Ref No. Ex/PG/CE/T/1210D/2017

MASTER OF CIVIL ENGINEERING 2nd SEMESTER. 2017

(2ndSemester)

SUBJECT: **COASTAL AND OFFSHORE GEOTECHNOLOGY**

Time: Three hours **Full Marks: 100**

Use a separate Answer-Script for each part

1. Answer ALL questions.
2. Maintain neatness.
3. No code etc. will be needed to answer the questions of this part

No. of Question	Part –I (40 Marks)	Marks
Q.1 a)	Illustrate the differences between "continental rise" and "continental slope" with the help of a neat sketch.	5
b)	Illustrate different reasons of development of excess pore pressure in case of marine deposit.	10
Q.2	Illustrate the effect of undrained cyclic loading on both contractive and dilative soils and bring out their differences.	10
Q.3	Illustrate shallow and deep sampling in connection with marine geotechnical investigation.	10
Q.4	Illustrate how bearing capacity and sliding resistance are considered for stability analysis of a gravity platform.	5

Ref. No. **Ex/PG/CE/T/1210D/2017**

MASTER OF CIVIL ENGINEERING EXAMINATION 2017
(2nd Semester)

COASTAL AND OFFSHORE GEOTECHNOLOGY
(Paper X)

Time: Three Hours

Full Marks: 100
PART I: 40 Marks PART II: 60 Marks

Use a separate Answer-Script for each part

No. of questions		PART II (60 Marks)	Marks
		*Answer any **THREE** questions from this PART. Assume suitable values for the parameters if not supplied*	
1	(a)	What is Wave stiffness? What is the range of wave stiffness in case of wind generated waves?	1+2=3
	(b)	Two waves having same height, but different stiffness. Which of the two waves will travel faster?	3
	(c)	Discuss the motion of water particles, while transferring the energy in case of progressive wave.	3
	(d)	What are the expressions of wave speed in general, as well as, in deep water and shallow water as per surface wave theory?	3
	(e)	Discuss the assumptions made in surface wave theory.	6
	(f)	Express the group wave celerity in case of deep water and shallow water.	2
2	(a)	What is littoral drift in ocean? What are the parameters on which littoral drift depends?	2+4=6
	(b)	Define: Point source and sink, Line source and sink, Littoral cell, Balanced littoral cell.	4x1=4
	(c)	Draw a schematic diagram of the coastal cell for its sediment budgeting.	4
	(d)	What are the steps involved for coastal sediment budgeting? Explain briefly.	6
3	(a)	What is called wave motion? How many types of wave motions can be seen in the ocean? Explain briefly.	2+3=5
	(b)	Define: (i) Group wave celerity; (ii) Wave steepness; (iii) Significant wave height	3x1=3
	(c)	In a wave measurements programme, the wave height and period was measured at a water depth of 9.0m as follows:	12

Wave Height (m)	1.70	1.69	1.68	1.62	1.57	1.60	1.63	1.69	1.59	1.48	1.60	1.62
Wave period (sec)	12	11	11	12	10	10	10	11	10	9	10	11

Find the following:
(i) Significant wave height; (ii) Wave celerity and group wave celerity; (iii) Wave power and energy; (iv) Wave length; (v) Breaker height and length, if breaker depth is 2.0m.

4	(a)	What are the assumptions made in tide theory?	2
	(b)	What are the forces responsible for tide generation?	2
	(c)	Define 'Equilibrium tide' and 'Daily inequality in tide'.	3x2=6
	(d)	On the line joining Earth and Moon, A and B are diametrically opposite two points on the Earth's surface, on equator. Prove that the tide producing force at A and B would be same in magnitude but opposite in direction. Neglect the Sun's Gravitational attraction.	10