H.T No: | | | | | | | | | | | **R18** **Course Code: A30506**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech III Semester Supplementary Examinations August-2023

Course Name: DISCRETE MATHEMATICS

(Common for CSE, IT, CSC & CSM)

Date: 08.08.2023 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks. **10x2=20M**

1. If R = {(0,0), (2,2), (4,4)} is an equivalence relation on {0,2,4} then find the equivalence class. 2 M
2. Define Bijective function with example. 2 M
3. Define greatest common divisor. 2 M
4. Find the number of 3 combinations of 5 objects with unlimited repetitions. 2 M
5. Define the connectives NAND and NOR. 2 M
6. Write a short note on well Formed Formulas. 2 M
7. Define Monoid. 2 M
8. Find the dual of the Boolean function x V (y Λ F). 2 M
9. Define Chromatic number of a Graph. 2 M
10. Define Hamilton path and Hamilton cycle. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Let S be the set of all non- zero integers, and A = S X S. On A, define the relation R by (a, b) R (c, d) if and only if ad = bc. Show that R is an equivalence relation. 10M

OR

11. B). Let A = {1, 2, 3, 4, 6, 12}. On A, define the relation R by aRb if and only if a divides b. Prove that R is partial order on A. 10M

12. A). How many arrangements are there for the word MISSISSIPPI with no two pair consecutive same letters. 10M

OR

12. B). Find how many integers between 1 and 1000 are not divisible by 2, 3, 5 or 7. 10M

13. A). For any three propositions p, q, r, construct the truth table for the proposition (p → q) V (p →r). 10M

OR

13. B). Write down the following proposition in symbolic form and find its negation: "If all triangles are right-angled, then no triangle is equiangular". 10M

(P.T.O..)

14. A). Define the Ring and Field with example. 10M

OR

14. B). If * is an operation on Z defined by $x * y = x + y + 1$, prove that (Z, *) is an abelian group. 10M

15. A). State and prove Euler's formula. 10M

OR

15. B). Show that a simple undirected graph G is a tree if and only if G is connected and contains no cycles. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30461**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech III Semester Supplementary Examinations August-2023

Course Name: ANALOG & DIGITAL ELECTRONICS

(Common for CSE & IT)

Date: 10.08.2023 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks. **10x2=20M**

1. Describe the avalanche and Zener break down mechanism. 2 M
2. Write the Diode Current equation? 2 M
3. Identify the relation between α, β, γ of a BJT? 2 M
4. What is thermal runway? Write the condition for thermal stability. 2 M
5. Why we call FET as a voltage-controlled device? 2 M
6. Convert the following to decimal and then to octal. (i) (125F)16 (ii) (392)10 2 M
7. State and prove the De Morgan's Theorem. 2 M
8. Implement Ex-OR and Ex-NOR gates using only NOR gates? 2 M
9. Compare synchronous and asynchronous sequential circuits. 2 M
10. Distinguish between Mealy and Moore machines. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) Write short notes on Zener Diode and draw the characteristics of Zener Diode. 7M
ii) List the Applications of PN junction diode. 3M

OR

11. B). Draw the circuit of a full wave bridge rectifier and explain its working. Derive the expressions for I_{dc}, I_{rms}, PIV, P_{dc}, and efficiency (η). 10M

12. A). With neat sketches and necessary waveforms, explain the input and output characteristics of a BJT in CB configuration. 10M

OR

12. B). i) Compare the characteristics of CE, CB and CC amplifiers. 5M
ii) Explain the principle of operation & characteristics of UJT. 5M

13. A). Draw and explain the construction and operation of n-channel MOSFET with neat diagrams? 10M

OR

13. B). i) Determine a 15 bit Hamming code from given 11 bit data 10110101010, find the error and if any. 6M
ii) Simplify the Boolean expression: A'BC + AB'C' + A'B'C' + AB'C + ABC. 4M

(P.T.O.)

14. A). Simplify the following using K-map technique and draw the logic circuit $F(a, b, c, d) = \Sigma m(0, 1, 2, 10, 11, 14) + d(5, 8, 9)$. 10M

OR

14. B). i) Write short notes on full adder. 5M

ii) Implement 8*1 Multiplexer using 2*1 multiplexers. 5M

15. A). Explain the operation of a 4-bit Johnson counter and Ring counter using flip-flops and its applications. 10M

OR

15. B). Draw the logic diagram of a JK flip flop and using excitation table, explain its operation. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30513**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech III Semester Supplementary Examinations August-2023

Course Name: COMPUTER ORGANIZATION & ARCHITECTURE

(Common for CSE, IT, CSC, CSM, AID & AIM)

Date: 12.08.2023 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks. **10x2=20M**

1. What are the different phases of an Instruction Cycle? 2 M
2. What are input output instructions? 2 M
3. Write short notes about floating point data representation with example. 2 M
4. List the different Shift Micro operations. 2 M
5. What are the major types of Interrupts? 2 M
6. Distinguish between hardwired control and microprogrammed control unit. 2 M
7. Define parallel processing. 2 M
8. Explain pipeline hazard. 2 M
9. Write about virtual memory. 2 M
10. Define Memory Interleaving with example. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). What is RTL? Explain with suitable examples? What is its significance Instructions? 10M

OR

11. B). Explain about Addressing modes with example. 10M

12. A). Explain booth's multiplication algorithm with example. 10M

OR

12. B). Illustrate the process of fixed point addition and subtraction with a flow chart. 10M

13. A). Explain about micro programmed control unit with block diagram. 10M

OR

13. B). Discuss the need for DMA. Explain DMA controller in computer system. 10M

14. A). Explain briefly about arithmetic pipeline. 10M

OR

14. B). i) Discuss the demerits of pipeline processing. 5M
ii) Demonstrate cache coherency with example. 5M

15. A). What is the significance of cache memory and write about direct and associative mapping techniques. 10M

OR

15. B). Compare cache size Vs Block size with examples. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30507**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech III Semester Supplementary Examinations August-2023

Course Name: OBJECT ORIENTED PROGRAMMING

(Common for CSE & IT)

Date: 17.08.2023 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks. **10x2=20M**

1. The object-oriented programming simplifies software development and maintenance. Justify. 2 M
2. Do we need to import java.lang package always? Why? Justify. 2 M
3. Difference between abstract class and interface. 2 M
4. What is the use of multi-catch block? 2 M
5. Define the finalize method. 2 M
6. What is the scanner class? List its methods. 2 M
7. Define the collection interface. 2 M
8. What are the different types of JDBC drivers? 2 M
9. List the java AWT classes. 2 M
10. What is java Applet? What are its advantages? 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). What is package class? Explain the methods of package class. 10M

OR

11. B). Write a java program to find the greatest common divisor of two numbers. 10M

12. A). What is anonymous inner class? What are ways to create an anonymous inner class? Explain with suitable example. 10M

OR

12. B). Distinguish Checked Exceptions and Unchecked Exceptions. Write a program to Illustrate both types of exceptions. 10M

13. A). Examine the concept of Inter Thread Communication using Producer – Consumer Problem to use a buffer with single element. 10M

OR

13. B). What is BufferedOutputStream class? Explain its constructors and methods. 10M

14. A). What is the difference between ArrayList and Vector classes in collection framework? 10M

OR

14. B). Write a java program to connect java application with Oracle database having Employee table. 10M

(P.T.O..)

15. A). Write a Swing program to demonstrate Job registration form with the following data. 10M

i) Name
ii) Password
iii) Email
iv) Contact Number
v) Gender
vi) Languages Known
vii) City

When the submit button is pressed, display a message in label showing "Registration Successful".

OR

15. B). Use ActionEvent to design a user interface for login frame with user name and password. 10M
The username and password are verified with string "java".

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30509**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations August-2023
Course Name: DATABASE MANAGEMENT SYSTEMS
(Common for CSE, IT, CSC, CSD & AID)

Date: 19.08.2023 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks. **10x2=20M**

1. What is a data model? List the types of data models used. 2 M
2. Define a) Entity b) Attribute 2 M
3. How can you alter and destroy tables? 2 M
4. Define Null Values. 2 M
5. State about SELECT operation in Relational algebra. 2 M
6. List out the Problems related to decompositions. 2 M
7. List the types of serializability. 2 M
8. Define time stamp. 2 M
9. What is an index? How is it useful in data base? 2 M
10. What is cluster indexes? 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Compare File Processing system and DBMS. 10M

OR

11. B). Draw an E-R diagram for a banking enterprise with almost all components and explain. 10M

12. A). Illustrate Integrity constraint in relational model with appropriate examples. 10M

OR

12. B). Describe logical connectivity's of SQL. 10M

13. A). Discuss about Domain Relational calculus in detail. 10M

OR

13. B). Illustrate Multivalued dependencies and Fourth normal form with example. 10M

14. A). Explain ACID properties and Illustrate them through examples. 10M

OR

14. B). Describe Validation-based locking protocols. 10M

15. A). Write in detail about Hash based Indexing and Tree based Indexing. 10M

OR

15. B). What is B+ trees? Discuss about Dynamic Index Structure. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30531**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech III Semester Supplementary Examinations August-2023

Course Name: PYTHON PROGRAMMING

(Common for CE, EEE, ME, ECE, CSE, IT, CSC & CSM)

Date: 22.08.2023 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks. **10x2=20M**

1.	Interpret the process of Reading input from the key board.	2 M
2.	Distinguish between while and for loop.	2 M
3.	Outline the idea of Definite Iteration.	2 M
4.	What are Global Values and Global Constants?	2 M
5.	Determine the need of Lists.	2 M
6.	Classify the String Methods	2 M
7.	Show the difference between Classes and Functions.	2 M
8.	Discuss the Importance of Object Oriented programming.	2 M
9.	Summarize the tkinter module.	2 M
10.	Identify the need of widgets.	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	i) Discuss various operators available in python with example.	5M
	ii) Compare different repetition Structures with examples	5M
	OR	
11. B).	i) Illustrate the Principle of Types Conversion with an example.	5M
	ii) Discuss about Nested Decision Structures with an example.	5M
12. A).	i) Classify Process of Defining and calling of Void Function.	5M
	ii) Outline the features of Value-Returning Functions.	5M
	OR	
12. B).	i) Develop the steps to write a Python function that prints all factors of a given number.	5M
	ii) What is the purpose to use Math Module?	5M
13. A).	i) Demonstrate the comparison between lists, tuples, dictionaries and sets.	5M
	ii) Illustrate a Python program that interchanges the first and last characters of a given string.	5M
	OR	
13. B).	i) Discuss about recursive, and the Python function that recursively computes sum of elements in a list of lists. Sample Input: [1, 2, [3,4], [5,6]] Expected Result: 21	5M
	ii) Show a Python program read a word and print the number of letters, vowels and percentage of vowels in the word using a dictionaries.	5M

(P.T.O..)

14. A). i) Evaluate the implementation of Object Oriented Programming. 5M

ii) Identify the Python program that overloads + operator, to add two objects of a class. 5M

OR

14. B). i) Can you Analyze inheritance class with suitable example in Python? 5M

ii) Show the working of method overriding works in Python? Explain with an example. 5M

15. A). i) Construct the Two Dimensional Shapes in Python. 5M

ii) Summarize the process of Display text with Label Widgets in Python. 5M

OR

15. B). i) Demonstrate the behavior of terminal based programs and GUI based Programs. 5M

ii) Determine the implementation of Button Widgets and info Dialog Boxes in Python. 5M

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