Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Civil Engg.) (Sem.–5)

ELEMENTS OF EARTHQUAKE ENGINEERING

Subject Code : BTCE-502-18

M.Code : 78461

Date of Examination : 22-12-2022

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

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SECTION-A

1. Write briefly :

a) Define Seismic gap.

b) Define negative damping.

c) Define transverse waves.

d) What is the moment resisting frames?

e) What is over damped system?

f) List any three typical damages occur in masonry structures due to earthquake.

g) What is soft storey failure?

h) What is transmissibility ratio?

i) Enlist various code with specification related to dynamic analysis of structures.

j) Define the terms DBE and MCE.

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SECTION-B

2. Formulate the equation of motion for free vibration response of undamped SDOF system.

3. What are shear walls? Discuss the various factors which influence the structural performance of shear walls.

4. What are special provisions should be taken care for earthquake resistant structures as per BIS 4326?

5. Describe in detail the causes of earthquakes.

6. Write a short note on seismic design philosophy.

SECTION - C

7. a) Explain Floor Diaphragm action along with the modelling of rigid and flexible diaphragm.

   b) Explain how natural frequency and mode shapes of a building are determined.

8. Under which circumstances ductile detailing is provided? Sketch out the ductile detailing for beam and columns.

9. A vibrating system consisting of a weight of W = 35N and a spring with stiffness k = 30N/m is viscously damped so that the ratio of two consecutive amplitudes is 1.00 to 0.85. Determine:

   a) The natural frequency of undamped system

   b) The logarithmic decrement

   c) The damping ratio

   d) Damping coefficient

   e) The damped natural frequency.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

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