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PRESIDENCY UNIVERSITY BENGALURU

SCHOOL OF ENGINEERING

MAKEUP EXAMINATION - JULY 2024

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| **Semester: VII** | **Date: 01/06/2024** |
| **Course Code: PET3003** | **Time: 1:30 PM-4:30PM** |
| **Course Name: Offshore Drilling and Petroleum Production Practices** | **Max Marks: 100** |
| **Program: B.Tech** | **Weightage: 50%** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3 parts.*
3. *Scientific and non-programmable calculator are permitted.*
4. *Do not write any information on the question paper other than Roll Number.*

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| **PART A** | | | |
| **ANSWER ANY 5 QUESTIONS 5Q X 4M=20M** | | | |
| 1 | Briefly explain the following term used in offshore (a) coastline(b) Continental shelf (c) abyssal plane. | (CO 3) | [Knowledge] |
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| 2 | Briefly explain the term Centre of Gravity & Centre of Buoyancy. | (CO 1) | [Knowledge] |
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| 3 | Recite the mission of the Bureau of Ocean Energy Management (BOEM). | (CO 1) | [Knowledge] |
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| 4 | Describe the use of Mat supported rig and spud cans based on operating conditions. | (CO 1) | [Knowledge] |
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| 5 | Describe the different types of riser system used for fixed and floating platforms. | (CO 2) | [Knowledge] |
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| 6 | Define the term meteorology and state the difference between weather and climate and describe why the weather condition are more crucial for offshore operations than the climate condition. | (CO 1) | [Knowledge] |
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| 7 | Briefly explain the working principle and design of semi-submersible rig in offshore applications. | (CO 3) | [Knowledge] |
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| **PART B** | | | |
| **ANSWER ANY 5 QUESTIONS 5Q X 10M=50M** | | | |
| 8 | Explain how dynamic positioning (DP) systems on offshore vessels work to maintain station-keeping and mitigate the effects of surge, sway, and yaw motions? | (CO 2) | [Comprehension] |
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| 9 | Define the term station keeping, and describe why is it crucial for offshore structures? Explain the primary methods used for station keeping in offshore environments. | (CO 2) | [Comprehension] |
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| 10 | Evaluate the primary advantages of concrete offshore structures over steel platforms in offshore oil and gas operations, focusing on factors such as maintenance requirements, cost-effectiveness, construction time, and storage capacity. | (CO 2) | [Comprehension] |
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| 11 | Demonstrate the concept of wave-structure interaction and its significance in the design and maintenance of coastal structures. | (CO 2) | [Comprehension] |
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| 12 | Illustrate the application of Gravity-Based Structures (GBS) in offshore operations, outlining their reasons for selection, and potential drawbacks. | (CO 2) | [Comprehension] |
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| 13 | Compare the workings of semi-submersible and drill ship rig on the basis of their operation, elaborate the advantages of drill ships over semi-submersible platforms. | (CO 3) | [Comprehension] |
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| 14 | Discuss the different Offshore drilling challenges and complexities that differ from onshore drilling operations. . | (CO 2) | [Comprehension] |
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| **PART C** | | | |
| **ANSWER ANY 2 QUESTIONS 2Q X 15M=30M** | | | |
| 15 | Compare and contrast semi-submersible, Gravity-Based Structure (GBS), Tension Leg Platform (TLP), and SPAR floating structures, focusing on their respective advantages and limitations. | (CO 3) | [Application] |
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| 16 | In the context of upstream oil and gas operations, demonstrate how surface production facilities play a crucial role in optimizing the efficiency and safety of the exploration, drilling, and development phases? Examine the challenges and opportunities associated with integrating wellheads effectively into offshore production facilities to maximize reservoir recovery and operational efficiency. | (CO 4) | [Application] |
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| 17 | Demonstrate the reasons for treating produced water in oil and gas operations, considering its diverse constituents and potential environmental impact. Assess different treatment methods and their effectiveness in meeting environmental standards while preserving operational efficiency. | (CO 4) | [Application] |
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