Hall Ticket Number :										

R-19

Code: 19B121T

M.Tech. II Semester Regular Examinations November 2020

Structural Dynamics

(Structural Engineering)

Max. Marks: 60 Time: 3 Hours

Answer *any five* questions from the following (5 x 12 = 60 Marks)

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			Marks	CO	Blooms Level
1.		Derive equation of motion for a freely vibrating undamped SDOF system and obtain its solutions.	12M		
2.	a)	Define the following terms: i) Amplitude ii) Damping iii) Resonance	03M		
	b)	Define logarithmic decrement and derive an expression for logarithmic decrements	09M		
3.	a)	Derive the expression for Duhamel's integral for the response of SDOF system subjected to arbitrary excitation.	06M		
	b)	An SDOF system consists of a mass of 20kg, a spring of stiffness 2200N/m and a dashpot with a damping coefficient of 60 NS/m is subjected to a harmonic excitation of F=200sin5t. write the complete solution of the equation of the equation of motion	06M		
4.		Derive an equation of motion for a damped harmonic excitation of a SDOF vibrating system and obtain its complete solution.	12M		
5.		Determine the natural frequencies and mode shapes for the structure as shown in Fig.1.			

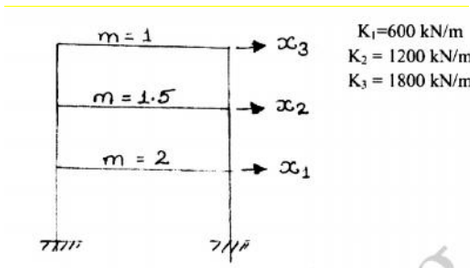

Fig 1 12M

6.		Calculate the natural frequency and mode shape by stodola method for the given below m1=m2=m3=2, K1=K, K2=2K, K3=3K			

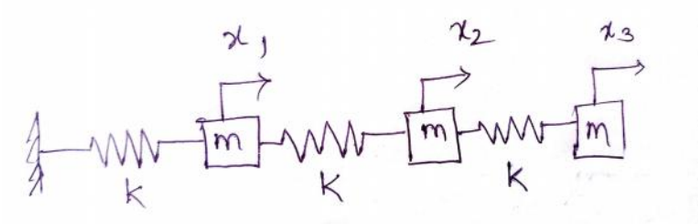

Fig2 12M

7.		By using Holzer method, find the natural frequencies of the system in fig3: assume K=2 N/m; m=2 kg.			

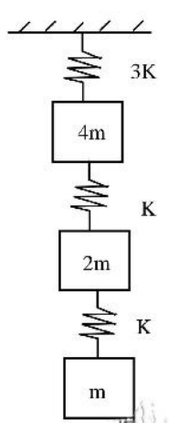

Fig 3 12M

8.		Derive equations of motion for Multi degree of freedom (MDOF) system subjected to earthquake excitation.	12M		

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Hall Ticket Number :										

R-17

Code: 19B12ET

M.Tech. II Semester Regular Examinations November 2020

Advanced Concrete Technology

(Structural Engineering)

Max. Marks: 60 Time: 3 Hours

Answer *any five* questions from the following (5 x 12 = 60 Marks)

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			Marks
1.	a)	Explain the hydration process of Bogues compounds and highlight the one which contributes to the strength.	6M
	b)	Why is the size gradation of aggregates important in making concrete? Explain.	6M
2.	a)	Mention the important properties of air entraining cement, masonry cement and oil well cement.	6M
	b)	Discuss about the significant property of aggregates to be used for making light weight concrete and abrasion resistant concrete.	6M
3.		Illustrate the effects of water reducing agents on properties of concrete in its fresh and hardened state.	12M
4.		Discuss the mechanical and durability properties achieved using HSC and Super HSC.	12M
5.		Differentiate between HPC and Ultra -HPC in terms of raw materials used, strength and practical applications.	12M
6.		A private agency approached you to conduct the condition assessment of a recently built flyover since there is a dispute about the quality issues like low quantity and quality of materials used, not properly cured etc., raised by another agency. What are the ways in which you will carry the assessment with NDT methods?	12M
7.		Discuss in detail about why durability is a concern now a day? And methods to achieve the same in concrete.	12M
8.		Explain the salient features of centering, scaffolding, shoring and shuttering.	12M

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Hall Ticket Number :										

R-19

Code: 19B122T

M.Tech. II Semester Regular Examinations November 2020

Analysis of Shells & Folded Plates

(Structural Engineering)

Max. Marks: 60 Time: 3 Hours

Answer *any five* questions from the following (5 x 12 = 60 Marks)

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1. Define Shell. Explain about its component parts and classification with neat figures. 12M

2. Derive the equations of equilibrium of membrane theory for cylindrical shells. 12M

3. Derive the DKJ characteristic equation for bending the theory of shells. 12M

4. Derive the governing differential equation for the membrane analysis of shells of double curvature. 12M

5. Derive the membrane differential equation for elliptic paraboloid. 12M

6. a) What are the basic assumptions considered in the analysis of the folded plates? 4M
   b) Explain the plate and slab action of folded plates. 4M
   c) Write about the three-edge shear equation for folded plates. 4M

7. Derive the equilibrium equation for spherical shell. 12M

8. Explain the detailed procedure for the analysis of folded plates by Simpson's method. 12M

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Hall Ticket Number :										

R-19

Code: 19B12AT

M.Tech. II Semester Regular Examinations November 2020

Finite Element Analysis of Structures

(Structural Engineering)

Max. Marks: 60 Time: 3 Hours

Answer *any five* questions from the following (5 x 12 = 60 Marks)

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1.	a)	Explain the basic steps involved in FEM	6M
	b)	Differentiate between Merits and Demerits of FEM	6M
2.	a)	Bring out the differences between continuum methods and FEM	6M
	b)	Using the Rayleigh - Ritz method determine maximum deflection for cantilever beam subjected to UDL and concentrated load at end of beam.	6M
3.		Determine the element stiffness matrix for a beam element?	12M
4.		What are different types of elements used for plane stress and plane strain problems in FEM	12M
5.		Determine the shape function for a triangular element by Area co-ordinate method? Explain natural co-ordinate system?	12M
6.	a)	Explain the Lagrange and Serendipity elements.	6M
	b)	Derive shape function for quadratic bar element using Lagrange interpolation function.	6M
7.		Find out the Shape function for Axi-symmetric Triangular element?	12M
8.		Determine the strain-displacement relation for hexahedral element?	12M

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