# 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 $x \vee (y \wedge F)$.          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 $(p \rightarrow q) \vee (p \rightarrow r)$.          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

<div align="center">**OR**</div>

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

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

<div align="center">**OR**</div>

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

<div align="center">*****</div>

## CMR COLLEGE OF ENGINEERING & TECHNOLOGY
### (UGC AUTONOMOUS)
**B.Tech III Semester Supplementary Examinations August-2023**
**Course Name: DESIGN & ANALYSIS OF ALGORITHMS**
**(Common for CSC & CSD)**

| 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. | Define Theta Notation. | 2 M |
| 2. | Find the recurrence equation for the worst case behavior of Merge Sort. | 2 M |
| 3. | If $f(n) = 5n^2 + 6n + 4$, then show that $f(n)$ is $O(n^2)$. | 2 M |
| 4. | List the features of dynamic Programming. | 2 M |
| 5. | State the principles of optimality. | 2 M |
| 6. | Define state space tree. | 2 M |
| 7. | Differentiate between live node and dead node. | 2 M |
| 8. | Define branch and bound. | 2 M |
| 9. | What is non deterministic algorithm? | 2 M |
| 10. | What are different reduction techniques? | 2 M |

### PART-B
**Answer the following. Each question carries TEN Marks.**

5x10=50M

11.A). What is an algorithm? What are the properties of an algorithm? Explain with an example. 10M

**OR**

11. B). Design an algorithm for checking whether all elements in a given array are distinct or not. Derive its worst time complexity. 10M

12. A). What is divide and conquer technique? Explain any one application of divide and conquer method with an example. 10M

**OR**

12. B). Compute the optimal solution for job sequencing with deadlines using greedy method. n = 4, profits (p1, p2, p3, p4) = (100, 10, 15, 27), deadlines (d1, d2, d3, d4) = (2, 1, 2, 1). 10M

13. A). Solve the solution for 0/1 knapsack problem using dynamic programming (p1, p2, p3, p4) = (11, 21, 31, 33), (w1, w2, w3, w4) = (2, 11, 22, 15), m = 40, n = 4. 10M

**OR**

13. B). Illustrate graph coloring problem with an example. 10M

*(P.T.O..)*

14. A).  Show the shortest distance using All Pairs Shortest Path algorithm for the following    10M
graph.
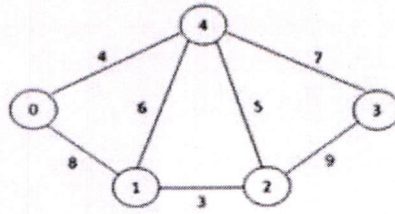


**OR**

14. B).  Discuss about Depth First Search algorithm with an example.                              10M

15. A).  Compare NP-hard and NP-complete.                                                          10M

**OR**

15. B).  Explain control abstraction for LC search.                                                10M

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# 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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**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations August-2023
Course Name: **OBJECT ORIENTED PROGRAMMING THROUGH JAVA**
**(Common for CSC, CSM, AID & AIM)**

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. What is object oriented programming?
2. List out the features of java.
3. What is Exception Handling?
4. Define inner class.
5. Distinguish multi threading and multi tasking.
6. Write a note on thread states.
7. List the methods of Random class.
8. Name types of JDBC drivers in Java.
9. Define event and list out the event sources.
10. Define delegation event model.

2 M
2 M
2 M
2 M
2 M
2 M
2 M
2 M
2 M
2 M

## PART-B
### Answer the following. Each question carries TEN Marks.

5x10=50M

11.A). What is interface? Write a program to demonstrate how interfaces can be extended.  10M

**OR**

11. B). Write a sample program to illustrate creating and importing packages.  10M

12. A). List out the benefits of exception handling mechanism in java and differentiate checked and unchecked exceptions.  10M

**OR**

12. B). Explain throws statement in Java with the help of an example program.  10M

13. A). What is the difference between byte streams and character streams? How are they used to capture input from the user?  10M

**OR**

13. B). List benefits of multithreading? How we set priority to threads. Explain with suitable program.  10M

14. A). Explain String Tokeinzer and Scanner classes with example programs.  10M

**OR**

14. B). What is an importance of JDBC? Give an example program to connect database with java?  10M

15. A). What is the significance of Layout managers? Discuss briefly any two layout managers.  10M

**OR**

15. B). Demonstrate JApplet and JPanel with example programs.  10M

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# 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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# 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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