VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF CIVIL ENGINEERING

QUESTION BANK

VII SEMESTER

CE6701 -STRUCTURAL DYNAMICS AND EARTHQUAKE ENGINEERING

Regulation – 2013

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SUBJECT : CE6701 / STRUCTURAL DYNAMICS AND EARTHQUAKE ENGINEERING

SEM / YEAR: VII/IV

UNIT I - THEORY OF VIBRATIONS
Difference between static loading and dynamic loading – Degree of freedom – idealisation of structure as single degree of freedom system – Formulation of Equations of motion of SDOF system - D"Alemberts principles – effect of damping – free and forced vibration of damped and undamped structures – Response to harmonic and periodic forces.

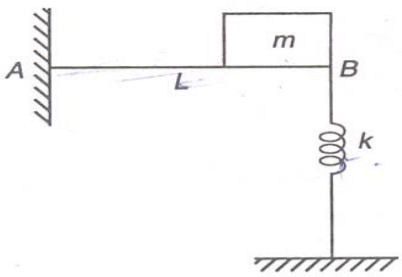
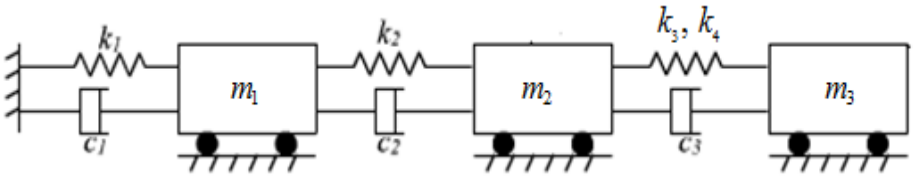
PART - A

Q.No	Questions	BT Level	Competence
1.	What is mean by theory of vibration?	BT-1	Remember
2.	Outline D-Alembert's principle of dynamic equilibrium.	BT-2	Understand
3.	Define logarithmic decrement method.	BT-1	Remember
4.	Classify the types of vibration.	BT-2	Understand
5.	Name critical damping.	BT-1	Remember
6.	Compare Viscous damping with negative damping.	BT-2	Understand
7.	Develop the Equivalent Stiffness of a Cantilever Beam a point load at free end.	BT-3	Application
8.	What does Duhamal's integral represent?	BT-1	Remember
9.	What do you understand by determinist analysis?	BT-1	Remember
10.	Select magnification factor.	BT-3	Application
11.	Discover Degrees of freedom and list the types.	BT-4	Analyse
12.	Identify harmonic and periodic loading.	BT-3	Application
13.	Examine the mathematical equation for equivalent stiffness for springs in parallel and springs in series.	BT-4	Analyse
14.	Simplify resonance and natural frequency.	BT-4	Analyse
15.	Opinion about transient vibration and earthquake excitation.	BT-5	Evaluate
16.	Create short note on amplitude.	BT-6	Create
17.	What is meant by frequency response curve for damped system?	BT-1	Remember
18.	Explain frequency ratio.	BT-2	Understand
19.	Formulate simple Harmonic motion.	BT-6	Create
20.	Compare static and dynamic loading.	BT-5	Evaluate

Q.No	PART - B Questions	BT Level	Competence
1.	A damped free vibration test is conducted to determine the dynamic properties of a one story building. The mass of the building is 100000 kg initial displacement of the building is 0.702 cm. Maximum displacements on the first cycle is 0.53cm and period of this displacement cycle is 1.7s. Estimate the Undamped frequency, effective weight, Logarithmic	BT-6	Create

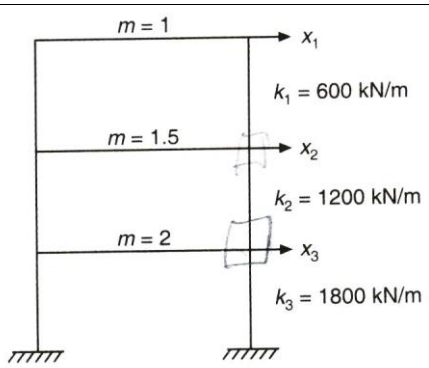
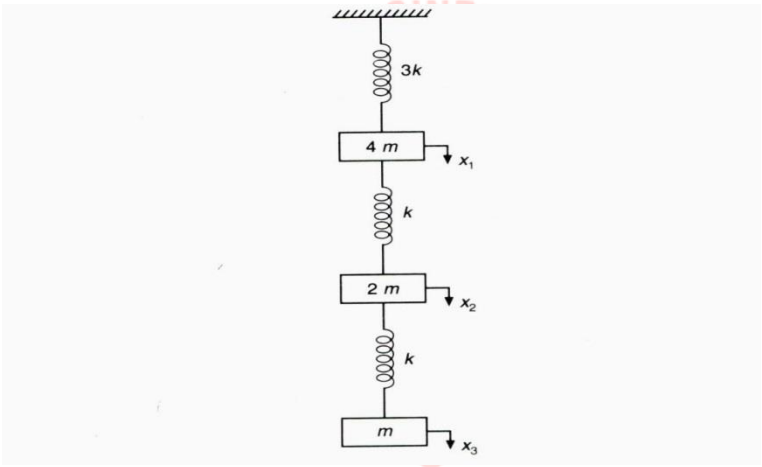
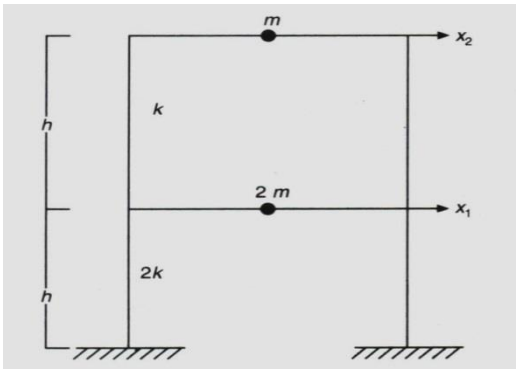
	decrement, damping ratio, damping coefficient, Damped frequency and the amplitude after 6 cycles.		
2.	Develop the equation of motion for viscous damping.	BT-3	Application
3.	A machine foundation weighs 60 KN. The spring constant is 11000KN/m and dash pot constant (C) = 200 KN-s/m. Explain i) Whether the system is over damped, under damped or critically damped. ii) Determine Logarithmic decrement iii) Determine Ratio of two successive amplitudes If the initial displacement is 10mm and initial velocity is zero displacement at t = 0.1s	BT-2	Understand
4.	A single degree of freedom system having a mass of 2.5m is set into motion with a viscous damping and allowed to oscillate freely. The frequency of oscillation is found to be 20 Hz, and measure of the amplitude of vibration shows two successive amplitude to be 6mm and 5.5mm. Estimate the viscous damping co-efficient.	BT-5	Evaluate
5.	A vibrating system consists of a mass of 5kg, spring of stiffness 120 N/m and a damper with a damping co-efficient of 5 N-s/m. Examine Damping factor, Natural frequency of the system, Logarithmic decrement, The ratio of two successive amplitude, The number of cycles after which the initial amplitude reduces to 25%	BT-4	Analyse
6.	Examine whether the log – decrement is also given by the equation $\int = 1/n \log (U_0/ U_n)$ represents the amplitude after n cycles have elapsed.	BT-4	Analyse
7.	Derive the equation of motion for SDOF system free vibration and find the solution for a) Under damped system b) Over damped system c) Critically damped system.	BT-1	Remember
8.	Solve the equation of motion of SDOF for free vibration to find out the natural frequency and angular frequency.	BT-3	Application
9.	Define and discuss the following: (i) critical damping (ii) Coulomb damping (iii) Damped circular frequency	BT-1	Remember
10.	A block of weight 900 N (moving between vertical guides) is supported by a spring of stiffness 10^6N/m. the block is given an initial displacement of 50 mm with a velocity of 300 mm/sec, determine the period of vibration, natural frequency, amplitude of motion, maximum velocity and maximum acceleration of the block. Assuming a damping of 20% and show the logarithmic decrement and the damping coefficient of the system.	BT-2	Understand
11.	A machine of 200 kg mass is supported on four parallel springs of total stiffness 750 N/m has an unbalanced rotating component which result in a disturbing force of 350 N at a frequency of 2121 rpm. If damping ratio is 0.2, Examine; (i) amplitude of motion due to the unbalance (ii) Transmissibility. (iii)Transmitted force.	BT-4	Analyse
12.	A weight attached to a spring of stiffness 530 N/m undergoes	BT-5	Evaluate

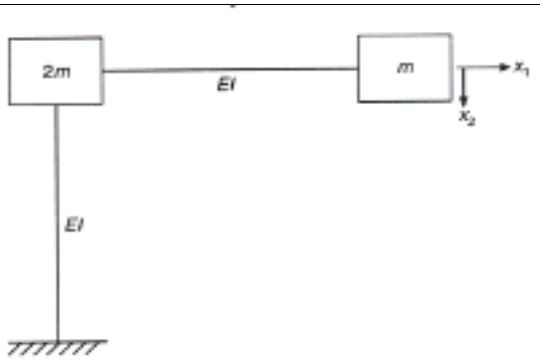
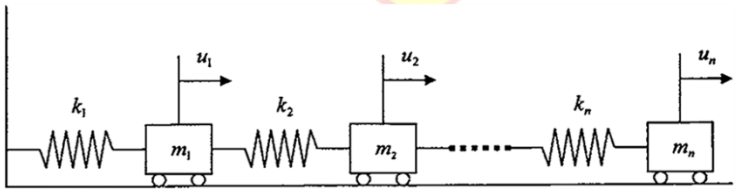
	viscous damping when the weight was displaced and released. The period of vibration was found to be 1.8 seconds. The ratio of consecutive amplitude was found to be 4/1.0. Determine the amplitude and phase angle when a force of 200 cos3t N acts on the system.		
13.	A suddenly applied force f_1 was applied to a single degree of freedom system. find the maximum dynamic load factor by (i)differential equation method (ii) Duhamel's integral method. Mass of the system: 'm' and stiffness of the system: 'k'.	BT-1	Remember
14.	An SDOF system consists of a mass of 20 kg, a spring of stiffness 2200 N/m and a dash pot with a damping co-efficient of 60 N-s/m is subjected to a harmonic excitation of F=(200 sin 5t) N. show the complete solution of the equation of motion.	BT-1	Remember

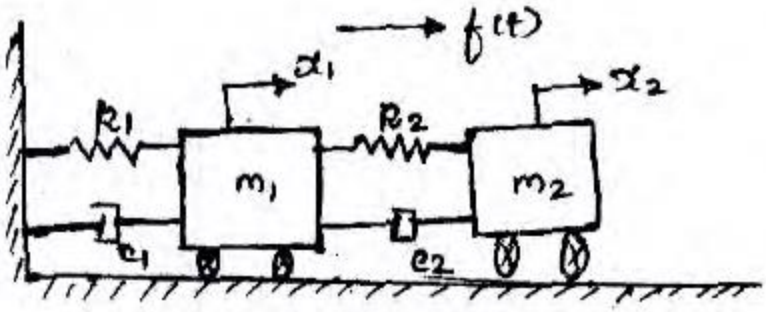
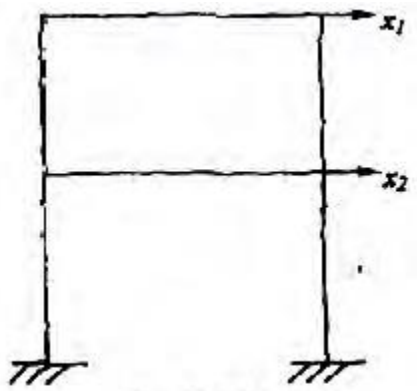
PART – C			
Q.No	**Questions**	**BT Level**	**Competence**
1	A cantilever beam AB of length L is attached to a spring k and a mass M as shown in figure 2.12. (a) Form the equation of motion; and (b) Find an expression for the frequency of motion.  Figure 2.12	BT-1	Remember
2	Develop the equation motion of system shown in Fig. 2.2.1. Consider the last spring to be nonlinear where the spring force is given by. Consider other spring and damper behaviour to be linear.  	BT-3	Application
3	A 20 kg mass attached to the lower end of a spring, whose upper end is fixed, vibrates with a natural period of 0.6 s. Determine the natural period when a 3 kg mass is attached to the mid-point of the same spring with the upper and the lower ends fixed.	BT-5	Evaluate
4	A machine can move in a vertical degree-of freedom only. It is mounted elastically to a rigid foundation. Assume that the machine can be regarded as a point mass m and that the isolator is an ideal spring, the spring rate of which is k. Show the mounted resonance frequency of the machine in the following cases: a) m = 10 kg, (i) k = 10 kN/m.(ii) k = 100 kN/m.(iii) k = 1MN/m. b) m = 100 kg,(i) k =10 kN/m.(ii) k =100 kN/m.(iii) k = 1MN/m.	BT-2	Understand

UNIT II - MULTIPLE DEGREE OF FREEDOM SYSTEM			
Two degree of freedom system – modes of vibrations – formulation of equations of motion of multi degree of freedom (MDOF) system - Eigen values and Eigen vectors – Response to free and forced vibrations - damped and undamped MDOF system – Modal superposition methods.			
PART - A			
Q.No	**Questions**	**BT Level**	**Competence**
1.	What is fundamental frequency and fundamental mode shape?	BT-1	Remember
2.	List out the assumptions made in the concept of shear building.	BT-1	Remember
3.	Compare orthogonality and normality principles.	BT-5	Evaluate
4.	Formulate the equation of motion for a damped two degrees of freedom system.	BT-6	Create
5.	Define Eigen vectors and Eigen values.	BT-1	Remember
6.	Create the equation of motion for an undamped two degrees of freedom system.	BT-6	Create
7.	What is meant by coupled and decoupling of equation?	BT-1	Remember
8.	Explain modal super position method.	BT-5	Evaluate
9.	How frequency is affected in the free vibration of a shear frame?	BT-1	Remember
10.	Define Dunkerley's method.	BT-1	Remember
11.	Identify resonant frequency.	BT-3	Application
12.	Examine impulsive force?	BT-4	Analyse
13.	Simplify mode shape?	BT-4	Analyse
14.	Analyze transitional ground motion?	BT-4	Analyse
15.	Enumerate dynamic equilibrium?	BT-3	Application
16.	Select a note on free vibration analysis.	BT-3	Application
17.	show the equation of motion for Multi-degree of freedom systems	BT-2	Understand
18.	Outline Rayleigh's method.	BT-2	Understand
19.	Illustrate model analysis?	BT-2	Understand
20.	Explain Static Condensation approach.	BT-2	Understand

Q.No	**(PART - B) Questions**	**BT Level**	**Competence**
1.	Show the orthogonality and normality principle of mode shapes.	BT-1	Remember
2.	Determine the natural frequency and draw the mode shape for the shear building.	BT-5	Evaluate

			
3.	Select the equation of motion of a two degree of freedom system for free vibration.	BT-1	Remember
4.	Analyze the natural frequency and mode of the system. 	BT-4	Analyse
5.	Solve the natural frequency and mode of vibration of the system 	BT-6	Create
6.	Determine the natural frequency and mode shapes of the following: The storey masses are M1=5, M2=4, M3=3 and storey stiffness are k1= k2= k3=2.	BT-5	Evaluate
7.	Define the natural frequencies and mode of vibration of the given System.	BT-1	Remember

			
8.	Obtaining the natural frequency and the mode shape for a single bay two storey shear frame with combined stiffness of ground and first floor columns as k =2000 kN/m respectively. Mass of each floor is 2000 kg.	BT-1	Remember
9.	Show the expression for the free vibration of a damped two degree of freedom system.	BT-2	Understand
10.	Explain the concept of shear building and modal superposition method.	BT-2	Understand
11.	A three storey building has seismic weights of 200 kN, 300 kN and 420 kN at I, II and III store's respectively; The corresponding stiffness's are 20000 kN/m, 25000 kN/m and 30000 kN/m. (i) Examine the model frequencies. (ii) Sketch the mode shapes	BT-4	Analyse
12.	Develop the natural frequencies and mode shapes of a system described by the equation of motion given below. 	BT-3	Application
13.	Develop the mode shapes and nodal frequencies of a three storey building by modal super position method. The storey masses are M1=360kg, M2=250kg, M3= 150kg and storey stiffness are K1= 3000kN/m, K2= 2000kN/m and K3=1000kN/m.	BT-3	Application
14.	Explain some approximate methods for solving MDOF systems.	BT-2	Understand

	PART - C		
Q.No	**Questions**	**BT Level**	**Competence**
1.	i) Determine the normal modes for the following system and show that the modes are orthogonal $$\begin{bmatrix} 2m & 0 \\ 0 & m \end{bmatrix}\begin{bmatrix} \ddot{x}_1 \\ \ddot{x}_2 \end{bmatrix} + \begin{bmatrix} 3k & -k \\ -k & k \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$ ii) How can you eliminate/reduce unnecessary vibrations in a structure?	BT-5	Evaluate
2.	Show the differential equation of motion in matrix form for the two degree of freedom system with damping as shown in Fig.  	BT-1	Remember
3.	i) A 200 kg machine is placed at the end of 1.8 m long steel (E = 210 x 10^9N/$m^{2)}$ cantilever beam. The machine is observed to vibrate with a natural frequency of 21HZ. What is the moment of inertia of the beam's cross section about its neutral axis? ii) Explain different methods of vibration analysis?	BT-2	Understand
4.	Solve the natural frequency and mode shapes for a single bay two storied RC shear frame shown in Fig Q.12 (a). Mass of each rigid beam is 20000 kg, combined stiffness of first storey columns is 2 x 10^6 N/m and combined stiffness of second storey columns is 2 x10^6 N/m.  Fig. Q. 12 (a)	BT-3	Application

UNIT III - ELEMENTS OF SEISMOLOGY			
Elements of Engineering Seismology - Causes of Earthquake – Plate Tectonic theory – Elastic rebound Theory – Characteristic of earthquake – Estimation of earthquake parameters - Magnitude and intensity of earthquakes – Spectral Acceleration.			
PART - A			
Q.No	**Questions**	**BT Level**	**Competence**
1.	Identify the reasons for the occurrence of faults.	BT-3	Application
2.	Explain modified mercalli intensity scale.	BT-2	Understand
3.	Define focus and epicenter.	BT-1	Remember
4.	Differentiate between P-waves and S-waves.	BT-2	Understand
5.	Distinguish between Epicenter and Hypocenter.	BT-4	Analyse
6.	Distinguish between seismograph and seismogram.	BT-4	Analyse
7.	Identify the causes of Earthquake.	BT-3	Application
8.	What is meant by hypocenter?	BT-1	Remember
9.	Define focal depth and Epicentral distance.	BT-1	Remember
10.	Compare: magnitude and intensity of an earthquake.	BT-4	Analyse
11.	Discuss the classification of seismic zones in India.	BT-6	Create
12.	Classify the types of earthquake.	BT-2	Understand
13.	List out some disastrous earthquakes occurred in past history in India.	BT-1	Remember
14.	Define fault and list its types.	BT-1	Remember
15.	Identify the factors influencing ground motion.	BT-3	Application
16.	How will you develop an Isoseismal map?	BT-3	Application
17.	Summarize the characteristics of earthquake.	BT-2	Understand
18.	How will you evaluate strong ground motion?	BT-5	Evaluate
19.	How will you assess the types of seismic waves?	BT-5	Evaluate
20.	Define Normal fault.	BT-1	Remember

PART –B

1.	Find the natural causes of earthquake and explain it briefly.	BT-1	Remember
2.	i. Explain the seismic waves with neat sketch. ii. Explain about the elastic rebound theory.	BT-2	Understand
3.	Explain in detail about the plate tectonic theory and lithospheric plates.	BT-2	Understand
4.	i. Classify the types of geological faults and explain it briefly. ii.Explain about the classification of earthquake.	BT-2	Understand
5.	i. Differentiate magnitude and intensity. ii. How will you measure magnitude and intensity.Explain the methods briefly.	BT-4	Analyse
6.	Write down the characteristics of strong ground motion with neat graph.	BT-3	Application
7.	How will you estimate the measurement of earthquakes using i. Seismograph ii. Seismogram With neat sketches.	BT-5	Evaluate
8.	What are the major plates that cause seismicity? List out the	BT-1	

	causes of earthquake occurred by manmade sources and explain it briefly.		Remember
9.	On what is the assignment of an earthquake magnitude based? Is magnitude the same as intensity? Explain	BT-1	Remember
10.	List out some of the recent earthquakes occurred and give information on some disastrous earthquakes.	BT-4	Analyse
11	Define focus and epicenter of an earthquake. Name the kinds of body waves and explain it with neat sketch.	BT-1	Remember
12	Analyze how the intensity is measured using MMI scale as per codal provisions.	BT-4	Analyse
13	Write short notes on i. Tsunami ii. Spectral acceleration.	BT-3	Application
14	Discuss about the internal structure of the earth.	BT-6	Create

PART-C

Q.No	QUESTIONS	BT	COMPETANCE
1.	Explain in detail about tectonic earthquakes briefly. List some of the past earthquakes caused by plate tectonics.	BT-2	Understand
2.	Discuss the case study on anyone of the major earthquakes occurred in India.	BT-6	Evaluate
3.	What are the typical characteristics on which an earthquake depends?	BT-1	Remember
4.	Classify the different peak amplitude parameters for a earthquake ground motion.	BT-4	Analyse

UNIT IV - RESPONSE OF STRUCTURES TO EARTHQUAKE

Effect of earthquake on different type of structures – Behaviour of Reinforced Cement Concrete, Steel and Prestressed Concrete Structure under earthquake loading – Pinching effect – Bouchinger Effects – Evaluation of earthquake forces as per IS:1893 – 2002 - Response Spectra – Lessons learnt from past earthquakes.

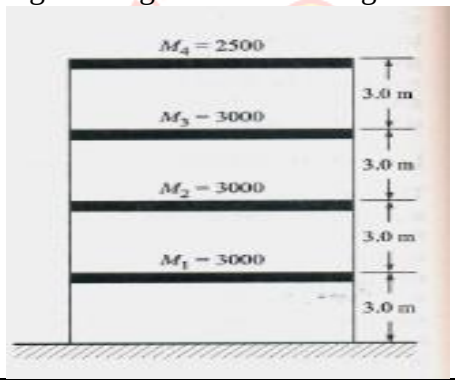
PART– A

Q.No	Questions	BT Level	Competence
1	Define Peak acceleration.	BT-1	Remember
2	Define response spectra.	BT-1	Remember
3	What is meant by re-entrant corners of irregular buildings.	BT-1	Remember
4	Define the term base shear.	BT-1	Remember
5	List out the methods of dynamic analysis.	BT-1	Remember
6	Classify the types of ir-regularities found on RC buildings during earthquake.	BT-2	Understand
7	Explain the term storey drift.	BT-2	Understand
8	Identify the major damages occur in the RC structures during earthquake.	BT-3	Application
9	Summarize about peak ground acceleration (PGA).	BT-2	Understand
10	Explain the term Response reduction factor	BT-2	Understand
11	What is soft storey failure.	BT-1	Remember
12	Identify the causes of damage occurred during bhuj	BT-3	Application

	earthquake.		
13	Write down the expression for determination of horizontal seismic coefficient.	BT-3	Application
14	Compare mass irregularities from plane irregularities.	BT-4	Analyse
15	Analyse the concept of floating column.	BT-4	Analyse
16	Distinguish between rigid diaphragm and flexible diaphragm.	BT-4	Analyse
17	How will you evaluate the distribution of design base shear along the height of the building?	BT-5	Evaluate
18	Explain some of the exterior wall damages during earthquake.	BT-5	Evaluate
19	Formulate the expression for time period as per codal provision IS 1893:2002.	BT-6	Create
20	Discuss about the pounding effect in buildings.	BT-6	Create

PART– B

1	Explain briefly the effect of earthquake on different types of structures.	BT-2	Understand
2	Illustrate about the vertical irregularities that affect the performance of RC buildings during earthquake.	BT-2	Understand
3	What is the concept of Peak acceleration and Design Spectrum describe it with neat sketches.	BT-1	Remember
4	Write the step by step procedure for seismic analysis of RC buildings as per IS 1893:2002.	BT-3	Application
5	Examine the plan configuration problems that affect the performance of RC buildings during earthquake.	BT-4	Analyse
6	In what manner is the behaviour of a soft storey construction likely to be different from a regular construction in the event of an earthquake? Explain it.	BT-4	Analyse
7	Analyse the behavior of prestressed concrete structures under earthquake loading.	BT-4	Analyse
8	List out the lessons learnt from the past earthquakes in India and explain it briefly.	BT-1	Remember
9	Explain in detail about the methods of seismic analysis.	BT-2	Understand
10	Define Response spectra. Explain the concept and types of response spectra with neat sketch.	BT-1	Remember
11	A three storeyed symmetrical RC school building situtated at Bhuj with following data: Plan dimension : 7 m Storey height : 3.5 m Total weight of beams in a storey : 130 kN Total weight of slab in a storey : 250 kN Total weight of columns in a storey : 50 kN Total weight of walls in a storey : 530 kN Live load : 130 kN Weight of terrace floor : 655 kN The structure is resting on hand rock. Determine the total base shear and lateral loads at each floor level for 5% of damping using seismic coefficient method.	BT-5	Evaluate
12	List out the step by step procedure to analyze a frame by equivalent static lateral load method.	BT-1	Remember
13	Solve the design lateral forces at each floor level for a two storey RC shear frame of a hospital building for the	BT-3	Application

	following data. Use response spectrum method of IS1893-2002. Seismic weight of each floor = 50kN Spacing between columns = 3m c/c Height of each floor = 3m Type of structure = SMRF Location of the building = Coimbatore Type of soil = Rock Combined stiffness of ground floor columns = 2000kN/m Combined stiffness of first floor columns = 1000 kN/m		
14	A four storey reinforced concrete frame building as shown in fig: is situated at Roorkee. The height between the floors is 3 m and total height of building is 12 m. The dead load and live load is lumped at respective floor. The soil below the foundation is assumed to be hard rock. Assume building is intended to be used as a hospital. Determine the total base shear as per IS1893 (PART1): 2002. Solve and distribute the base shear along the height of the building. 	BT-6	Create

PART-C

Q.No	QUESTIONS	BT	COMPETANCE
1.	Identify the seismic damages in RC buildings during Bhuj earthquake.	BT-3	Application
2.	Explain any one code based procedure for seismic analysis.	BT-2	Understand
3.	Analyze the factors affecting response spectra.	BT-4	Analyse
4.	A four storey reinforced concrete frame building is situated at Chennai. The height between the floors is 3.5 m and total height of building is 14 m. The dead load and live load is lumped at respective floor (M_1= 3000kN, M_2 =3000 kN, M_3= 3000kN M_4= 2500kN. The soil below the foundation is assumed to be hard rock. Assume building is intended to be used as a hospital. Determine the total base shear distributed lateral force as per IS1893 (PART1): 2002.	BT-5	Evaluate

UNIT V - DESIGN METHODOLOGY			
Causes of damage – Planning considerations / Architectural concepts as per IS:4326 – 1993 – Guidelines for Earthquake resistant design – Earthquake resistant design for masonry and Reinforced Cement Concrete buildings – Later load analysis – Design and detailing as per IS:13920 – 1993.			
PART –A			
Q.No	**Questions**	**BT Level**	**Competence**
1	Define ductility.	BT-1	Remember
2	Define the terms DBE, MCE and MMI.	BT-1	Remember
3	Define diaphragm discontinuity.	BT-1	Remember
4	List out the factors affecting ductility.	BT-1	Remember
5	Define ductility ratio.	BT-1	Remember
6	Identify the methods of improving element level and Global level Ductility.	BT-3	Application
7	Interpret the design philosophy adopted for earthquake resistant structure.	BT-2	Understand
8	Explain two cases of design horizontal earthquake load.	BT-2	Understand
9	Identify the importance of ductility in RC structures.	BT-3	Application
10	Examine the design considerations made in masonry structures.	BT-4	Analyse
11	Illustrate any two provisions for flexural members given in the code IS13920.	BT-2	Understand
12	Write a short note on curvature ductility.	BT-3	Application
13	Show the stress strain curve for brickwork in compression.	BT-1	Remember
14	Classify the types of damages occur in masonry building during earthquakes.	BT-2	Understand
15	Distinguish between structural and non-structural damages in masonry building.	BT-4	Analyse
16	List the planning considerations made as per IS 4326:1993 for masonry building.	BT-4	Analyse
17	How will you assess the causes of damage in RC and Masonry buildings?	BT-5	Evaluate
18	What will happen if the rigidity modulus affects the masonry structure. Justify.	BT-5	Evaluate
19	Elaborate the four techniques that mainly contributes to aseismic design of earthquake resistant building.	BT-6	Create
20	Discuss about the strong column-weak beam design concept.	BT-6	Create

PART –B

1	List out the codal provisions for architectural considerations and structural design considerations as per IS 4326:1993.	BT-4	Analyse
2	Elaborate the design principles involved in design of masonry structure.	BT-6	Create
3	Write down the various earthquake resistant features	BT-3	Application

	that can be introduced in masonry buildings.		
4	Explain the principles and practice of earthquake resistant design of R.C.C buildings.	BT-2	Understand
5	Classify the damages and non-damages occurred in masonry buildings during an earthquake with examples.	BT-2	Understand
6	Identify the different methods adopted in introducing ductility into RC structures.	BT-3	Application
7	In what manner is the behavior of a soft storey construction likely to be different from a regular construction in the event of an earthquake?	BT-4	Analyse
8	What is the effect of ignoring the contribution of masonry infill in the lateral load analysis of a multi-storey frame?	BT-1	Remember
9	Compare and contrast earthquake design of masonry and RC structures.	BT-5	Evaluate
10	i. Explain the factors affecting ductility. ii. Describe the importance of ductility in earthquake resistant design.	BT-2	Understand
11	Why ductility consideration is very important in earthquake resistant design of RC building? Explain the ductile detailing considerations in flexural members as per IS 13920-1993.	BT-1	Remember
12	Analyse the causes of damages occurred in RC building during earthquake.	BT-4	Analyse
13	List out the design principles of earthquake resistant structure as per IS 1893-2002.	BT-1	Remember
14	Define the response behavior and explain the ductility demand in multistoried buildings with neat sketch.	BT-1	Remember

PART-C

Q.No	QUESTIONS	BT	COMPETANCE
1.	Why and where special confining reinforcement is required in an earthquake resistant building?	BT-1	Remember
2.	Explain the methods to improve local and global level ductility.	BT-2	Understand
3.	Classify the different types of shear wall with neat sketches	BT-4	Analyse
4.	Design the special confining reinforcement for the size of column 650mm x 500mm. Let the grade of concrete be M20 and that of steel Fe415.	BT-6	Evaluate

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CE6701 -STRUCTURAL DYNAMICS AND EARTHQUAKE ENGINEERING

QUESTION BANK

S.no	Unit		BT1	BT2	BT3	BT4	BT5	BT6	Total Question
1	Unit-1	Part-A	6	4	3	3	2	2	20
		Part-B	4	3	2	3	1	1	14
		Part-C	1	1	1	1	1	-	4
2	Unit-2	Part-A	6	4	3	3	2	2	20
		Part-B	4	3	2	3	1	1	14
		Part-C	1	1	1	-	1	-	4
3	Unit-3	Part-A	6	4	3	3	2	2	20
		Part-B	4	3	2	3	1	1	14
		Part-C	1	-	1	1	-	1	4
4	Unit-4	Part-A	6	4	3	3	2	2	20
		Part-B	4	3	2	3	1	1	14
		Part-C	-	1	1	1	1	-	4
5	Unit-5	Part-A	6	4	3	3	2	2	20
		Part-B	4	3	2	3	1	1	14
		Part-C	1	1	-	1	-	1	4
Cumulative		Part-A	30	24	15	15	10	10	100
		Part-B	20	15	10	15	5	5	70
		Part-C	5	3	5	4	-	2	20

TOTAL NO.OF QUESTIONS IN EACH PART

PART A	**100**
PART B	**70**
PART C	**20**
TOTAL	**190**