MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

MANIPAL INSTITUTE OF TECHNOLOGY

SEVENTH SEMESTER B.TECH. (CIVIL ENGINEERING)

END SEMESTER EXAMINATION, Dec 2023

COASTAL ENGINEERING (CIE 4076)

(–12 - 2023)

TIME: 3 HRS. **MAX. MARKS: 50**

Note: 1. Answer all questions.
2. Any missing data may be suitably assumed.

Q. NO	QUESTION	MARKS	CO	BL
1A	A certain location of sea has a water depth of 15 m, wave height of 4 m and wave period of 10 sec. Determine wave number, Angular frequency, wave length, wave speed and obtain the maximum horizontal velocity.	**4**	**1**	**3**
1B	Derive the expressions for water particle displacements for linear water wave.	**2**	**1**	**3**
1C	Interpret the conditions for wave breaking in ocean environment	**4**	**2**	**3**
2A	Summarize the available soft measures for coastal protection	**3**	**3**	**4**
2B	With a neat sketch demonstrate how the length and spacing of groynes is analyzed.	**3**	**3**	**4**
2C	A vertical wall breakwater of 14 m height is designed with the following data: Water depth - 8 m Spring tide - 0.5 m Wave length - 95 m Refraction coefficient - 0.82 Shoaling coefficient as 0.92. Deep water Wave height - 4 m and Wave period 6.5 sec. Check whether the height of structure is adequate to prevent over topping. Find the wave pressure and draw the wave pressure diagram acting on the wall.	**4**	**3**	**4**
3A	Diagnose the long-term effects of coastal pollution and suggest remedies.	**3**	**4**	**3**
3B	Point out the importance of Environment Impact Assessment during port construction	**3**	**4**	**3**

3C	Specify the requirements of a good harbour. Explain how berth occupancy ratio effects port functionality.	**4**	**4**	**2**
4A	Explain briefly with figures the structures for repair and maintenance of vessels	**4**	**4**	**2**
4B	Specify the factors affecting the selection of type of Breakwater	**3**	**5**	**3**
4C	Describe the parameters to be considered for obtaining the dimensions of berthing structures	**3**	**5**	**2**
5A	Design and draw a cross-section of head of rubble mound breakwater at a location with following details Mean water depth – 9 m Design wave height – 4 m, Wave period-8 Sec Wave runup - 3 m Tidal correction – 1 m Armour unit – Quarried natural rocks up to 110 kN size with Unit weight of 2.6 t/m^3 can be used. Take K_D – 3.2 and K_Δ - 1.	**5**	**5**	**4**
5B	Explain how berthing load and mooring load are considered in the design of berthing structure.	**3**	**5**	**2**
5C	Point out the limitations of Hudson's formula used for rubble mound breakwater design	**2**	**5**	**3**