UPES
End Semester Examination, May 2023

Course: Offshore Operations
Program: M. Tech (PE)
Course Code: PEAU 7003

Semester: II
Time : 03 hrs.
Max. Marks: 100

Instructions: All questions are compulsory.

SECTION A
(4Qx5M=20Marks)

S. No.		Marks	CO
Q1.	Explain the difference between center of gravity and center of buoyancy. Also discuss when will the center of gravity and center of buoyancy will be at same position in a vessel.	5	CO1
Q2.	State the differences between Catenary and Taut Leg Mooring system.	5	CO1
Q3.	Describe the mobile offshore drilling rigs with approximate maximum water depth in which they can operate.	5	CO2
Q4.	Illustrate the role of heave compensator and riser tensioner during drilling operation done from a semi-submersible rig.	5	CO2

SECTION B
(4Qx10M= 40 Marks)

Q5.	Elaborate the significance of Mooring system and discuss the different types of mooring system.	10	CO2
Q6.	Explain environmental pollution related challenges in offshore operations and how they may be addressed.	10	CO3
Q7.	Describe the effectiveness of the various components in a dynamic positioning system, and how they work together to maintain vessel position and heading.	10	CO3

Q8.	Enumerate the components and functions of the marine riser in an offshore rig.	10	CO3

SECTION-C
(2Qx20M=40 Marks)

Q8.	Analyze the step-by-step process involved in the installation of a jack-up offshore mobile unit and create detailed illustrations of each stage. Or Evaluate the different types of well completion methods used in offshore drilling rigs. Additionally, analyze the role of Christmas trees in maintaining optimal flow rates and pressure.	20	CO4
Q9.	Explain the sequence of operations in drilling a well from floating rig. Describe in detail challenges in drilling a deep water well in an offshore environment. Or Investigate the effects of meteorological and oceanographic conditions on weather fronts and evaluate how these conditions can cause severe weather that impacts offshore operations.	20	CO4