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BICEE-006

DIPLOMA IN CIVIL ENGINEERING
(DCLEVI / DELVI)

00505

Term-End Examination

December, 2014

BICEE-006 : EARTHQUAKE ENGINEERING

Time : 2 hours *Maximum Marks : 70*

Note : *Question no. **1** is **compulsory**. Answer any **five** questions. Assume missing data, if any.*

1. Write *True* or *False* for the following : $7 \times 2 = 14$

(a) Surface wave consists of Love waves and Rayleigh waves. (T/F)

(b) Under S-wave material particles undergo extensional and compressional strains along the direction of energy transmission. (T/F)

(c) For earthquake resistant buildings beams are made strong and columns weak to make the structure earthquake resistant. (T/F)

(d) Flexure failure is desired as compared to brittle failure in earthquake resistant structure. (T/F)

(e) Short column are stiffer and attract larger forces during earthquakes. (T/F)

(f) India is divided into four seismic zones as per IS 1893 (Part-1) : 2002. (T/F)

(g) S-waves in association with Love waves causes maximum damage to structure. (T/F)

2. An unknown mass 'm' kg attached to the end of an unknown spring k has a natural frequency of 90 cpm. When a 0·5 kg mass is attached to m, the natural frequency is lowered to 70 cpm. Determine the unknown mass m and the spring constant k. *14*

3. A body of mass 1·25 kg is suspended from a spring with a scale of 2 kN/m. A dashpot is attached between the mass and the ground, and has a resistance of 0·5 N at a velocity of 50 mm/s. Determine

(a) the natural frequency of the system.

(b) the critical damping factor of the dashpot.

(c) the logarithmic decrement. *14*

4. Discuss briefly plan irregularities and vertical irregularities as per IS 1893 (Part-1) : 2002 with a neat sketch. *14*

5. Explain the various causes of earthquakes. Discuss in brief the plate tectonic theory. *14*

6. What are the important features of ductile detailing for RC Building in seismic zone as per IS 13920 : 1993 ? Explain in detail. *14*

7. Write short notes on any ***four*** of the following :

$4 \times 3\frac{1}{2} = 14$

(a) Seismic Coefficient Method

(b) Design Spectrum

(c) Duhamel Integral

(d) Love waves and Secondary waves

(e) Retrofitting and Strengthening

(f) Construction aspects of Masonry and Timber structures

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