

Name:	 UPES UNIVERSITY WITH A PURPOSE
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2019

Course: Petroleum Reservoir Modelling & Simulation
Program: M.Tech Petroleum Engineering
Course Code: PEAU 7007

Semester: II
Time 03 hrs.
Max. Marks: 100

Instructions: All questions are mandatory.

SECTION A

S. No.		Marks	CO
Q 1	Explain the reasons for performing a reservoir model study?	4	CO1
Q 2	Describe in general terms, the various simulation approaches?	4	CO2
Q 3	Describe in general terms, the comprehensive reservoir management model?	4	CO4
Q 4	Explain the applications of different simulation models?	4	CO5
Q 5	Why is history match not unique?	4	CO6

SECTION B

Q 6	Derive the mass conservation equation for three phase flow?	10	CO2
Q 7	a. Define Principle and Limitation of Material Balance Equation. What are the sources of data for use in Material Balance Equation? b. Define physical Model and Computer Model. What questions can a Computer model answer?	5+5	CO1 & CO3
Q 8	Define Gas Deviation Factor, and Productivity Index. Explain the Darcy's law to calculate the Productivity Index of well?	10	CO4
Q 9	What is Model initialization in simulation? What are the Model initialization techniques?	10	CO5
	(OR)		
	a) Discuss the major reasons for rapid development in Integrated reservoir modeling? b) Differentiate between Static and Dynamic reservoir model?	5+5	

SECTION-C

Q 10	<p>a. What are the objectives of History Matching? What are the uncertainties in History Matching? What sort of data should be match during history match?</p> <p>b. Cumulative oil production for a particular reservoir was 12.73×10^6 STB at the time when reservoir pressure was 750 psig. At the same time, cumulative production of solution gas was 3.05×10^9 SCF. Calculate the reservoir volume occupied by released gas. What is the remaining reservoir oil volume at 750 psig?</p> <p>Data: $N = 70.46 \times 10^6$ [STB] R_{si} at 1125 psig = 220 [SCF/STB] R_s at 750 psig = 162 [SCF/STB] B_g at 750 psig = 0.002505 [RB/SCF] B_o at 750 psig = 1.204 [RB/STB]</p>	10 + 10	CO6 & CO1
Q 11	<p>a. What are the types of reservoir based on fluid nature? What is Black Oil Model?</p> <p>b. What are the differences between the Classical and Numerical Simulation Methods?</p>	10 + 10	CO2 & CO5
	(OR)		
	<p>a. Discuss on various methods of forecasting reservoir performance?</p> <p>b. Illustrate the importance of reservoir simulation at appraisal and in mature fields?</p>	10 + 10	