H.T No: | | | | | | | | | | | **R18** **Course Code: A30341**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech VII Semester Regular/Supplementary Examinations December-2022

Course Name: OPERATIONS RESEARCH

(Mechanical Engineering)

Date: 06.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

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

1. Write the two applications of research models. 2 M
2. Define feasible region. 2 M
3. Write the elements of Transportation Problem. 2 M
4. What do you mean by unbalanced transportation problem? 2 M
5. Define sequencing. 2 M
6. What are the situations of replacement. 2 M
7. State dominance theory of game theory. 2 M
8. What is buffer time. 2 M
9. Write any two characteristics of queuing system. 2 M
10. What do you mean by Dynamic Programming? 2 M

PART-B

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

11.A). Use simplex method to solve LP Problem Maximize $60x_1 + 70x_2$, 10M
Subject to: $2x_1 + x_2 \leq 300$, $3x_1 + 4x_2 \leq 509$, $4x_1 + 7x_2 \leq 812$, $x_1, x_2 \geq 0$

OR

11. B). Using graphical method solve $Z=3X_1+4X_2$ Subjected to constraints: 10M
i) $X_1-X_2=-1$, ii) $-X_1-X_2 \leq 0$ and $x_1, x_2 \geq 0$

12. A). A company has three factories located in three cities viz. X, Y, Z. These factories supplies consignments to four dealers viz. A, B, C and D. The dealers are spread all over the country. The production capacity of these factories is 1000, 700 and 900 units per month respectively. The net return per unit product is given in the following table 10M

Factory	Dealers A	B	C	D	capacity
X	6	6	6	4	1000
Y	4	2	4	5	700
Z	5	6	7	8	900
Requirement	900	800	500	400	2600

Determine a suitable allocation to maximize the total return.

OR

12. B). Explain the steps of Vogel's Approximation Method (VAM) in solving the problem. 10M

(P.T.O..)

13. A). Discuss the sequencing of n jobs for three machines. 10M

OR

13. B). The cost of equipment is Rs. 62,000 and its scrap value is Rs. 2,000. The life of the equipment is 8 years. The maintenance costs for each year are as given below: 10M

YEAR	1	2	3	4	5	6	7	8
Maintenance cost Rs	1000	2000	3500	5000	8000	11000	16000	24000

In which year we have to replace the equipment?

14. A). What is meant by a two-person zero sum game? Explain with an example. 10M

OR

14. B). A manufacturer uses Rs.20, 000 worth of an item during the year. Manufacturer estimated the ordering cost as Rs.50 per order and holding costs as 12.5% of average inventory value. Find the optimal order size, number of orders per year, time period and total cost. 10M

15. A). A television repairman finds that the time spent on his jobs has an exponential distribution with a mean of 30 minutes. If he repairs the sets in the order in which they came in, and if the arrival of sets follows a Poisson distribution with an approximate average rate of 10 per 8-hour day, what is the repairman's expected idle time each day? How many jobs are ahead of the average set just brought in? 10M

OR

15. B). Use dynamic programming to solve the following LPP Max $Z= 3x_1+5x_2$ Subjected to $X_1 \leq 4$, $X_2 \leq 6$, $3x_1+2x_2 \leq 18$ and $x_1, x_2 \geq 0$ 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30163**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech VII Semester Regular/Supplementary Examinations December-2022

Course Name: AIR POLLUTION & CONTROL

(Common for EEE, MECH, ECE, CSE & IT)

Date: 08.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

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

1. Define Inversion. 2 M
2. Give any four examples for aerosols. 2 M
3. Write a note on Mixing height. 2 M
4. Discuss the terms wind direction & speed. 2 M
5. List out the difficulties encountered in sampling. 2 M
6. What is called mass spectrometric analysis? 2 M
7. Define efficiency of separating devices. 2 M
8. Write a note on dust trap. 2 M
9. Discuss exhaust emission. 2 M
10. List any four functions of state pollution control board. 2 M

PART-B

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

11.A). Explain about Primary and Secondary air pollutants. 10M

OR

11. B). Summarize the influences of hydrogen fluride & hydrogen chloride as air pollutants. 10M

12. A). Briefly explain about estimation of plume rise. 10M

OR

12. B). Elaborate secondary meteorological parameters that influence air pollution. 10M

13. A). Write a detailed note on Gaussian dispersion Models. 10M

OR

13. B). Explain about Adsorbers & Condensers– the sampling devices. 10M

14. A). Elaborate about mechanical scrubbers. 10M

OR

14. B). Summarize about Electrostatic Precipitator. 10M

15. A). Explain the significance of air pollution control area. 10M

OR

15. B). Brief about Environmental (Protection) Act 1986. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30353**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech VII Semester Regular/Supplementary Examinations December-2022

Course Name: MICRO MACHINING PROCESSES

(Mechanical Engineering)

Date: 10.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

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

1.	What is meant by MMP?	2 M
2.	Write the principle of abrasive jet micro machining.	2 M
3.	What is chemo mechanical polishing?	2 M
4.	What are the features of abrasive flow finishing?	2 M
5.	Describe the wire cut electro discharge machining process.	2 M
6.	Write the advantages and limitations of EDDM.	2 M
7.	Define the chemical Energy based micro material machining process.	2 M
8.	Write the advantages and limitations of ECMM.	2 M
9.	What is Micro Milling?	2 M
10.	What is meant by micro turning?	2 M

PART-B

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

11.A).	What are the classification of micro milling process and difference with conventional machining?	10M
	OR	
11. B).	Explain the working principle, elements and characteristics of USMM process.	10M
12. A).	Explain the process parameters in MFP process, List its application and limitations.	10M
	OR	
12. B).	Explain about the MRAFF process with neat sketch and list its application and limitations.	10M
13. A).	Briefly Discuss about the EBMM, List its application and limitations.	10M
	OR	
13. B).	Differentiate between the EDDG and ELID with respect to their process parameters.	10M
14. A).	Explain the principles of electrochemical micro deburring process.	10M
	OR	
14. B).	Identify the specific advantages of chemical machining process over an electrochemical machining process and mention the practical application of chemical machining?	10M
15. A).	Classify the common traditional methods. Give a list of such operations.	10M
	OR	
15. B).	Explain the working principle of focused ion beam machining with neat sketch.	10M

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H.T No: | | | | | | | | | | | R18 | Course Code: A30374

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VII Semester Regular/Supplementary Examinations December-2022

Course Name: NON CONVENTIONAL SOURCES OF ENERGY

(Mechanical Engineering)

Date: 13.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

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

1. List out the advantages of renewable energy sources. 2 M
2. Classify types of non-conventional sources energy. 2 M
3. Define solar radiation and solar irradiance. 2 M
4. List out the applications of solar PV cell. 2 M
5. What are the main considerations in selecting a site for wind generators? 2 M
6. List the merits and demerits of wind energy. 2 M
7. What are the classifications of geo thermal sources? 2 M
8. List out various types of Chulhas for rural energy. 2 M
9. What are the limitations of Wave energy conversion? 2 M
10. What are the environmental impacts of OTEC system? 2 M

PART-B

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

11.A). Compare different non-conventional energy resources and conventional energy resources. 10M

OR

11. B). Explain conventional and non-conventional Energy with Examples. 10M

12. A). Explain the main components of a flat – plate Solar collector with a neat diagram. 10M

OR

12. B). Explain with a neat sketch the working principle of standalone and grid Connected solar system. 10M

13. A). Discuss the working of Horizontal axis wind turbine with neat diagram. 10M

OR

13. B). Explain working principle of induction type generators. 10M

14. A). Explain with neat sketch, the operation of a geothermal power plant. 10M

OR

14. B). What is the difference between biomass and biogas? And how does bio mass conversion takes place? 10M

15. A). Discuss the salient features of different types of ocean thermal energy conversion systems for power generation. 10M

OR

15. B). List out differences between tidal and wave power generation. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30355**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech VII Semester Regular/Supplementary Examinations December-2022

Course Name: SURFACE ENGINEERING

(Mechanical Engineering)

Date: 15.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

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

1. Write the surface engineering with its area of activity. 2 M
2. Outline the various surface preparation methods. 2 M
3. Classify the materials used for metallic and non-metallic coatings. 2 M
4. How the important physio-chemical parameters affect coatings? 2 M
5. What difference exists between the principals in PVD and CVD? 2 M
6. What methods for the testing and evaluation of metallic coatings are significant? 2 M
7. State the important characteristics of the major thermal spray processes. 2 M
8. Outline the five different commercially available thermal spray methods. 2 M
9. How would you explain the concept of diffusion coating? 2 M
10. How is nitriding and carbonitriding surface differ from each other? 2 M

PART-B

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

11.A). What are the various types of surface preparation and their manufacturing techniques? Explain any one with neat sketch. 10M

OR

11. B). What are the four degreasing systems? Brief any one of the principal systems under vapor degreasing technique? 10M

12. A). What are the three principal types of phosphate coatings? Suggest the suitable method most viable for preparing sliding component? 10M

OR

12. B). How would you apply any of the electrochemical and chemical techniques in order to deposit a metallic coating on material? 10M

13. A). How would you compare the various PVD techniques? Explain any one with neat sketch. 10M

OR

13. B). How would you apply the Laser-Induced Chemical Vapour Deposition technique on materials? 10M

14. A). Discuss the uses of thermal spray coatings and explain any one method with neat sketch. 10M

OR

14. B). Evaluate high velocity oxyfuel (HVOF) technique with schematic. 10M

15. A). What do you think about different carburizing methods? Describe any one method with neat sketch. 10M

OR

15. B). Elaborate the principles of diffusion coating. Explain any one with involved chemical reactions. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30555**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VII Semester Regular/Supplementary Examinations December-2022

Course Name: INTRODUCTION DATABASE MANAGEMENT SYSTEMS

(Common for MECH, EEE & ECE)

Date: 17.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

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

1.	What is JOIN operation and mention their types?	2 M
2.	What is Data Abstraction in DBMS?	2 M
3.	List the various data types supported by SQL.	2 M
4.	What are the advantages and disadvantages of views in a database?	2 M
5.	Distinguish between EXISTS and NOT EXISTS.	2 M
6.	Explain about any two SQL Aggregate Functions.	2 M
7.	What is Exception and write the types?	2 M
8.	What are Packages?	2 M
9.	Explain about functional dependency.	2 M
10.	What are the various update anomalies that can arise in a relational database?	2 M

PART-B

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

11.A). With a neat diagram describe the overall system structure of DBMS. 10M

OR

11. B). What are the basic operations used in relational algebra? Explain with examples. 10M

12. A). What is the use of constraints? What are the different types of constraints that can be specified? Explain with examples. 10M

OR

12. B). Explain the following commands with examples:
i) Alter Table, ii) Drop Table, iii) Truncate & iv) Create 10M

13. A). Give syntax for DML commands? Show their operations with an example. 10M

OR

13. B). What is a Query? Consider the following database schema to write queries in SQL 10M
Supplier (id, name, city)
Parts (pno, pname, pdescription)
Supply (id, pno, cost)
i) Find the names of the parts supplied by "Kumar"
ii) Find the names of the suppliers who supply "Nuts"
iii) Find the cost of bolts being supplied by Mumbai suppliers.

(P.T.O..)

14. A). What is a Cursor? Explain the types of Cursors with suitable example(s)? 10M

OR

14. B). What is a Function? Write its syntax and example function to calculate factorial of a given number. 10M

15. A). What is normalization? Explain 1NF, 2NF and 3NF with example for each. 10M

OR

15. B). What do you mean by decomposition of a relation? Why is it required? Discuss the three desirable properties of decomposition. 10M

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H.T No: | | | | | | | | | | | R18 | Course Code: A30554

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech VII Semester Regular/Supplementary Examinations December-2022

Course Name: JAVA PROGRAMMING

(Common for MECH, EEE & ECE)

Date: 17.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

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

1.	List out Java Essentials.	2 M
2.	Simplify Type conversion.	2 M
3.	Illustrate the Command Line Arguments.	2 M
4.	What are the uses of Super keyword?	2 M
5.	Summarize the Wrapper class.	2 M
6.	List of Exception handling techniques.	2 M
7.	Define daemon thread.	2 M
8.	What is Synchronization?	2 M
9.	Elaborate the Scanner class.	2 M
10.	How to use BufferedInputStream class?	2 M

PART-B

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

11.A).	Briefly explain the features of java. Make a Java program that determines whether a given integer is even or odd.	10M
	OR	
11. B).	Define Constructor. Discuss the various types of constructors in java programming.	10M
12. A).	What are the different types of inheritance? Give an example to illustrate how to utilise the Super keyword in inheritance.	10M
	OR	
12. B).	Write examples of various array types. Create a Java program to determine multiplication of two matrices.	10M
13. A).	Classify the String and StringBuffer classes. Explain methods of String class with suitable example program.	10M
	OR	
13. B).	What is exception handling? How multiple exceptions are caught? Write a java program to demonstrate the use of user defined exception.	10M
14. A).	Explain the thread priorities. Demonstrate with the help of example that how we set priorities in threads.	10M
	OR	
14. B).	Define a Thread. Describe the thread's life cycle with a neat diagram.	10M

(P.T.O..)

15. A). Write a Java program that will read records from the file and copy one file to another file. 10M

OR

15. B). Write short notes on:

i) FileInputStream 5M

ii) FileOutputStream 5M

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

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech VII Semester Regular/Supplementary Examinations December-2022

Course Name: PYTHON PROGRAMMING

(Common for CIVIL, EEE, MECH, ECE & CSE)

Date: 17.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

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

1. What is indentation? 2 M
2. What operators does python support? 2 M
3. What is Chained Conditional statement? Give Example. 2 M
4. Point out the difference between recursive and iterative technique. 2 M
5. Describe List Slicing with example. 2 M
6. How a tuple is iterated? Explain with an example? 2 M
7. How can you copy an object in Python? Illustrate with an example? 2 M
8. How will you check if a class is a child of another class? 2 M
9. Compare Terminal-based user interfaces and GUIs. 2 M
10. How to create Label Widget in Python? 2 M

PART-B

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

11.A). Summarize various operators, built-in functions and standard library modules that deals with Python's numeric type. 10M

OR

11. B). What is the purpose of else clause for a loop? Explain how else works with while and for loops, with examples. 10M

12. A). Explain about different types of arguments in Python. Write a function to generate cubes of numbers over time. 10M

OR

12. B). Explain the file built-in functions and methods with clear syntax, description and illustration. 10M

13. A). i) Demonstrate how to create and print a 3-dimensional matrix with lists. 5M

ii) Write a Python program that counts the number of occurrences of a letter in a string, using dictionaries. 5M

OR

13. B). Give a comparison between lists, tuples, dictionaries and sets. 10M

(P.T.O..)

14. A). Explain how to implement different types of inheritance in Python with example. 10M

OR

14. B). Describe how the arithmetic operators can be overloaded to work with a new class of numbers. 10M

15. A). Develop a Python program that creates a GUI with a textbox, Ok button and Quit button. On clicking Ok, the text entered in textbox is to be printed in Python shell; on clicking Quit, the program should terminate. 10M

OR

15. B). Explain the Turtle Graphics Basic commands and drawing different shapes on screen with example. 10M

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H.T No: | | | | | | | | | | | R18 | Course Code: A30160

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VII Semester Regular/Supplementary Examinations December-2022

Course Name: DISASTER MANAGEMENT & MITIGATION

(Common for EEE, MECH, ECE, CSE & IT)

Date: 17.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

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

1.	Define environmental hazard.	2 M
2.	Mention about the approaches related to human ecology.	2 M
3.	Give examples of Man induced hazards.	2 M
4.	Differentiate Endogenous and Exogenous hazards.	2 M
5.	State the hazardous effects of volcanoes.	2 M
6.	Draw different forms of lightning.	2 M
7.	List out the monitoring systems used for tracing the path of cyclones	2 M
8.	Identify the Flood hazard status in India	2 M
9.	Define the term Rehabilitation.	2 M
10.	Write a short note on an emergency stage in disaster management.	2 M

PART-B

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

11.A).	i) Distinguish between Environmental stress, hazard and disaster.	5M
	ii) Describe Ecosystem approach to mitigate environmental stress. In what way it is different from the perception approach?	5M
	OR	
11. B).	Human perception changes with environmental degradation. Justify the statement.	10M
12. A).	Explain how man-made hazards trigger the natural hazards	10M
	OR	
12. B).	Explain different types of Endogenous hazards.	10M
13. A).	Summarize about volcanic eruptions impacts on environment	10M
	OR	
13. B).	Explain the reason behind Zones of earthquake occurrence in India. List out various hazardous effects of earthquakes.	10M
14. A).	i) Mention the causes of drought and the mitigation measures.	5M
	ii) Explain the relation between environmental hazard and ecology with respect to drought.	5M
	OR	
14. B).	State the factors influencing the soil erosion along with different methods of conservation measures.	10M

(P.T.O..)

15. A). i) Illustrate the considerations related to the disaster management of human resources during the COVID-19 pandemic. 5M

ii) Write few implementations required in such emergency situations with disaster response team 5M

OR

15. B). Differentiate rescue and preparedness. Explain pre disaster measures that would have reduced the impact of land slide disaster. 10M

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