Printed Pages – 4 Roll No. : .....

320680(20)

B. E. (Sixth Semester) Examination, April-May 2020

(New Scheme)

(Civil Engineering Branch)

EARTHQUAKE ENGINEERING

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Attempt all questions. Part (a) of all the question are compulsory carrying 2 marks while answer any **two** parts from (b), (c) and (d) carrying 7 marks each.*

1. (a) Zone factor generally represents :

(i) Seismicity of a region

(ii) Importance of the structure

(iii) Size of structure

(iv) None of these

(b) Derive the motion equation for the forced undamped vibration.

(c) Derive the motion eqution for the free damped vibration.

(d) Explain seismic surface waves with schematic diagrams.

2. (a) Generally damping for steel structure is taken as :

(i) 5% of critial damping

(ii) 2% of critical damping

(iii) 10% of critical damping

(iv) 20% of critical damping

(b) List the four virtues of good earthquake resistance design and describe any one in detail.

(c) List and sketch the earthquake resistance feature of ordinary brick masonry structure.

(d) Explain earthquake design philosophy for buildings.

3. (a) Generally Intensity of earthquke :

(i) Increase away from the epicenter

(ii) Remains constant

(iii) Decreases away from the epicenter

(iv) None of these

(b) Explain soft storey? Explain how soft storey problems can be eliminated in the existing buildings.

(c) Explain how ductile design is helpful for better earthquake resistance.

(d) Derive the equation of motion and its solution for forced undamped vibration system.

4. (a) Earthquake is classificed as shallow focus if focal depth is :

(i) Less than 70 km

(ii) Less than 7 km

(iii) Less than 14 km

(iv) Less than 700 km

(b) Write short note on Liquefaction and remedial measures.

(c) Describe various strengthening methods foe RCC columns and beams through illustrative sketches.

(d) Explain the term in detail "Peak Ground Acceleration".

5. (a) Maximum intensity scale based on MSK scale is :

(i) X

(ii) V

(iii) XI

(iv) XII

(b) Discuss the behavior of the following masonry walls in seismic regions :

(i) Reinforced Masonry wall

(ii) Infill masonry wall

(c) Explain failures of masonry structures observed in past earthquakes and how will you improve performance of masonry building.

(d) Draw the detailed sketch of :

(i) Different ways of beam jacketing as IS code &

(ii) Placing of vertical bars and closed ties in columns as per IS code