

**Indian Maritime University**  
**(A Central University, Govt of India)**  
**End Semester Examinations – December 2022**  
**Programme Name: M. Tech (NAOE)**  
**Semester: 1<sup>st</sup> Semester**  
**Subject Code: PG11T2103**  
**Subject Name: INTRODUCTION TO OCEAN ENGINEERING**

---

Date: 27.12.2022

Max Marks: 60

Duration: 03 Hrs

Pass Marks: 30

---

**Section A:**

10 MCQs of 01 Mark Each = 10 Marks

1. Absolute pressure is measured against the standard atmospheric pressure.  
A) True  
B) False
2. Center of gravity of a floating body is the centroid of the submerged volume  
A) True  
B) False
3. Celerity of a water wave increase as depth decreases  
A) True  
B) False
4. The buoyancy of the tension-leg platform TLP is greater than its weight  
A) True  
B) False
5. Lines of constant salinity are called Isohalines  
A) True  
B) False
6. Identify the device used to measure the sub-surface temperature of sea/ocean water  
A) Stem thermometer  
B) Protected reversing thermometer  
C) Infrared thermometer  
D) Strip-type thermometer
7. Density in the ocean is determined by temperature, \_\_\_\_\_, and pressure.
8. \_\_\_\_\_ of sunlight is absorbed in the upper 100 m of the clearest sea water. Sunlight rarely penetrates deeper than a few meters in turbid coastal waters.  
A) 95%  
B) 100%

- C) 80%
- D) 75%

9. \_\_\_\_\_ change the color of sea water, and the change in color can be observed from space.

10. Exclusive Economic Zone (EEZ) is a region \_\_\_\_\_ nautical miles from coast line as per the united nations convention on the law of seas (UNCOLS)

- A) 100
- B) 50
- C) 200
- D) 150

### Section B:

5 out of 7 Questions of 8 Marks Each = 40 Marks

11. With a neat sketch explain the various features of an FPSO & describe the FPSO's offloading system.

12. Explain various features of the *sea -floor* and their characteristics. What are the safe and unsafe locations for offshore structures?

13. Define Ocean currents and different types of currents observed across the oceans.

14. Discuss various techniques used to measure ocean's temperature, pressure & salinity

15. Discuss the significance of deep circulation in oceans.

16.

- A) Discuss the significance of Mudmat in offshore structures. [3Marks]
- B) What are the various types of Mooring Systems used offshore? What selection criteria are used in their design? [5Marks]

17.

A) Describe seafloor sediments with their characteristic features and composition. [4Marks]

- B) With neat sketches write notes on
  - Jacket platforms
  - Semi-submersibles [4Marks]

### Section C:

1 out of 3 Questions of 10 Marks Each = 10 Marks

18. Discuss various classifications of offshore structures with neat sketches.

19. Derive Ekman Mass Transport equation & discuss application Ekman theory.

20. Derive Linear Theory of ocean surface waves.