

Name:	
Enrolment No:	

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

Course: Reservoir Engineering	Semester: 1 Ac. year 2019-20
Program: M. Tech. (Petroleum Engineering)	Time 03 hrs.
Course Code: PEAU7002	Max. Marks: 100
Instructions: Assume any missing value.	

SECTION A

There are 5 Questions of 4 marks each, all questions are compulsory. (Short Answer less than 60 words)

S. No.	Statement of question	Marks	CO
Q 1	Differentiate between-Fracture Pressure Gradient & Litho-static Pressure Gradient.	4	CO1
Q 2	What is the information obtained from the static pressure measurements, if it is determined in the same well at different times?	4	CO2
Q 3	Complete the following sentence: If a well is located in a very large reservoir and producing at a constant rate, then the pressure disturbances are created in the reservoir and may be given as -----	4	CO3
Q 4	Indicate the different values of Pressure Gradients of various fluids existing in an Oil & Gas field.	4	CO3
Q 5	Enlist the four vital characteristics of Reserve estimations.	4	CO1

SECTION B

There are 4 Questions of 10 marks each, all questions are compulsory medium length(less than 150 words)

Q 1	Discuss the Tank Model and Volumetric Changes observed during the natural productive life of an oil reservoir as visualized in material balance Equation including the Concept, Assumptions and Features & Limitations. OR Describe material balance application to gas reservoirs. Also, discuss briefly the impact of water drive on a gas reservoir.	10	CO4
Q 2	Define Primary Drive Mechanisms and describe key points related production mechanisms of hydrocarbons.	10	CO5
Q 3	What are economic uncertainties? With the help of an example, Indicate their role in determining the Economic Rate of production.		CO4
Q 4	Reservoir Process Control System constitutes vital aspect in oil & gas field managements - describe its vitality in respect of Data Input(Collection & Generation) Data analysis & Data Out Put (classification)	10	CO2

SECTION-C

There are 2 Questions of 20 marks each, both are compulsory (long answers - not more than 400 words)

Q 1	<p>a) Calculate the original oil in place for an under saturated reservoir having an initial pressure of 5000 Pisa and initial oil formation volume factor of 1.305. The following data applies at 3350 Pisa ($P_b = 2750$ Pisa): $B_o = 1.330$, $\Phi = 10\%$, $S_w = 21.6\%$, $C_o = 1.5 \times 10^{-5} \text{ psi}^{-1}$, $C_f = 3 \times 10^{-7} \text{ psi}^{-1}$, $C_w = 3.5 \times 10^{-6} \text{ psi}^{-1}$ and $N_p = 1,510,000$ STB</p> <p>b) Calculate the yield up to bubble point pressure (2750 psia) if B_{ob} at bubble point pressure (2750 Pisa) is 1.350</p> <p>c) Project the reservoir performance when following additional reservoir data are available at a reservoir pressure of 1500 Pisa. $B_0 = 1.250$ $z = 0.90$ $T_f = 240^\circ\text{F}$ $R_{si} = 375$ SCF/STB $B_{ob} = 1.350$ (at 2750psia) $R_{sb} = 500$ SCF/STB $G_p = 3,732 \times 10^6$ SCF $N_p = 6,436,000$ STB</p> <p>d) Also, represent the application of Material Balance Equation for pictorial performance projection.</p>		CO5
Q 2	<p>Discuss the relevance of the following in hydrocarbon reservoir management:</p> <ul style="list-style-type: none"> a) Sequence of oil/gas field development b) Technological Scheme c) Initial development plan d) Final development plan <p><u>OR</u></p> <p>“Oil & Gas Field Development is the integration of technical achievements with established economic principles” Support the above statement through the OGF D approach and Development Strategy. Also, discuss main features of OGF D Plan and describe any field study.</p>		CO3