

D 21788

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Name.....

Reg. No.....

**EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
NOVEMBER 2011**

CE 04 804 D—COASTAL ENGINEERING AND MARINE STRUCTURES

(2004 Admissions)

Time : Three Hours

Maximum : 100 Marks

Answer all the questions.

- I. (a) What are the various minerals found in Ocean Zones ? Explain the properties of any *four* minerals.
(b) Write short notes on wave energy and wave pressure.
(c) Write short notes on fetch, wind velocity and wave forecasting.
(d) Compare and contrast mass transport velocity, wave celerity and wind velocity.
(e) Discuss wave current interaction.
(f) Write a brief note on Tsunami generation, propagation and warning systems.
(g) Explain the effect of shore erosion due to sea level rise.
(h) What is meant by Beach nourishment ? Explain the various methods adopted for Beach nourishment.

(8 × 5 = 40 marks)

- II. (a) Explain the role of ocean as a waste disposal. (8 marks)
(b) A wave with a height of 5.5 m and period 8 sec propagates in a water depth of 15 m. Determine the local horizontal and vertical velocities at a depth of 3 m below the SWL when phase angle is 60°.

(7 marks)

Or

- (c) Explain the importance of integrated coastal zone management. (8 marks)
(d) Ocean waves measure 90 m from crest to crest when travelling at a point at a speed of 32 km/hr. Find the depth in the ocean at this point and the period of waves. If the waves were fully grown, and their steepness, $H/L = 2/3$, when is the wave height.

(7 marks)

- III. (a) Briefly write the salient features of Stokes wave theory. (8 marks)
(b) Enumerate in detail about solitary wave theory and Gerstner theory. (7 marks)

Or

Turn over

- (d) What are the different types of common wave theories? Draw the profile shapes of different wave theories with the definition of wave parameters.

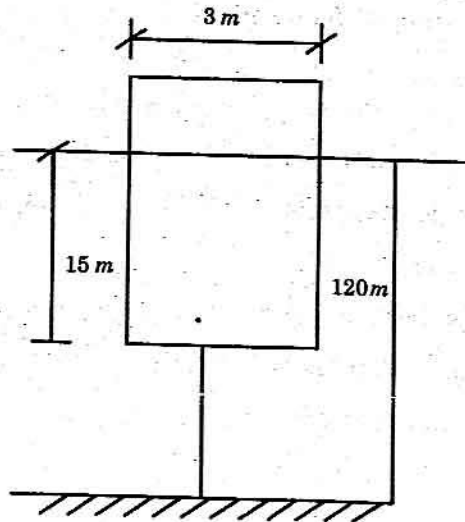
(8 marks)

- (d) Briefly explain the various procedures adopted for determination of wave forecasting.

(7 marks)

- IV. (a) Discuss clearly the phenomena of wave sharing, refraction and diffraction. (8 marks)

- (b) A single point mooring (SPM) buoy 3 m in diameter is anchored in 120 m water depth as shown in Fig. below. The SPM has a draft of 15 m. If the significant wave height is 2.5 m and the period is 12 sec, calculate the maximum wave form acting on the buoy.



(7 marks)

Or

- (c) Discuss Froude Krylov force and derive expressions for the forces on a submerged box of cross section $(2a \times 2a)$, a height h resting on the sea bed in a water depth d , and exposed to the action of waves.

(8 marks)

- (d) Write in detail about the wave forces on vertical wall due to non breaking waves, breaking waves and broken waves.

(7 marks)

- V. (a) Explain the phenomena of long shore sediment transport and discuss CERC method of predicting the quantity of sediment transport.

(8 marks)

- (b) Discuss the phenomena of scour under structures due to waves on phenomena of liquefaction and measures to control the same.

(7 marks)

Or

- (c) Design a rubble mound breakwater for a water height of 10 m. The design waveheight at the site is 3.5 m with a wave period of 10 sec.

(8 marks)

- (d) Enumerate the various factors influencing beach characteristics.

(7 marks)

[4 × 15 = 60 marks]