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

Programme Name: M. Tech. Petroleum Engineering   **Semester** : III
Course Name : Oil/Gas Field Development   **Time** : 03 hrs.
Course Code : PEGS: 8002   **Max. Marks: 100**
Nos. of page(s) : 2
Instructions:
     a.   Answers must carry the supporting material such as equations and diagrams
     b.   Abbreviations used in the questions are standard and have their usual meaning
     c.   Make appropriate assumptions where data is not supplied

SECTION A		20 Marks	
S. No.		**Marks**	**CO**
Q 1	What are the definitions of Sedimentary Basin, Faults, Source Rock and Cap Rock?	4	CO1
Q 2	Define Migration, Entrapment of Hydrocarbons, Igneous and Metamorphic Rocks.	4	CO1
Q 3	Define Porosity, Permeability, Wettability, and Transition Zone with suitable Figure.	4	CO1
Q 4	Describe Aquifer, Isobar Map, Structure Contour Map and Demarcation.	4	CO1
Q 5	Define the Classification of Traps. Explain in detail with suitable figures.	4	CO1
SECTION B		**40 Marks**	
Q 6	Define the Delineation of structure. Write down the different steps for delineation of the structure through Flow Chart.	8	CO1
Q 7	Describe Basic Concepts of Oil and Gas Field Development Plan. Explain the essential steps for technological scheme of Oil and Gas Fields.	8	CO1
Q 8	What is Reserves? Write down the Objective and Time of Estimation of Reserves. Explain Probable Possible, Proved Reserves, Contingent and Prospective Resources.	8	CO2
Q 9	What is Drive Mechanism? Describe types of Drive Mechanism. Explain in detail each Drive Mechanism with suitable Figure and examples. **OR** Explain Direct Line Drive, Staggered Line Drive, Central Line Patterns and Well Spacing with suitable Figures.	8	CO3
Q 10	What is Net Present Value (NPV)? How to calculate NPV. Describe Sensitivity Analysis, Probability and Uncertainty.	8	CO4

	OR What is Risk Analysis? Write down the variables used in Risk. Write down the methods for Risk Analysis.		
	SECTION C	**40**	**Marks**
Q 11	What is the different Method for Estimating Oil & Gas Reserves? What are the Limitations of Volumetric Method? What are the use and significance of Material Balance Equation? What are the sources of data use in MBE? (Marks 10) Explain Hyperbolic Decline Curve analysis in detail. A well has an initial rate of 100 STB/D, initial decline rate, di, of 5% per month and Hyperbolic decline rate b=0.9. Calculate forecasting future production with Hyperbolic decline method for 5 years. (Marks 10)	**20**	**CO2**

Q 12	Describe Advantages and Limitations of Reservoir Simulation. What is the different File Section in eclipse data File? Write down the different keywords (in detail) used in Eclipse Sections. (Marks 20)
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	 OR
	
	 What are the steps in a Typical Reservoir Simulation Study? Write down the Output and Input Files in Black Oil IMEX Simulator of CMG. (Marks 10)
	
	 Set 10 cells to have length of 750 feet using **DX** keyword. (Marks 5)
	
	 Define a box as follows:
	
	        X direction - cell 1 to cell 10
	        Y direction - cell 1 to cell 10
	        Z direction - cell 1 to cell 1 (top layer only)
	
	 Set the depth below sea level of the tops of each cell in the box to 5,000 feet using the **BOX**, **TOPS** and **ENDBOX** keywords in Eclipse. (Marks 5)
		20	**CO5**