KUMARAGURU
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Register Number:……..

B.E DEGREE EXAMINATIONS: NOV/DEC 2014

(Regulation 2009)

Seventh Semester

CIVIL ENGINEERING

CEE202**:** Basics Of Dynamics and Aseismic Design

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The maximum response of the vibrating body from its mean position is
   a) vibration b) response spectrum
   c) amplitude d) resonance
2. The ratio of dynamic displacement at any time to the displacement produced by static application of load.
   a) logarithmic decrement b) displacement ratio
   c) half-power bandwidth d) magnification factor
3. In the principal mode of vibration, the amplitude of one of the masses is
   a) Greater than unity b) Unity
   c) Equal to zero d) Less than unity
4. All the horizontal members are restrained against rotation in a shear building, the structure behaves like a
   a) cantilever beam b) Simply supported beam
   c) Fixed beam d) Continuous beam
5. The earthquake occurring along the boundaries of the tectonic plates are called
   a) Intra plate b) Inter plate
   c) Convergent boundary d) Divergent boundary
6. The earth where seismic waves are generated by sudden release of stored elastic building
   a) Fault b) focus
   c) hypocenter d) Dip-strike
7. A clayey soil would be considered liquefiable if,

a) The weight of the soil particles is not finer than 0.005mm
b) liquid limit of the soil is less 35%.
c) w>0.9wL
d) Its plastic limit=liquid limit

8. An infinitely rigid structure has natural period
a) T=0
b) T=1
c) T>0
d) T>1

9. Earthquake force is an inertia force which is
a) Less than mass times acceleration
b) Greater than mass times acceleration
c) equal to mass times acceleration
d) A peak ground acceleration

10. Additive shear will be super-imposed for a statically applied eccentricity of with respect to centre of rigidity.
a) $\pm 0.05 b_i$
b) ± 0.07bi
c) ± 0.06bi
d) ± 0.005bi

PART B (10 x 2 = 20 Marks)

11. Write a short note on simple Harmonic motion.
12. State D'Alembert's principle.
13. Define degrees of freedom.
14. Compare two degree of freedom with multi degree of freedom system.
15. What is meant by Epicenter and focus?
16. Define the term Magnitude.
17. What is meant by soil liquefaction?
18. What do you understand by Response reduction factor (R)?
19. Write down the steps to improve Global level Ductility?
20. Name types of dampers.

PART C (5 x 14 = 70 Marks)

21. a) Classify effects of damping and explain in detail about viscous and structural damping.

(OR)

b) (i) A harmonic motion has a time period of 0.2 secs and an amplitude of 0.4 cm. find the maximum velocity and acceleration. (10)

(ii) Give a detailed description of free and forced vibration system. (4)

22. a) A spring of stiffness 20 kN/m supports a mass of 4 kg. The mass is pulled down

8 mm and released to produce linear oscillations. Calculate the frequency and periodic time. Calculate the displacement, velocity and acceleration for 0.05 s after being released.

(OR)

	b)	(i)	Derive the expression for a two degrees of freedom system.	(10)
		(ii)	Explain the concepts of shear building in two degrees freedom system.	(4)
23.	a)	(i)	Elastic rebound theory - Explain in detail.	(7)
		(ii)	Describe briefly the tectonic plate theory?	(7)

(OR)

	b)	(i)	Explain the seismogram and its working principle with neat sketch.	(10)
		(ii)	Differentiate between magnitude and intensity of an earthquake.	(4)
24.	a)	(i)	Explain the Importance of Ductility in Earthquake Resistant structure?	(10)
		(ii)	Explain the Site Specific Response Spectra.	(4)

(OR)

	b)	(i)	Effect of Soil Properties and Damping on Seismic performance of Structures.	(10)
		(ii)	Explain the concepts of peak ground acceleration? (PGA)	(4)
25.	a)	(i)	Explain the Concept, need and mechanism of Base Isolation Technique.	(10)
		(ii)	What are the commonly used types of dampers.	(4)

(OR)

	b)	(i)	Give the main criteria for earthquake resistant measures as per IS 1893.	(7)
		(ii)	Give the provisions for ductile detailing of concrete structures subjected to seismic forces as per IS 13920.	(7)

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