

Hall Ticket Number :

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R-19

Code: 19B122T

M.Tech. II Semester Regular & Supplementary Examinations November 2022

Analysis of Shells and Folded Plates

(Structural Engineering)

Max. Marks: 60

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5 x 12 = 60Marks)

Marks CO Blooms Level

UNIT-I

- | | | | |
|---|----|-----|-----|
| 1. a) How membrane theory is applied to cylindrical shells. | 8M | CO5 | BL1 |
| b) Write the merits of membrane theory. | 4M | CO5 | BL2 |

OR

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|---|-----|-----|-----|
| 2. Draw the flow chart of Indian standard classification of shell structures. | 12M | CO1 | BL4 |
|---|-----|-----|-----|

UNIT-II

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|---|-----|-----|-----|
| 3. Differentiate between the approximate theory and exact theory. | 12M | CO4 | BL2 |
|---|-----|-----|-----|

OR

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|--|----|-----|-----|
| 4. a) State the assumptions of schorers theory. | 4M | CO4 | BL1 |
| b) Derive the schorers eigh order differential equation. | 8M | CO4 | BL6 |

UNIT-III

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|---|-----|-----|-----|
| 5. Derive the stress function for a shell of double curvature other than surface of revolution. | 12M | CO5 | BL6 |
|---|-----|-----|-----|

OR

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|---|----|-----|-----|
| 6. a) Mention the application of membrane theory of synclastic shell i.e., elliptic paraboloid. | 8M | CO5 | BL2 |
| b) Explain how a elliptic paraboloid is formed | 4M | CO5 | BL2 |

UNIT-IV

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|---|-----|-----|-----|
| 7. Mention the historical background for the formation of folded plate. | 12M | CO3 | BL2 |
|---|-----|-----|-----|

OR

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|---|-----|-----|-----|
| 8. Mention the advantages of the folded plate method of analysis over the classical method of cylindrical shell analysis. | 12M | CO4 | BL2 |
|---|-----|-----|-----|

UNIT-V

- | | | | |
|--|-----|-----|-----|
| 9. Derive the equation of equilibrium for a shell with double curvature subjected to shells of revolution. | 12M | CO6 | BL6 |
|--|-----|-----|-----|

OR

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|---|----|-----|-----|
| 10. a) Derive the stresses in spherical shell under own weight acts over the horizontal projection. | 8M | CO6 | BL6 |
| b) Draw the figure representing self-weight on spherical shell. | 4M | CO6 | BL4 |

END

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R-19

Code: 19B12DT

M.Tech. II Semester Regular & Supplementary Examinations November 2022

Design of Form Work
(Structural Engineering)

Max. Marks: 60

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5 x 12 = 60Marks)

	Marks	CO	BL
UNIT-I			
1. a) Why steel formwork is more preferred? What are the advantages of steel formwork over timber formwork?	6M	CO1	L1
b) Describe in your own words the use of plywood as a form face material	6M	CO1	L2
OR			
2. a) What properties of aluminum make it good choice for a form face material?	6M	CO1	L1
b) What is the importance of formwork? Describe the steps to be followed to affect the economy in the cost of formwork?	6M	CO1	L1
UNIT-II			
3. Design the formwork for the beam and slab floor, for the following data			
1. Thickness of floor =120mm			
2. Centre to Center spacing of beams =3m			
3. Width of beam= 300mm and depth 400mm below slab			
4. Height of ceiling of the roof = 4m above the floor			
Take live load on sheathing equal to 4000N/M ² and dead weight of wet concrete as 26500N/M ³	12M	CO2	L3
OR			
4. a) Explain in details various Loads acting on formwork.	6M	CO2	L3
b) Explain with neat sketches the formwork for RCC Column.	6M	CO2	L2
UNIT-III			
5. Design the formwork for Overhead tanks? Explain effect of wind load on formwork.	12M	CO3	L3
OR			
6. How is formwork designed for			
a. Domes b. Folded Plates c. Natural Draft Cooling Tower	12M	CO3	L3
UNIT-IV			
7. a) What are the advantages of slip forms?	6M	CO4	L1
b) Write short notes on Formwork Management issues	6M	CO4	L1
OR			
8. Explain the terms with suitable figures,			
a. Table formwork b. Tunnel formwork c. Slip formwork	12M	CO4	L2
UNIT-V			
9. a) Discuss the causes of failures of formwork.	6M	CO5	L2
b) Mention the general rules to be observed to avoid the failure of formwork.	6M	CO5	L2
OR			
10. Explain various problems occur in formwork of multi-storey building construction.	12M	CO5	L2

END

Code: 19B121T

M.Tech. II Semester Regular & Supplementary Examinations November 2022

Structural Dynamics

(Structural Engineering)

Max. Marks: 60

Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1. a) Explain about free vibration and forced vibration. 6M
- b) A dynamics system has maximum velocity of 200 mm/s and the natural period is 1s. If the initial displacement is 10 mm, determine the amplitude, the initial velocity and the maximum acceleration. 6M

OR

2. a) Explain about methods of discretization. 6M
- b) A one kg mass is suspended by a spring having a stiffness of 1N/mm. Determine the natural frequency and static deflection of the spring. 6M

UNIT-II

3. a) What are the fundamental objectives of dynamic analysis? 6M
- b) Derive expression for "Dynamic magnification factor" and "phase angle" considering a damping SDOF system subjected to a dynamic load $p(t)=p_0 \sin \omega t$. Sketch their variation with frequency ratio. 6M

OR

4. Discuss the response of an undamped SDOF system subjected to half-sin impulsive loading. 12M

UNIT-III

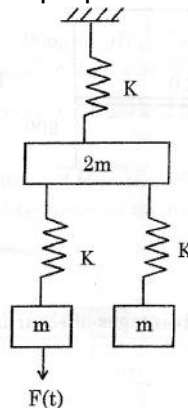
5. a) Derive an equation of free un damped vibration analysis of MDOF systems. 6M
- b) Explain about Eigen value and Eigen vector is MDOF systems. 6M

OR

6. Determine the natural frequencies and mode shapes of the given MDOF system. $EI=4.5 * 10^6$ N-m² for all columns. 12M

UNIT-IV

7. Determine the amplitude of motion of three masses shown in fig.3 when a harmonic force $F(t) = F_0 \sin \omega t$ is applied. Take $m=1.5\text{kg}$ $K= 1500\text{N/m}$ $F_0 = 10\text{N}$ $\omega = 10$ rad/s. Use mode superposition method.



12M

OR

8. Determine the first two frequency by Rayleigh-ritz method, assuming

$$[\bar{w}] = \begin{Bmatrix} 1 & 1 \\ 0.8 & -0.8 \\ 0.4 & -1.2 \end{Bmatrix} \quad [K] = \begin{Bmatrix} 2k & -2k & 0 \\ -2k & 4k & -2k \\ 0 & -2k & 5k \end{Bmatrix} \quad [M] = \begin{Bmatrix} m & 0 & 0 \\ 0 & m & 0 \\ 0 & 0 & m \end{Bmatrix} \quad 12M$$

UNIT-V

9. Determine the frequencies of flexural vibrations of beams with both ends fixed. 12M

OR

10. Explain in detail about the steps involved in Earthquake resistant design of structures as per IS code. 12M

END

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R-19

Code: 19B12ET

M.Tech. II Semester Regular & Supplementary Examinations November 2022

Advanced Concrete Technology

(Structural Engineering)

Max. Marks: 60

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 12 = 60 Marks)

	Marks	CO	Blooms Level
UNIT-I			
1. a) Describe in detail about hydration process of calcium hydroxide	6M	1	2
b) Explain in detail about high alumina cement	6M	1	2
OR			
2. a) Outline different types of cements and its applications	6M	1	1
b) Explain in detail about high-density aggregates			
UNIT-II			
3. Explain chemical and mineral admixtures of in view of strength and durability	12M	2	2
OR			
4. Explain the process of manufacturing different types of concretes	12M	2	2
UNIT-III			
5. Explain the mechanical and durability properties of HPC	12M	3	2
OR			
6. a) Define high strength, and super high strength concrete	4M	3	1
b) Explain the principles for production of UHPC	8M	3	2
UNIT-IV			
7. A client approached you to conduct the condition assessment of his building which is of 25 years old and he wants to know the reserve strength of concrete. Explain the step-by-step procedure	12M	4	4
OR			
8. a) Explain the rebound hammer test in detail	6M	4	2
b) Explain the procedure for evaluating the corrosion of reinforcement	6M	4	2
UNIT-V			
9. a) Why we need to calculate the lateral pressure of concrete in design of formwork	6M	5	2
b) Explain the design concept for formwork for slab	6M	5	2
OR			
10. Explain in detail about flying formwork for a high-rise building and also explain in detail about economic aspects of in in comparison with traditional formwork	12M	5	2

END