Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SET A

SCHOOL OF ENGINEERING
END TERM EXAMINATION - JAN 2024

Semester : Semester V -2021
Course Code : PET3004
Course Name : Advanced Well Engineering
Program : B.Tech.

Date : 10-JAN-2024
Time : 9:30AM - 12:30 PM
Max Marks : 100
Weightage : 50%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS **4 X 5M = 20M**

1. Define hydrostatic pressure. Also, state the difference between overbalance and underbalance condition.

(CO3) [Knowledge]

2. Describe primary function of BOP.

(CO3) [Knowledge]

3. Describe Tertiary Well control.

(CO3) [Knowledge]

4. Describe various reasons for well costing.

(CO4) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **5 X 10M = 50M**

5. Elaborate the concept of Swabbing and crucial factor encouraging swabbing.

(CO3,CO2) [Comprehension]

6. Estimate the hydrostatic pressure decrease when pulling **WET** pipe out of the hole:
Number of strands pulled = 10; Pipe displacement = 0.0055 bbl/ft; Average length per strand = 91 ft; Pipe Capacity = 0.01876 bbl/ft; Casing capacity = 0.0873 bbl/ft; Mud weight = 12.0 ppg

(CO3,CO1) [Comprehension]

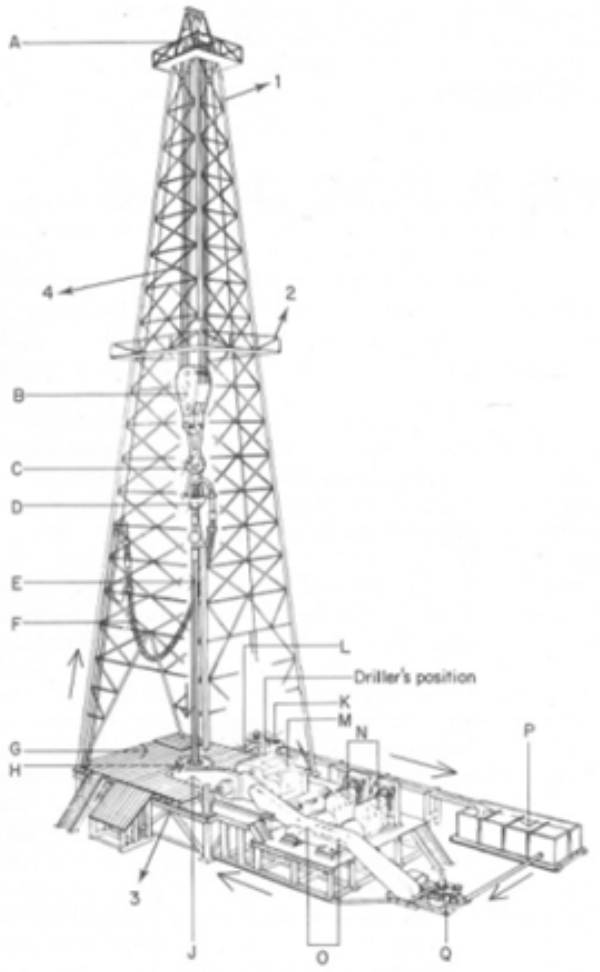
7. In the calculation of drilling costs, risk assessment is articulated in relation to the likelihood of achieving a specific target. There are three levels of risks: (a)P10 Estimate; (b) P50 Estimate; and (c) P90 Estimate. Explain all the types of Risk Estimates in drilling cost calculations.

(CO4) [Comprehension]

8. Explain non-productive time (NPT) in drilling operations and classify the various types of NPT.

(CO4) [Comprehension]

9. A drilling rig is a complex industrial structure designed for the exploration and extraction of natural resources, particularly oil and natural gas, from beneath the Earth's surface. The schematic diagram of the drilling rig and its components is provided below. Identify and briefly explain the function of the following components: (i) B, (ii) C, (iii) D, (iv) H, (v) P.



(CO2,CO1) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS **2 X 15M = 30M**

10. Inpetroleum industries, a "kick" refers to the unintended entry of formation fluids (such as oil, gas, or water) into the wellbore during drilling operations. This influx of formation fluids can lead to an uncontrolled increase in pressure within the well, posing significant risks to the drilling process, equipment, and personnel safety. A good drilling engineer is one who can deduce Warning signs and possible kick indicators at the surface. Elucidate the warning signs of Kick.

(CO3) [Application]

11. There are three main elements of the well cost. No matter what service or product is used, it will fall under one of the following three cost elements, namely: 1. Rig costs; 2. Tangibles; 3. Services. Illustrate all the types of well cost with respect to petroleum drilling operations.

(CO4) [Application]