H.T No: | | | | | | | | | | | R22

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

Examination	:	**M.Tech III Semester Supplementary Examinations July-2025**
Course Name	:	**Rehabilitation and Retrofitting of Structures**
Course Code	:	**B420415**
Branch	:	**Structural Engineering**
Date & Session	:	**03-07-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Distinguish between physical and chemical causes of deterioration. 1 M
2. Justify the use of non-destructive evaluation techniques for assessing post-earthquake damage. 1 M
3. State any two effects of temperature on the durability of concrete. 1 M
4. What is the role of cover thickness in preventing corrosion? 1 M
5. Name any two symptoms of structural distress. 1 M
6. Mention any one application of external post-tensioning in retrofitting. 1 M
7. State any two differences between guniting and shotcrete. 1 M
8. Mention any two challenges in repairing underwater concrete structures. 1 M
9. Define vacuum concrete and state one of its benefits 1 M
10. What is the purpose of rust eliminators in repair? 1 M

PART-B

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

11.A). Explain various causes of distress in reinforced concrete structures. 10M

OR

11. B). How does quality control during construction help reduce long-term structural distress? Suggest ways to improve current practices. 10M

12. A). Outline a damage assessment procedure for a fire-damaged commercial building, including crack evaluation and suitable test methods. 10M

OR

12. B). Compare the destructive, semi-destructive, and non-destructive testing methods used in structural damage evaluation. 10M

13. A). Analyze the various retrofitting techniques used for structural elements and compare their applications and limitations. 10M

OR

13. B). Discuss the role of damage assessment and non-destructive testing in determining the need and method of retrofitting in aging infrastructure. 10M

(P.T.O.)

14. A). Compare various strengthening and retrofitting techniques, when is each method preferred? 10M

OR

14. B). Assess the application of underpinning techniques in stabilizing foundations of distressed buildings. 10M

15. A). Propose a sensor-based health monitoring system for a high-rise building, covering sensor placement, data collection, and analysis. 10M

OR

15. B). Evaluate the use of epoxy resins, special mortars, and concrete chemicals in concrete repairs. When and why are they used? 10M

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Examination	:	**M.Tech III Semester Supplementary Examinations July-2025**
Course Name	:	**Digital Forensics**
Course Code	:	**B458413**
Branch	:	**Computer Science & Engineering**
Date & Session	:	**03-07-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	Define digital forensics.	1 M
2.	What is the role of criminalistics in cyber-forensics?	1 M
3.	List two court orders required for seizing electronic evidence.	1 M
4.	Name one method used to search for electronic evidence.	1 M
5.	Define the workload of law enforcement.	1 M
6.	Identify one importance of the forensic mindset.	1 M
7.	Name one open-source tool used for network forensic analysis.	1 M
8.	What is the purpose of a computer forensics workstation?	1 M
9.	State one mobile forensics technique.	1 M
10.	Which section of the IT Act 2000 addresses digital evidence?	1 M

PART-B

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

11.A).	Explain the holistic approach to cyber-forensics, including its key components and their significance in digital investigations.	10M
	OR	
11. B).	Compare and contrast computer forensics with traditional forensics, highlighting their scope and challenges in investigating digital crimes.	10M
12. A).	Outline the process of searching and seizing electronic evidence, including the legal considerations involved.	10M
	OR	
12. B).	Analyze the role of court orders in cybercrime investigations, including the types of documents required and their legal implications.	10M
13. A).	Discuss the steps involved in creating and managing shared folders for evidence management using an operating system, emphasizing the forensic mindset.	10M
	OR	
13. B).	Evaluate the importance of probable cause in evidence gathering and its impact on the admissibility of evidence in court.	10M

(P.T.O..)

14. A). Describe the process of conducting a computer forensic investigation, including the role of forensic workstations and software. 10M

OR

14. B). Critique the effectiveness of open-source security tools in network forensic analysis, providing examples of tools and their applications. 10M

15. A). Summarize the key provisions of the IT Act 2000 and its 2008 amendment relevant to digital forensics. 10M

OR

15. B). Design a comprehensive mobile forensics investigation plan, including techniques, tools, and legal considerations for seizing electronic evidence. 10M

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Examination : **M.Tech III Semester Supplementary Examinations July-2025**
Course Name : **Optimization Techniques**
Course Code : **B458601**
Branch : **SE/ CSE**
Date & Session : **05-07-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Define the term optimization. 1 M
2. Classify various optimization problems. 1 M
3. Write formula for VAM method 1 M
4. Classify Transportation Problems 1 M
5. What is interpolation? 1 M
6. State the Limitations of Fibonacci Method. 1 M
7. Write about Uni variant method 1 M
8. What do you understand by the term 'penalty'? 1 M
9. Write about BELLMANS Principle of Optimality. 1 M
10. Write any two applications of dynamic programming. 1 M

PART-B

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

11.A). Solve the following LPP by Graphical Method 10M

Minimize Z = $20 X_1 + 10 X_2$

Subject to Constraints : $X_1 + 2X_2 \leq 40$

$3X_1 + X_2 \geq 30$

$4X_1 + 3X_2 \geq 60$

Non –Negativity : $X_1 X_2 \geq 0$

OR

11. B). Classify various types of Optimization Problems in detail. 10M

12. A). Find the Initial Basic Feasible Solution of the following transportation problem by WC Method. 10M

Source		Destination				
		D1	D2	D3	D4	Availability
	O1	1	2	1	4	30
	O2	3	3	2	1	50
	O3	4	2	5	9	20
	Demand	20	40	30	10	

(P.T.O..)

OR

12. B). There are 5 jobs to be done on 5 available machines. The following matrix shows the return in rupees on assigning various jobs to different machines. Determine as Assignment which maximizes the total return 10M

	M_1	M_2	M_3	M_4	M_5
J1	5	11	10	12	4
J2	2	4	6	3	5
J3	3	12	5	14	6
J4	6	14	4	11	7
J5	7	9	8	12	5

13. A). Minimize $f(x) = .65 - \left(\frac{.75}{1+x^2}\right) - .65 \times \tan^{-1}\left(\frac{1}{x}\right)$ in the interval [0,3] by the Fibonacci method using n = 6. 10M

OR

13. B). Solve the following **non-LPP** by Lagrangian Multiplier method. 10M

Min Z = $4x_1^2 + 2x_2^2 + x_3^2 - 4x_1 x_2$

STC: $x_1 + x_2 + x_3 = 15$

$2x_1 - x_2 + 2x_3 = 20$

$x_1 x_2 x_3 \geq 0$

14. A). Max $f(x) = x_1^2 - x_1x_2 + 3x_2^2$. Use univariant method by taking starting point as (1,2). Show Calculations for only two cycles. 10M

OR

14. B). Min Z: $x_1^2 + x_2^2 + x_3^2$ 10M

Such that $x_1+2x_2+3x_3 = 7$

$2x_1+2x_2+x_3 = 4.5$ using penalty function method.

15. A). Explain the multistage decision process with suitable examples. 10M

OR

15. B). An employee located at city A is transferred to city I. He gets reimbursement of his travel expenditures on the shortest route. The possible alternative routes and the distances between any two cities are given in Table. Determine the shortest route that the employee must travel. Also, find the shortest routes from various cities to city I. 10M

From city	To city	Corresponding distance in km
A	B, C	4, 3
B	D, E, F	5, 3, 7
C	D, E, F	6, 2, 4
D	G, H	6, 4
E	G, H	3, 5
F	G, H	7, 6
G	I	6
H	I	5

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