Roll No. [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

PRESIDENCY UNIVERSITY
BENGALURU

School of Engineering
Mid - Term Examinations - November 2024

Semester: V   **Date**:8-11-2024

Course Code: PET3004   **Time**: 02:00pm – 03:30pm

Course Name: Advanced Well Engineering   **Max Marks**: 50

Program: B.Tech. (Petroleum Engineering)   **Weightage**: 25%

Instructions:
   (i) Read all questions carefully and answer accordingly.
   (ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2 marks.   **5Qx2M=10M**

1	Distinguish between onshore and offshore drilling operations.	2 Marks	L1	CO1
2	Define yield strength with respect to drill string design.	2 Marks	L1	CO1
3	Name the types of loading conditions that is subjected to drill pipe.	2 Marks	L1	CO1
4	Define pore pressure.	2 Marks	L1	CO2
5	State the formula for D Exponent.	2 Marks	L1	CO2

Part B

Answer ALL the Questions. Each question carries 10 marks.   **4Q x10M=40M**

6	The Hydrocarbon Exploration and Licensing Policy (HELP) functions to streamline and modernize India's approach to hydrocarbon exploration and production. Explain the functions of HELP.	10Marks	L2	CO1

<div align="center">Or</div>

7	Explain the functions of the following rig components:	10Marks	L2	CO1

   a) Derrick
   b) Drawworks
   c) Rotary Table
   d) Drill String
   e) Crown Block

| 8 | Find the weight carried by the top joint of the drill pipe if the drill string consist of 2 stand of Drill pipe (Average length 27 ft.) and 1 stand of Drilling collar (Average length of 31 ft). Consider nominal weight of the Drill Pipe and Drill Collar is 19.5 ppf and 22.6 ppf respectively. Given the mud use has density 9 ppg. | 10Marks | L3 | CO1 |

Or

| 9 | A drill string consists of 600ft of 8(1/4) in X 2 (13/16) in drill collars and the rest is a 5in, 19.5 lbm/ft Grade X95 drillpipe. If the required MOP is 100 000 lb and mud weight is 75pcf (10ppg), calculate the maximum depth of hole that can be drilled when using Class 2 drillpipe having a yield strength (Pt) of 394600 lb. | 10Marks | L3 | CO1 |

| 10 | In the provided diagram, the shale interval time response is plotted against depth, showing a significant deviation from the expected trend line. The logging method used to generate this trend needs to be identified. As a drilling engineer, analyze the data point located at "A" and determine the type of pressure present at this point. Provide a detailed explanation to support your analysis based on the observed deviation from the trend line. | 10Marks | L3 | CO1 |

Figure   Response Of Shale Point Acoustic Transit Time To Abnormal Pressure

Or
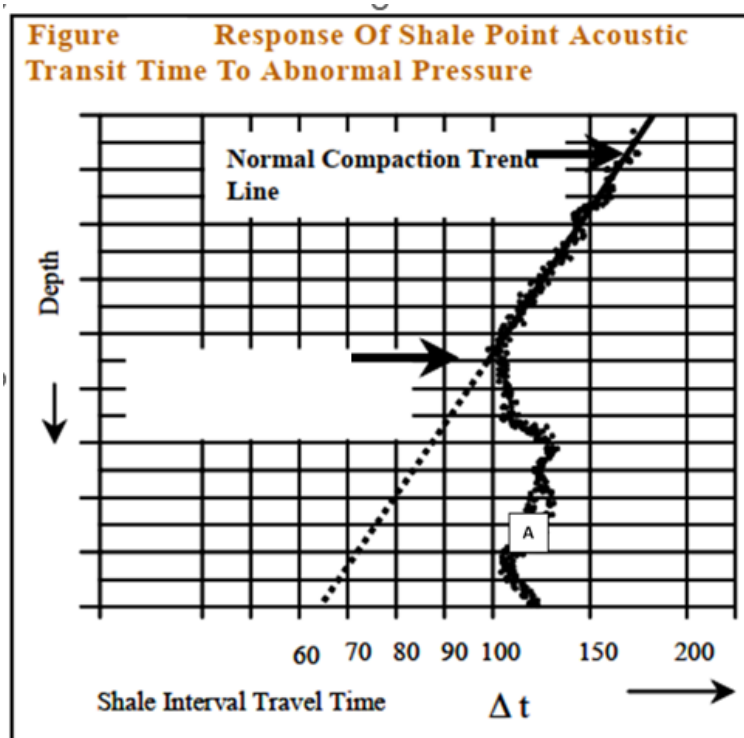
| 11 | A sonic log was run in a well at 8000 ft. The normal transit time (Δt_n) for this depth is 110 ms and from logs (Δt_0) is 130 ms. Calculate the pore | 10Marks | L3 | CO2 |

pressure at 8000 ft if the overburden pressure is 7,500 psi. Normal pore pressure gradient is 0.465psi/ft.

12	Elucidate Salt Diaparism concept in inducing abnormal pressure in the reservoir.	10Marks	L2	CO2

<div align="center">Or</div>

13	Undercompaction of shales is a major factor contributing to the development of abnormal pressure in subsurface formations. Explain the statement with proper justification.	10Marks	L2	CO2