activity, Innateness and conformance.

7. Attempt any *one* part of the following: 7*1 = 7

a.	Argue pragmatic implications of value-based living at four levels.
b.	Critically examine the issues in professional ethics in the current scenario. List any five unethical practices in profession today and the methods being tried to curb them.