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Department of Research & Development
Mid - Term Examinations - SEPTEMBER 2024

Odd Semester: Ph.D. Course Work	Date: 28 /09/2024
Course Code: PET5001	Time: 2:00pm – 3:30pm
Course Name: Advanced Petroleum Well Engineering	Max Marks: 50
Department: 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 5 marks.		4Qx5M=20M
1	Critically analyze the key factors influencing well trajectory planning and their long-term impact on reservoir performance and recovery efficiency.	5 Marks
2	Evaluate the environmental and safety challenges associated with well interventions and workover operations in ultra-deepwater or high-pressure/high-temperature (HPHT) environments.	5 Marks
3	Examine the role of automation and digitalization in transforming well design and drilling operations, with a focus on predictive analytics and machine learning integration.	5 Marks
4	Assess the contributions of advanced stress and pore pressure prediction models in optimizing wellbore stability under unconventional drilling conditions.	5 Marks

Part B

Answer ALL Questions. Each question carries 15 marks.		2QX15M=30M
5	A well is drilled to a depth of 10,000 ft with a pore pressure gradient of 0.50 psi/ft. The mud weight in use is 13.0 ppg, and the fracture gradient is 0.95 psi/ft. Determine the kick tolerance at this depth.	15 Marks
6	During MPD, the bottom-hole pressure (BHP) must be maintained at 4,500 psi. The hydrostatic pressure from the mud column is 4,000 psi, and the choke provides 200 psi of backpressure. Calculate the additional surface backpressure required to	15 Marks

	maintain the desired BHP if the mud weight decreases by 0.5 ppg. Assume the depth of the well is 10,000 ft.	
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