Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2020

Course: RESERVOIR ENGINEERING – II **Semester: VI, AcYear-2019-20**
Program: B. Tech (Applied Petro. Engg. with Gas Spl.) **Time: 03 hrs.**
Course Code: PEAU4014 **Max. Marks: 100**
Instructions: Assume any missing information. **Number of pages: -Two (2)**

SECTION A (20 MARKS)

THIS SECTION CONTAINS FIVE (5) QUESTIONS. ALL QUESTIONS ARE COMPULSORY

S. No.	Statement of question	Marks	CO
Q 1	Complete the following sentences: (i) In the depleted drive, the liberated gas will be segregating vertically only if ----------. (ii) The artificial gas cap will exists only if the injection of gas takes place at ----------. (iii) Volumetric Equation of Gas Engineering is useful for estimating gas at----------. (iv) In water drive reservoirs, the production mechanism is principally based on ----------.	4	CO1
Q 2	Enlist any four (4) favorable properties for oil recovery from an oil reservoir. The reservoir has Gravity- Drive mechanism.	4	CO1
Q 3	Indicate any four (4) Operations related with the time dependency of various operations effecting the life cycle of Oil & Gas fields.	4	CO2
Q 4	Discuss any four (4) Production forecast uncertainties of Oil Industry.	4	CO-2
Q 5	Describe briefly the Data Analysis Phase of Oil &Gas Field development	4	CO3

SECTION B (40 MARKS)

THIS SECTION CONTAINS FOUR (4) QUESTIONS. ALL QUESTIONS ARE COMPULSORY

S, No.	Statement of question	Marks	CO
Q 1	"Oil & Gas Field Development (OGFD) is a unique requirement of oil industry" Enlist the salient features of OGFD proposal.	10	CO4
Q 2	Write a brief note on Gas Well Monitoring with special reference to Deliverability and Gas Losses.	10	CO4

<table>
<tr><td>Q 3</td><td>Discuss the characteristics of Gas Cap Expansion Drive Mechanism and describe the essential conditions under which the modified material balance equation is used as performance prediction tool.</td><td>10</td><td>CO5</td></tr>
<tr><td>Q 4</td><td>In a water-drive oil reservoir, the aquifer is under a steady-state flowing condition with an estimated water influx constant of 130 bbl/day/psi. Calculate the cumulative water influx after 100, 200, 300, and 400 days
Following additional data may be used:
<table>
<tr><td>t, days</td><td>P, psi</td></tr>
<tr><td>0</td><td>3500 (p_i</td></tr>
<tr><td>100</td><td>3450</td></tr>
<tr><td>200</td><td>3410</td></tr>
<tr><td>300</td><td>3380</td></tr>
<tr><td>400</td><td>3340</td></tr>
</table>
OR
Calculate the drive Indices of a reservoir has been under water flooding and obtained following data after 500 days of water flooding:
W_e = 1,773 x 10^6 bbl. N_p = 1,559,000 STB P = 2264 Psi. G_p = 9,866 x 10^8 SCF.
The following reservoir parameters apply when the pressure is 2264 psi;
B_o = 1.308 B_g= 0.0008545 res. bbl. / STB, R_s = 612 SCF. /STB</td><td>10</td><td>CO6</td></tr>
<tr><td colspan="4">SECTION-C(40 MARKS)
THIS SECTION CONTAINS TWO (2) QUESTIONS. ALL QUESTIONS ARE COMPULSORY</td></tr>
<tr><td>S,No.</td><td>Statement of question</td><td>Marks</td><td>CO</td></tr>
<tr><td>Q 1</td><td>(a) Discuss the merits and de-merits of Volumetric and Material Balance Equation, especially when these are used are used at any stage of depletion of Gas Reservoir.
(b) A volumetric gas reservoir has the following production history and following data is also available:
<table>
<tr><th>Time, t
years</th><th>Reservoir pressure, p
psia</th><th>z</th><th>Cumulative production, G_p
MMMscf</th></tr>
<tr><td>0.0</td><td>1798</td><td>0.869</td><td>0.00</td></tr>
<tr><td>0.5</td><td>1680</td><td>0.870</td><td>0.96</td></tr>
<tr><td>1.0</td><td>1540</td><td>0.880</td><td>2.12</td></tr>
<tr><td>1.5</td><td>1428</td><td>0.890</td><td>3.21</td></tr>
<tr><td>2.0</td><td>1335</td><td>0.900</td><td>3.92</td></tr>
</table>
Φ=13% S_{wi} = 0.52% A= 1060 acres h = 54 ft. T 164 ° F
Calculate the gas initially in place volumetrically and from the MBE.</td><td>20</td><td>CO6</td></tr>
<tr><td>Q 2</td><td>Discuss depletion of Condensate Reservoir Under any two following conditions;
(i) Natural depletion (ii) Injection of gas (iii) Water drive
OR
Discuss the Economic Share and Operational Activities related to hydrocarbon reservoir management.</td><td>20</td><td>CO6</td></tr>
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