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

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2021

Course: **Oil/Gas Field Development**	**Semester** **: III**
Program: **M. Tech. PE**	**Time** **: 03 hrs.**
Course Code: PEGS: 8002	**Max. Marks: 100**

SECTION A
1. All 5 Questions are compulsory. Each Question will carry 4 Marks
2. Instruction: Write short Answer
(Scan and upload) **(5Qx 4M = 20 Marks)**

Sl. No.	Question	Marks	COs
Q 1	Define appraisal well, discovery well, development well and migration.	4	CO1
Q 2	Define generation of hydrocarbon, source rock, cap rock and sedimentary basin.	4	CO1
Q 3	Explain basics of Oil and Gas field development plan.	4	CO1
Q 4	Define contour map, isobar map, delineation of structure and trap.	4	CO1
Q 5	Define reserves. Describe time of estimation and list types of reserves.	4	CO2

SECTION B
1. Attempt 4 Questions. Each Question will carry 10 marks. Question 4 has internal choice.
2. Instruction: Write medium answer.
(Scan and upload) **(4Qx10M = 40 Marks)**

Q 6	A. Explain volumetric method. Write down the formula to calculate initial gas in place by volumetric method. **(5 Marks)** B. Calculate the initial gas in place from the given data of gas field: Area = 160 acres Net productive thickness = 40 ft. Porosity = 22% Connate water saturation S_{wc} = 23% Bg at pi = 0.00533 ft3/SCF **(5 Marks)**	10	CO2
Q 7	A. Describe decline curve analysis. Illustrate the different types of decline curve analysis. **(5 Marks)**	10	CO2

	B. Define principle of material balance equation (MBE). Discuss the sources of data for use in MBE. **(5 Marks)**		
Q 8	Describe **a**dvantages and **l**imitations of **r**eservoir **s**imulation. Explain input and output files in **b**lack **o**il IMEX **s**imulator of CMG. Write down the names of modeling software for **s**tatic and dynamic modeling.	**10**	**CO5**
Q 9	Explain the factors required for field development plan. Define the important stages in the life of an oil field. Identified the issues related to technological scheme. **OR** Describe Rational Field Development of reservoir. Explain different studies during the rational development of reservoir.	**10**	**CO4**

SECTION-C

1. Attempt 2 Questions. Each Question carries 20 Marks. Question 2 has internal choice
2. Instruction: Write long answer.

(Scan and upload)   **(2Qx 20M = 40 Marks)**

Q 10	A. Define drive Mechanism. Write down the correlations to estimate oil recovery factors under solution gas drive (API Study) and water drive (API Study) and Guthrie-Greenberger study. **(10 Marks)** B. Explain well spacing, different rule of well spacing, direct Line drive, staggered line drive and central line pattern with suitable figures. **(10 Marks)**	**20**	**CO3**
Q 11	A. Describe portfolio management, return on investment (ROI), payback period, internal rate of return (IRR) and risk analysis. **(10 Marks)** B. Calculate the payback period for the cash flows given as below: <table><tr><th>Year</th><th>Cash flow ($)</th></tr><tr><td>0</td><td>-50,000</td></tr><tr><td>1</td><td>30,000</td></tr><tr><td>2</td><td>20,000</td></tr><tr><td>3</td><td>10,000</td></tr><tr><td>4</td><td>5,000</td></tr></table> Absolute value of NCF in that year Payback period= [Last year with a negative NCF] + -- Total cash flow in the following Year **(10 Marks)**	**20**	**CO4**

	OR
	
	A. Describe net present value (NPV). If any investment done in a project and invested as follows:
	
	      $100 1st Year
	      $200 2nd Year
	      $300 3rd Year
	
	Calculate NPV with discount rate of 9%. **(10 Marks)**
	
	B. Describe sensitivity analysis and tornado plot with examples. Explain the advantages and disadvantages of decision tree. **(10 Marks)**		