UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Sem Examination, DEC-2021

Programme Name: B.Tech Applied Petroleum Engineering (Upstream)   **Semester: V**
Course Name: Oil Field Development   **Time: 03 hrs**
Course Code: PEAU3024P (Program Elective 2)   **Max. Marks: 100**
Instructions:
  ➢ **All questions are compulsory.**
  ➢ **However, internal choice has been provided. You have to attempt only one of the alternatives in all such questions.**
  ➢ **Write the answers on an A4 sheet with your name and roll number mentioned on each page. Write clearly, scan and upload properly.**

SECTION A (4x5=20 Marks)
All Questions are compulsory

S. No.		Marks	CO
Q1	Write short notes on classification of traps.	**04**	**CO1**
Q2	Define oil and gas pool structure.	**04**	**CO2**
Q3	Define Marine riser and FPSO	**04**	**CO2**
Q4	Brief on Proved and Probable Reserves.	**04**	**CO1**
Q5	Define RF and EUR	**04**	**CO3**

SECTION B (40 Marks)
All the questions are compulsory

Q 6	Explain volumetric and material balance methods of reservoir evaluation. **OR** Explain the derivation of a general material balance equation for a typical oil reservoir.	**10**	**CO3**

Q 7	Discuss the potential sources of effect from construction, installation and pre commissioning of export facilities.	10	CO2
Q 8	Draw an offshore design and development process flowchart for oil field development and discuss.	10	CO3
Q 9	List out the factors that influence the level of uncertainty in the process of estimating oil and gas reserves. **OR** List out the various factors that influence depletion drive performance and its ultimate recovery.	10	CO2

SECTION-C (40 Marks)
All the questions are compulsory

Q 10	Given the following data for the Hout oil field in Saudi Arabia		
	Area $= 26,700$ acres Net productive thickness $= 49$ ft Porosity $= 8\%$ Average S_{wi} $= 45\%$ Initial reservoir pressure, p_i $= 2980$ psia Abandonment pressure, p_a $= 300$ psia B_o at p_i $= 1.68$ bbl/STB B_o at p_a $= 1.15$ bbl/STB S_g at p_a $= 34\%$ S_{or} after water invasion $= 20\%$ The following quantities will be calculated: 1. Initial oil in place 2. Oil in place after volumetric depletion to abandonment pressure 3. Oil in place after water invasion at initial pressure 4. Oil reserve by volumetric depletion to abandonment pressure 5. Oil reserve by full water drive 6. Discussion of results **.OR**	20	CO4
Q10	Explain the various reservoir drive mechanisms with neat sketch.		

Q11	**Given the following data for an oil field**		20	CO5

Volume of bulk oil zone
Volume of bulk gas zone = 112,000 acre-ft
Initial reservoir pressure = 19,600 acre-ft
Initial oil FVF = 2710 psia
Initial gas FVF = 1.340 bbl/STB
Initial dissolved GOR = 0.006266 ft₃/SCF
Oil produced during the interval = 562 SCF/STB
Reservoir pressure at the end of the interval = 20 MM STB
Average produced GOR = 2000 psia
Two-phase FVF at 2000 psia = 700 SCF/STB
Volume of water encroached = 1.4954 bbl/STB
Volume of water produced = 11.58 MM bbl
Water FVF = 1.05 MM STB
Gas FVF at 2000 psia = 1.028 bbl/STB
= 0.008479 ft₃/SCF

The following values will be calculated:

1. The stock tank oil initially in place.
2. The driving indexes.
3. Discussion of results.

OR

Q11

Discuss the Drive indexes for the material balance equations. A well has declined from 100 BOPD to 96 BOPD during a one month period. Assuming exponential decline, predict the rate after 11 more months and after 22.5 months. Also predict the amount of oil produced after one year.

All The Best !!