Code: 19A532T

II B.Tech. I Semester Supplementary Examinations July/August 2022

Digital Logic Design and Computer Organization

(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Elaborate on the basic functional units of a computer system?	7M	CO1	L2
	b)	Discuss different types of computers?	7M	CO1	L2
		OR			
2.	a)	Describe the block diagram of a digital computer and explain how sequences of instructions are executed?	7M	CO1	L2
	b)	Give the two binary numbers x=1010100 and Y=1000011, perform the subtraction x-y using 2's complement?	7M	CO1	L5
		UNIT–II			
3.	a)	Illustrate the design of a Binary Full-Subtractor using Universal gates?	7M	CO2	L4
	b)	Draw circuit for parallel register transfer using Flip-flops?	7M	CO2	L6
		OR			
4.	a)	Implement the following multi output combinational logic circuit using a 4-to-16 line decoder? F1 = (1,2,4,7,8,11,12,13) F2 = (2,3,9,11)	7M	CO2	L6
	b)	Define Multiplexer? Elaborate on the process of designing a Multiplexer in detail?	7M	CO2	L4
		UNIT–III			
5.	a)	What is the binary code of the number 6.25 and how it is stored as a single-precision float number in current-day computers?	7M	CO3	L1, L2
	b)	Write about how real numbers are added and subtracted in computers. Preferably illustrate the same algorithmically?	7M	CO3	L4
		OR			
6.	a)	Elaborate the instruction cycle with a neat flow chart?	7M	CO3	L2
	b)	With the help of a flowchart describe multiplication operation on floating-point numbers?	7M	CO3	L2
		UNIT–IV			
7.	a)	Explain the organization of CPU registers that are connected to common busses with a neat diagram?	7M	CO4	L2
	b)	Define Memory? A neat diagram explaining memory hierarchy and the need for cache memory?	7M	CO4	L1, L2
		OR			
8.	a)	Illustrate the effect of the associative-mapped technique for cache memory?	7M	CO4	L3
	b)	Define ROM? Describe Read-Only memory with its types?	7M	CO4	L2
		UNIT–V			
9.	a)	What is Interrupt? How interrupts are commonly handled? Explain?	7M	CO5	L1
	b)	Differentiate between a subroutine and an interrupt service routine?	7M	CO5	L2
		OR			
10.	a)	Compare three different nodes of I/O transfer: Programmed I/O, Interrupt initiated I/O, and DMA?	7M	CO5	L4
	b)	Explain the types of commands an I/O device receives when addressed by the CPU?	7M	CO5	L2

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R-19

Code: 19A532T

II B.Tech. I Semester Supplementary Examinations July/August 2022

Data Structures through Python

(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	List and Discuss built-in class attributes.	6M	CO1	L1,L2
	b)	Create a python program to call a class method from another method of the same class?	8M	CO1	L6
		OR			
2.	a)	How to use self-parameter in python? Explain with suitable example.	7M	CO1	L1,L2
	b)	Differentiate between Class Method and Static Method.	7M	CO1	L2
		UNIT–II			
3.	a)	What is Exception? Explain the Exception handling mechanism in python.	10M	CO2	L1,L2
	b)	What is the use of assert keyword in python.	4M	CO2	L1
		OR			
4.	a)	What is iterator object in python? Explain iter() and next() methods in python.	8M	CO2	L2
	b)	Explain Array2D ADT and its operations.	6M	CO2	L2
		UNIT–III			
5.	a)	How can you organize data in Multidimensional Array? Explain.	8M	CO3	L1,L2
	b)	Explain methods in MAP ADT.	6M	CO3	L2
		OR			
6.		Write a Python program to implement operations of Circular linked list.	14M	CO3	L6
		UNIT–IV			
7.	a)	Write a Python code to perform Recursive Binary Search.	8M	CO4	L6
	b)	Describe the recursive call tree for Binary Search.	6M	CO4	L2
		OR			
8.	a)	Describe the merge sort Algorithm with suitable example.	7M	CO4	L2
	b)	Write a Python Program to implement Quicksort.	7M	CO4	L6
		UNIT–V			
9.	a)	Explain Traversal methods on the Binary Tree.	7M	CO5	L2
	b)	Construct a Maximum Heap with the following elements. {2,13,8,4,6,10}	7M	CO5	L6
		OR			
10.	a)	Write a python program to perform operations on binary search trees	8M	CO5	L6
	b)	Build a Binary Search Tree from the following sequence: Preorder Traversal: {20,16,5,18,17,19,60,85,70}	6M	CO5	L6

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Code: 19AC34T

II B.Tech. I Semester Supplementary Examinations July/August 2022

Life Sciences for Engineers

(Common to CE, ME & CSE)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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		Marks	CO	Blooms Level

UNIT–I

		Marks	CO	Blooms Level
1.	Describe meant by classification? Write the importance of Classification?	14M	CO1	2

OR

| 2. a) | Explain the five kingdom classification of living organisms? | 7M | CO1 | 2 |
| b) | Describe is Endoplasmic reticulum? Write their structure and important functions and draw the labelled diagram? | 7M | CO1 | 2 |

UNIT–II

| 3. a) | Describe the structure of DNA & RNA? | 7M | CO2 | 2 |
| b) | Explain Lock and Key Model and Induced fit model? | 7M | CO2 | 2 |

OR

| 4. | Describe the Biomolecules and write functions and types of biomolecules? | 14M | CO2 | 4 |

UNIT–III

| 5. | Describe about Bioenergetics and types of Bioenergetics? | 14M | CO3 | 2 |

OR

| 6. | Discuss the mechanism of photosynthesis in plants? | 14M | CO3 | 4 |

UNIT–IV

| 7. a) | Describe the sequential steps in the replication of DNA? | 7M | C04 | 2 |
| b) | Write the importance of Genetic code? | 7M | C04 | 1 |

OR

| 8. | Describe the Gene Disorders in Humans? | 14M | C04 | 4 |

UNIT–V

| 9. | Describe the Biosensors, types and applications? | 14M | CO5 | 2 |

OR

| 10. | Explain the Transgenic species and process in animals? | 14M | CO5 | 2 |

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Code: 19AC31T

II B.Tech. I Semester Supplementary Examinations July/August 2022
Partial Differential Equations and Complex Variables
(Common to All Branches)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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		Marks	CO	Blooms Level

UNIT–I

1. a) Find the Laplace Transform of $e^{2t} + 4t^3 - 2\sin 3t + 3\cos 3t$ |7M | CO1 | L1

   b) Find the L.T of $\left(t^2 + 1\right)^2$ | 7M | CO1 | L1

OR

2. Find $L\left\{e^{-3t}\int_0^t \frac{\sin t}{t}\,dt\right\}$ | 14M | CO1 | L1

UNIT–II

3. Find inverse L.T of $\dfrac{5s-2}{s^2(s+2)(s-1)}$ | 14M | CO2 | L1

OR

4. Using convolution theorem , find $L^{-1}\left\{\dfrac{1}{(s+a)(s+b)}\right\}$ | 14M | CO2 | L3

UNIT–III

5. Obtain the Fourier series for $f(x) = x - x^2$ in the interval $[-f, f]$. Hence Show that

$$\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \ldots\ldots\ldots\ldots = \frac{f^2}{12}$$ | 14M | CO3 | L3

OR

6. Find the half range sine series for $f(x) = x(f - x)$ in $0 < x < f$ deduce that

$$\frac{1}{1^3} - \frac{1}{3^3} + \frac{1}{5^3} - \frac{1}{7^3} + \ldots\ldots\ldots\ldots = \frac{f^2}{32}$$ | 14M | CO3 | L1

UNIT–IV

7. Use separation of variables to solve $\dfrac{\partial^2 u}{\partial x^2} = \dfrac{\partial u}{\partial y} + 2u$ in the form $u = f(x)g(y)$.

   Obtain the solution satisfying $u = 0,\ \dfrac{\partial u}{\partial x} = 1 + e^{-3y}$ when $x = 0$ for all values of y. | 14M | CO4 | L3

OR

8. A homogeneous rod of conducting material of length 100 cm has its ends kept at zero temperature and the temperature initially is

$$u(x,0) = \begin{cases} x & ;0 \le x \le 50 \\ (100 - x) & ;50 \le x \le 100 \end{cases}$$

   Find the temperature $u(x,t)$ at any time. | 14M | CO4 | L3

UNIT–V

9. Find the conjugate harmonic function of the harmonic function $u = x^2 - y^2$ | 14M | CO5 | L1

OR

10. Evaluate $\displaystyle\int_c \dfrac{e^{2z}}{(z-1)(z-2)}dz$ where $c : |z| = 3$. | 14M | CO5 | L5

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II B.Tech. I Semester Supplementary Examinations July/August 2022
Web Programming
(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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Marks

UNIT–I

1. a)	Explain the target Attribute with values.	7M
b)	What is the Internationalization Activity	7M

OR

2. a)	Explain the structure of web document with example program	7M
b)	What is URL and how URL is specified?	7M

UNIT–II

3. a)	What is Accessible Tables in html	7M
b)	What is focus in HTML form?	7M

OR

4. a)	Write about IMG tag with attributes. How to insert video or audio using elements in web page.	7M
b)	Structure the Forms with <fieldset> and <legend> Elements with example program.	7M

UNIT–III

5.	Define an HTML Table. How to set the border spacing for a table, using the CSS border-spacing property.	14M

OR

6. a)	How to set Multiple Backgrounds using CSS	7M
b)	How internal DTD works? Explain with example program	7M

UNIT–IV

7. a)	Write a java script code to handle onsubmit and onload events.	7M
b)	Discuss the advantages of Java Script.	7M

OR

8.	What are operators? Explain operators in java script	14M

UNIT–V

9. a)	How to add jQuery to a web page	7M
b)	Differentiate Ajax with jQuery	7M

OR

10. a)	What are the methods used in jQuery to remove existing HTML elements.	7M
b)	Write about jQuery width() and height() Methods	7M

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R-19

Code: 19A531T

II B.Tech. I Semester Supplementary Examinations July/August 2022

Database Management Systems

(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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Marks

UNIT–I

1. a) What are five main functions of a database management administrator?   7M

   b) What are the advantages of DBMS? Explain.   7M

OR

2. a) Write about instances and schemas.   4M

   b) Explain about types of database languages with syntax and example?   10M

UNIT–II

3. a) Explain the distinctions among the terms primary key, candidate key, and super key.   7M

   b) What is an E-R model? Explain with suitable examples, entity, entity sets, and attributes.   7M

OR

4. a) Draw ER diagram for the university database incorporating all the ER notations with explanation.   7M

   b) How can we translate an ER diagram into SQL statements to create tables? How are entities mapped into relations? How are relationships sets mapped?   7M

UNIT–III

5. a) Explain the differences between Triggers and constraints.   7M

   b) Write about Views? Explain how views are created, updated and deleted with examples.   7M

OR

6. a) Why are stored procedures important? How do we declare stored procedures?   7M

   b) What are Sub Queries how they are implemented in SQL?   7M

UNIT–IV

7. a) Define multivalued dependencies. Describe Fourth Normal form with an example.   7M

   b) List out the problems related to Decomposition?   7M

OR

8. a) What is normal form? Explain with example, 3NF and BCNF.   10M

   b) Briefly discuss about lossless-join decomposition with example.   4M

UNIT–V

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II B.Tech. I Semester Supplementary Examinations July/August 2022

Discrete Mathematics
(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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Marks

UNIT–I

1. a) Construct truth table for the following formula
   $(P \wedge Q) V (\sim P \wedge \sim Q) V (P \wedge \sim Q)$ 7M

   b) Write Converse, Inverse and Contrapositive of the following statements.
      i) $\sim P \rightarrow \sim Q$
      ii) $P \rightarrow \sim Q$ 7M

OR

2. a) Find Principle Conjunctive Normal form for the following formula.
   $P \rightarrow ((P \rightarrow Q) \wedge \sim (\sim Q V \sim P))$ 8M

   b) Obtain PDNF for the following formula. $(\sim P \rightarrow R) \wedge (Q < - > P)$ 6M

UNIT–II

3. State relation and explain properties of binary relations with examples.   14M

OR

4. a) What is lattice? Explain lattice properties.   7M

   b) Draw the Hasse diagram for the positive divisors for 36.   7M

UNIT–III

5. a) Show that if a, b are arbitrary elements of a group G, then $(ab)^{-1}$
   $= b^{-1} a^{-1}$ if and only if G is abelian   10M

   b) How many committees of 5 or more can be chosen from 9 people?   4M

OR

6. a) Explain pigeonhole principle with example.   7M

   b) A certain question paper contains 2 parts A and B each containing 4 questions. How many different ways a student can answer 5 questions by selecting at least 2 questions from each part?   7M

UNIT–IV

7. Find the generating function for the following sequence.
   i) $1^2, 2^2, 3^2, \ldots$ ii) $1^3, 2^3, 3^3, \ldots$ 14M

OR

8. Solve the recurrence relation $a^2_{n+2} - 5a^2_{n+1} + 4a^2_n = 0$ with $a_0 = 4$ and $a_1 = 12$.   14M

UNIT–V

9. a) What is Hamiltonian graph? Explain with an example.   8M

   b) Explain the following terms with examples.
      i) Complete graph   ii) Dual graph   6M

OR

10. a) Define a graph and explain various representations of graph with examples.   10M

    b) Define Planner graph with examples.   4M

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