Enrollment No.....

Master of Technology
First Semester Main Examination, Dec-2020
Mathematical Foundation of Computer Application [MTCTA101]

Time: 3:00 Hrs **Max Marks 70**

Note: Attempt any five questions out of eight. All question carry equal marks.

Q.1 Explain Sets & Operation on Sets & Identity Sets. Explain Function Inverse Function & Composition Of Function.

Q.2 Write the Introduction of Finite State Machine. Explain the term Conjunction, Disjunction & Negation with Example.

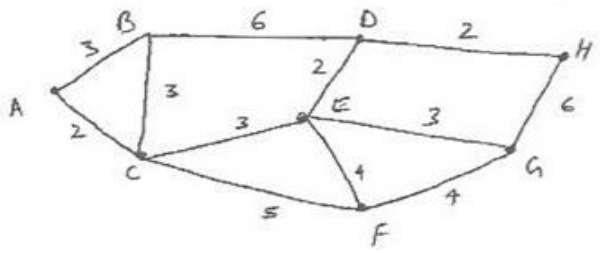
Q.3 Write the Introduction of Finite State Machine with example? Explain Finite State Machine as models of physical system.

Q.4 Express in the principle disjunctive normal form: f (x, y, z) = (x' y)' (x' + xyz')

Q.5 Explain Normal Form in Prepositional Logic & Logic Consequences. What is the Induction of Discrete Numeric Function? Explain?

Q.6 Explain the Introduction of Recurrence relational Algorithm

Q.7 What is minimum spanning tree of the graph? Execute Prim's algorithm to find minimum spanning of the following graph.



Q.8 Solve the recurrence relation ar+2— 5ar+1 +6ar = 2 by the method of generating functions satisfying the initial conditions $a_0 = 1$ and $a_1 = 2$.

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First Semester Main Examination, Dec-2020

Programming System [MTCTA102]

Time: 3:00 Hrs **Max Marks 70**

Note : Attempt any five questions out of eight.
All questions carry equal marks.

Q.1 Explain Hashing procedure. Give four advantages of a chained hash table over open addressing.

Q.2 What are the different tree traversal techniques? Write a non-recursive algorithm for in order tree traversal?

Q.3 What are the different ways to represent linked list in memory? Explain by giving proper examples. Also write the advantages and disadvantages of each type?

Q.4 Explain Branch and bound techniques in details?

Q.5 Write an algorithm for optimal solution of Knapsack problem using dynamic programming technique?

Q.6 Explain in detail about Approximation algorithm for NP Hard problem with example.

Q.7 What is Dynamic programming? Explain briefly.

Q.8 Discuss the classes P, NP, NP complete and NP hard with example? How can we show that the problem is NP complete?

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First Semester Main Examination, Dec-2020

Object Oriented Modeling and UML [MTCTA103]

Time: 3:00 Hrs **Max Marks 70**

Note: Attempt any five questions out of eight.
All questions carry equal marks.

Q.1 How does object-oriented approach differ from the object-based approach?

Q.2 What is Polymorphism? How Polymorphism achieved in C++, How sample code fragment

Q.3 How sequence diagram is different from collaboration diagram?

Q.4 Draw a sequence diagram for withdrawing money from the ATM?

Q.5 What are the basic UML modeling mechanisms?

Q.6 List at least 9 graphical diagrams defined by UML and explain any 3 of them.

Q.7 What is data hiding? Explain different access modifiers?

Q.8 Differentiate between the following: -
(i) Process and Thread
(ii) Signal and Event
(iii) State Machines and State Chart Diagrams
(iv) Time and space

Enrollment No.....

Master of Technology
First Semester Main Examination, Dec-2020
Advanced Database Management System (MTCTA-104)

Time: 3:00 Hrs **Max Marks 70**

Note : Attempt any five questions out of eight.
All question carry equal marks.

Q.1 **(a) Discuss different type of database management system with advantages and disadvantages.**
(b)Why the normalization process is necessary for a good database design?

Q.2 **(a) What are the different techniques for database recovery? Discuss in details.**
(b) What are different types of relational query languages?

Q.3 **(a) Discuss in detail concurrency control in case of distributed database management systems.**
(b) What are the different advantages of a distributed database management system?

Q.4 **(a) Write short notes on deductive database.**
(b) What is the use of data warehouse?

Q.5 **(a) Difference between relational and object relational database.**
(b) Explain need for object database.

Q.6 **(a) Explain data loading and its types.**
(b) What is the objective of data mining?

Q.7 **(a) What is the use of online analytical processing?**
(b) Explain with suitable example 'Star Schema'

Q.8 **Write short notes on -**
(a) Spatial Database.
(b) Mobile Database.

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Master of Technology

First Semester Main Examination, Dec-2020

Computer Graphics and Multimedia (MTCTA 105)

Time: 3:00 Hrs **Max Marks 70**

Note : Attempt any five questions out of eight.
All questions carry equal marks.

Q.1 **(a) What are the types of computer graphics? What are the categories of computer graphics? What are the applications of computer graphics?**
(b) What do you mean by display processing unit?

Q.2 **(a) What do you mean by scan conversion?**
(b) What is the difference between a diffuse reflecting surface and a specular reflector?

Q.3 **(a) What are the steps involved in general fixed point scaling? Hence scale a triangle A (0, 0) B (5, 0) and C (5, 5) to half its size.**
(b) What is clipping? Why clipping is required in computer graphics?

Q.4 **(a) Find the transformed coordinates of the triangle with vertices A (10, 10) B (25, 35) and C (40, 10) under the rotation in anticlockwise direction about the point (25, 10) by an angle 45^0.**
(b) Distinguish between parallel and perspective projection.

Q.5 **(a) What do you mean by translation, scaling and rotation?**
(b) What is hidden surface removal?

Q.6 **(a) For what gourad shading is used? Why is it different with phong shading?**
(b) What are the properties of Bezier Curve?

Q.7 **(a) Explain XYZ color model and the CIE chromaticity diagram.**
(b) What are the components of multimedia system?

Q.8 **(a) Develop Bresenham's algorithm and indicate raster positions would be scanned by Bresenham's algorithm when scan converting a line from screen coordinate (1, 1) and (8, 5).**
(b) Why the Sutherland Hodgman polygon clipping algorithm works for only convex clipping region?