

**EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, JUNE 2010**

CE 04 804 (D) – COASTAL ENGINEERING AND MARINE STRUCTURES

Time : Three Hours

Maximum : 100 Marks

*Answer all questions.***Part A**

- I. 1. Enumerate about Integrated Coastal Zone Management and its importance in India.
2. What are the boundary conditions for small amplitude wave theory? Classify the Waves in various aspects.
3. Write a brief note on Fast Fourier Transform method.
4. Mention few spectral models for a wave spectra and explain any *two* types.
5. What is a Froude Krylov force? Explain the force and moment equations for Froude Krylov forces.
6. Explain the basic concept of Wave Refraction.
7. Enumerate the various factors influencing beach characteristics.
8. What is a sea wall? Classify sea walls with neat sketches.

(8 × 5 = 40 marks)

Part B

- II. (a) For a wave of height 2 m and period 7 secs, plot the variation of orbital velocity and acceleration in the vertical and horizontal directions of a particle at a position 4 m below SWL and 20 m above the seabed. Estimate the maximum velocities at this position, at SWL and at the seabed.
- Or*
- (b) If a pressure sensing instrument is set up at 4 m below SWL in a water depth of 20 m, determine the phase distribution of pressure head this instrument would record. Plot this pressure head against phase and compare this result to the phase variation of hydrostatic pressure. The wave height is 2 m and period is 10 sec. and $\gamma = 1020 \text{ kg/m}^3$.
- III. (a) Compare and contrast various wave theories such as Solitary wave theory, Stoke's wave theory and Small amplitude wave theory.

*Or***Turn over**

- (b) Find the energy distribution of an irregular seaway composed of four different waves having the following characteristics :

Wave No.	1	2	3	4
Wave Length	380	170	96	61
Wave Height	3	5	4	2

- IV. (a) A pile of diameter, D of 0.75 m is to be installed in a water depth, d of 100 m. The wave height, H and period T are 6 m and 10 sec respectively. With $C_D = 1.0$, $C_M = 2.0$ and specific weight of seawater = 1020 kg/m^3 , compute the maximum wave force.

Or

- (b) Enumerate in detail about Diffraction, Refraction and Reflection.
- V. (a) (i) Describe in detail about the breakwaters and their classification. Also discuss the design procedure of a rubble mound breakwater by using Hudson's formula.
- (ii) Write a brief note on Long shore sediment transport and their interactions with shore structures.

(10 + 5 = 15 marks)

Or

- (b) (i) Enumerate in detail about Beach Nourishment, methods of Beach Nourishment and factors influencing the Beach Nourishment.
- (ii) What is groyne? Explain with a neat sketch the different types of Groynes.

(8 + 7 = 15 marks)

[4 × 15 = 60 marks]