

Name:
Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, July 2020

Course: Design of Floating Structures
Program: M. Tech. (Structural Engineering)
Course Code: CIVL 7020

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

Instructions: Do any one Question. Relevent codes, books and other reference materials may be used. Assume and state clearly, any data considered necessary but missing.

| S. No. | | Marks | CO |
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| Q 1 | <p>A cell spar offshore platform produces crude oil at a rate of 6 lac barrels per day. A tanker shuttle vessal takes two days for a return loading/unloading trip from the spar to on-shore refinery. Determine the size of the spar well to be provided, over a multilayer hull of size 60x60m, assuming one third of the oil can be stored in the lower deck of the hull of spar platform.</p> <p>(a) If the total weight of the spar is 70000 t, determine the total length of the spar well for free floatation of platform with an air gap of 15m.</p> <p>(b) The soft tank portion of the spar is filled with stone ballast upto a height of 1m. Determine the length of the soft tank of spar platform. Assume density of stone ballast as 1600 Kg/m³.</p> <p>(c) If the tidal variations are 3m from MSL, what will the size of spar cylinder for operating condition.</p> | 100 | CO3 |
| Q 2 | <p>A Tension leg platform (TLP) having four legs is to be constructed in Arabian sea. The platform carries a hull of size 60 x 60m and has a</p> | 100 | CO4 |

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| | <p>weight of 60000 t. The legs of TLP have a diameter of 10m each .</p> <p>Assuming a suitable length of legs and configuration for the buoyancy tank, design the TLP for the following data:</p> <p>a. Air gap above MSL = 20m</p> <p>b. Tidal variations from MSL are 3.5m.</p> <p>c. The TLP can be hit by waves of height 2m.</p> <p>Also determine the following levels:</p> <ol style="list-style-type: none"> 1. Normal operation level 2. Alert level 3. Work suspension level | | |
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