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# Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)



## VI SEMESTER B.TECH (CIVIL ENGINEERING)

### END SEMESTER EXAMINATIONS, MAY 2016

### SUBJECT: COASTAL ENGINEERING [CIE 326] - Program Elective II

#### REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

#### Instructions to Candidates:

- ❖ Answer **ANY FIVE FULL** the questions.
- ❖ Missing data may be suitable assumed.

- 1A. Define waves and briefly explain its classification . 4
- 1B. What are wave theories and how are they classified? Also sketch a regular wave profile with wave parameters. 3
- 1C. Determine the wave period and celerity for a wave having a length of 125 m in 20 m depth of water using Airy's wave theory. 3
- 2A. List the uses of beach profile. Write a note how beach processes effect sediment transport. 4
- 2B. Explain wave energy and wave power along with the expression. 3
- 2C. Calculate the maximum wave force on a pile of diameter 1.5 m on a water depth of 30 m. The wave height at the site is 12 m with wave length of 130 m. Assume  $C_d = 1$ ,  $C_M = 2$  and density of water as  $1030 \text{ kg/m}^3$ . 3
- 3A. What are the conditions for wave breaking? Explain spilling and plunging breakers. 6
- 3B. What are the factors responsible for wave deformation? Explain the phenomenon of wave reflection and wave diffraction. 4
- 4A. List out the natural and manmade causes for coastal erosion. 4
- 4B. Design a seawall with rip rap revetment for a location pertaining following conditions 6

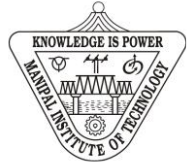
Design wave height	=	3 m
Storm surge	=	1.5 m
Maximum tidal level (above CD)	=	1 m
Water depth at the toe of the structure	=	-3 m (from CD)
Wave runup	=	2.5 m
Seaward slope	=	1: 1.5
Type of material	=	quarried stone

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- 5A. Write a short note on :- 6  
     i) Slipways ii) Bulkheads iii) Mangroves
- 5B. What are the disadvantages of Artificial beach nourishment? 2
- 5C. What are the requirements of a good harbour. 2
- 6A. What is a berthing structure? With the help of neat diagram explain various types of berthing structures. 4
- 6B. Explain the steps involved in the design of rubble mound breakwater. 4
- 6C. What are the advantages of composite breakwaters? 2