

**BENGAL ENGINEERING AND SCIENCE UNIVERSITY, SHIBPUR**  
**B.E. 7<sup>TH</sup> SEMESTER (CIVIL) FINAL EXAMINATIONS, 2011**  
**Disaster Mitigation (CE 703)**

**Full Marks: 70**

**Time: 3 hrs**

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FIRST HALF

Answer any **three** questions. All questions carry equal marks. Two marks are kept for neatness.

1. a) How is physical exposure evaluated?
  - b) Enumerate the various forms of vulnerability indicators.
  - c) What is multi-hazard disaster risk model? Discuss its purpose and drawbacks.
  
2. Briefly discuss the mechanism of destruction, hazard assessment and mapping techniques, and main mitigation strategies with respect to disaster due to the following natural events: (i) Flood, (ii) Earthquake, (iii) Cyclone
  
3. a) What are the various components of disaster preparedness framework?
  - c) Explain top-down and bottom-up approaches in planning for disaster preparedness. In this regard discuss the importance of CBDM.
  - c) Discuss about institutional framework for disaster management.
  
4. a) What are the various Technology Options available at hand for disaster mitigation?
  - b) Discuss the role of ICST, GIS and GPS in disaster management.
  
5. Write short notes (any Three):
  - (i) Losses from disasters
  - (ii) DRI is not a predictive model
  - (iii) Paradigm shifts in DRR
  - (iv) Technological hazards
  - (v) Components of disaster management

## SECOND HALF

Answer question No.6 and any two from the rest of this half

Q 6. Write short notes on any three from the following:

3@5=15

- (a) Factors affecting liquefaction of soil.
- (b) Reasons for land slides
- (c) Downhole test for liquefaction assessment of soil
- (d) Cyclic stress ratio and cyclic resistance ratio
- (e) Effect of soil liquefaction on structures

Q 7. (a) Explain the method for assessment of liquefaction resistance of soil using SPT

(b) The following SPT values were recorded in a soil exploration work carried out at BESUS campus. SPT values used in India deliver about 65% of theoretical free fall energy to the sampler. The unit weight of the soil deposit is  $18.5 \text{ kN/m}^3$  up to 12 m of depth. The water table is located at 1.5 m below Ground level. Compute  $(N_1)_{60}$  and plot them with respect to depth. Assume any relevant data required.

Depth (m)	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0
$N_m$	5	4	2	8	12	15	17	25

4+6=10

Q 8. (a) Enumerate the factors to be considered for selection of suitable ground improvement method for liquefaction hazard mitigation.

(b) Discuss any one ground improvement method.

5+5 = 10

Q 9. (a) Enumerate the key elements of landslide risk management framework

(b) Explain the remedial methodology to be adopted for enhancing the stability of slope.

5+5 = 10

Q 10. (a) Explain the mechanism of soil liquefaction

(b) Compare the advantages and disadvantages of field tests like CPT, SPT and Cross hole test for assessment of liquefaction resistance of soil.

5+5 = 10