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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: PET5003	Time: 10:00am – 11:30am
Course Name: Sustainable Materials for Drilling Fluid Management	Max Marks: 50
Department: Petroleum Engineering Department	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	What is nanomaterial? Describe the different types of nanomaterial.	5 Marks
2	Describe the significant roles of size in nanomaterials.	5 Marks
3	Differentiate between Quantum Dot and Quantum wire. What are the impacts of these two in petroleum industry?	5 Marks
4	Describe the chemical routes for the synthesis of nanomaterials.	5 Marks

Part B

Answer ALL Questions. Each question carries 15 marks.		2QX15M=30M
5	Discuss about the function of quantum dots in the petroleum sector, emphasizing their special qualities and possible uses. Describe the applications of quantum dots in enhanced oil recovery (EOR), reservoir characterization, and exploration. Mention the difficulties of implementing them in oilfield operations as well.	15 Marks
6	Explain different processes used in Physical Vapour Deposition (PVD) and how it works. Describe the coating and surface modification processes utilised by PVD in the petroleum sector, specifically in relation to drilling and production instruments. Mention about the benefits and drawbacks of PVD use in oilfield applications.	15 Marks