

**DIPLOMA IN CIVIL ENGINEERING
(DCLEVI / DELVI)**

Term-End Examination

June, 2016

00276

BICEE-006 : EARTHQUAKE ENGINEERING

Time : 2 hours

Maximum Marks : 70

Note : *Question no. 1 is compulsory. Answer any four questions from the remaining questions. Assume missing data, if any. Use of scientific calculator is allowed.*

1. Choose the correct option in questions (a) to (g) below :

$7 \times 2 = 14$

- (a) Earthquakes generally occur at plate boundaries, where
- (i) stress on rocks is greatest
 - (ii) stress on rocks is low
 - (iii) soft rock is found
 - (iv) magnetic pull is greatest
- (b) Which scale more accurately measures the magnitude of large earthquakes ?
- (i) Modified Mercalli Scale
 - (ii) Richter Scale
 - (iii) Moment Magnitude Scale
 - (iv) Mohs Scale

- (c) What is elastic rebound ?
- (i) The sudden return of deformed rock to its undeformed shape
 - (ii) The gradual return of deformed rock to its undeformed shape
 - (iii) The sudden return of undeformed rock to its deformed shape
 - (iv) The gradual return of undeformed rock to its deformed shape
- (d) Fault zones form at plate boundaries because
- (i) seismic gaps and shadow zones form there
 - (ii) very little rock stress and strain occur there
 - (iii) intense stress occurs there when the plates separate, collide, subduct or slide past each other
 - (iv) they have a long geologic history of occurring
- (e) Which of the following causes earthquakes ?
- (i) Elastic rebound
 - (ii) Faults
 - (iii) Large cities
 - (iv) Release of heat wave

- (f) The Himalayas have emerged from which interplate interaction ?
- (i) Divergent plate boundary
 - (ii) Convergent plate boundary
 - (iii) Transformed plate boundary
 - (iv) None of these
- (g) Earthquake is classified as shallow focus if the focal depth is
- (i) less than 70 km
 - (ii) less than 7 km
 - (iii) less than 14 km
 - (iv) less than 700 km

2. What are the different types of seismic waves ? Compare their characteristics and manner of movement. 14

3. Derive an expression for the equation of motion of SDOF system for a viscously damped system. 14

4. (a) What do you understand by 'seismic zones' ? What is the use of a seismic zone in construction ? 7

(b) Discuss the precautions to be taken in the construction of masonry buildings for making them earthquake resistant. 7

5. (a) What do you understand by intensity of an earthquake ? Explain briefly. 7
(b) What do you understand by 'Focus' of an earthquake. Explain with a neat sketch. 7
6. Describe the salient features of buildings required for making them earthquake resistant. 14
7. Write short notes on any *four* of the following : $4 \times 3 \frac{1}{2} = 14$
- (a) Mode Shape
 - (b) Irregular Buildings
 - (c) Infill Walls
 - (d) Isoseismal Map
 - (e) Earthquake Losses
 - (f) Non-Structural Elements
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