UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Online End Semester Examination, December 2020

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

SECTION A
1. Each Question MCQ/TF will carry 5 Marks
2. Instruction: Select the correct answer(s)

Sl. No.	Question	CO
Q 1	A. The movement of hydrocarbons through the carrier beds to the reservoir is known as _____. a) Primary migration b) Secondary migration c) Tertiary migration d) Primary & Secondary migration B. Rock Formed from the materials of older rocks by the actions of erosion, transportation and deposition. (Mechanical process). Such as conglomerate, sandstone, shale is called _____. a) Igneous Rocks b) Metamorphic Rocks c) Clastic Rocks d) Non-Clastic Rocks C. A fault that shows relative downward displacement of hanging wall is termed as _ _____ a) Reverse Fault b) Normal Fault c) Strike Slip Fault d) None of the above	CO1

	D. A fault that shows sidewise displacement of hanging wall is termed as a) Strike Slip Fault b) Reverse Fault c) Normal Fault d) None of the above E. Isopay map is prepared by obtaining difference in elevation between a) Gas-Water contact and the top of the hydrocarbon-bearing zone b) Oil-Water contact and the top of the hydrocarbon-bearing zone c) Both (a) and (b) d) None of the above	
Q 2	A. Material Balance is a powerful tool that helps determine the _____. a) Reserves b) Recovery Factor c) Drive Mechanism d) All of the above B. The ratio of the actual path length to the straight path length is called_____. a) Tortuosity b) Length ratio c) Both Tortuosity and Length ratio d) None of the above C. Permeability depends on _____. a) Internal surface of the pore space b) Distribution of the pore throat sizes c) Tortuosity of the fluid flow paths d) All of the above D. Porosity of a rock depends on _____. a) Size and shape of the grains b) Nature of packing c) Presence and absence of vugs and fractures d) All of the above	**CO2**

	E. Material Balance equation first presented by Schilthuis in _____ a) 1936 b) 1958 c) 1946 d) 1931	
Q 3	A. Proven reserves are those reserves claimed to have a reasonable certainty (normally at least 10% confidence) of being recoverable under existing economic and political conditions, with existing technology. (True/False) B. A decline curve of a well is simply a plot of the well's production rate on the y-axis n versus time on the x-axis and when the data plots concave downward, it is modelled with a "hyperbolic decline". (True/False) C. Degree of uncertainty in reserves estimation not affects the oil production profile, (True/False) D. Reserve estimate are dynamic in nature and the accuracy and confidence level not depends on quality and quantity of the data. (True/False) E. Clays and shales are usually richer in radioactive material than other sedimentary Rocks. (True/False)	**CO2**
Q 4	A. Oil Recovery in Water Drive oil reservoirs is a) 5 to 30% of OOIP b) 15 to 50% of OOIP c) 30 to 60% of OOIP d) 16 to 85% of OOIP B. Alternating lines of producers and injectors and can be either direct or staggered is Called a) Seven Spot b) Line drive c) Inverted seven spot d) Five spot C. Fluid Viscosity" is a major determinant of well spacing, Heavy – oil fields may be drilled as tightly as a) One – Four Acre per well b) One – Half Acre per well c) One-Six Acre per well d) One Acre per well	**CO3**

D. Well spacing in gas reservoir is _____ .

    a) Narrow
    b) Very wide
    c) Medium
    d) All of them

E. The objective (s) of well testing is:

    a) To evaluate formation permeability
    b) To evaluate wellbore damage
    c) To evaluate static reservoir pressure
    d) All of them

Q 5	A, Productivity Index can be mathematically expressed as _____ ,
	
	   a) Production x Drawdown
	   b) Production/Drawdown
	   c) Production-Drawdown
	   d) Drawdown/ Production
	 B. The distance between the rotary table to the end of well is called _____ ,
	
	   a) True subsea depth
	   b) Measured depth sub sea
	   c) True vertical depth
	   d) Measured depth
	 C. Petroleum projects often have long time horizons covering more than 20 - 30 years Depending on amount of _____ .
	
	   a) Extractable reserves
	   b) Production rates
	   c) Economic considerations
	   d) All of them
	
	 D. The Recovery factor is
	
	   a) A ratio of the OOIP to the amount of oil in the reservoir at the economic limit
	   b) A ratio of the OOIP to the amount of gas in the reservoir at the economic limit Possible
	   c) A ratio of the OOIP to the amount of total reserves in the reservoir at the economic limit Possible
	   d) None of the above
		CO4	

	E. The "Developmental Plan" based on meager data available from a few wells drilled as a) Exploratory wells b) Development wells c) Appraisal Wells d) None of them	
Q 6	A. Comparison ratio of the money gained or lost on an investment to the amount of money Invested is known as a) Pay Back period b) Return on Investment c) Expected Monetary Value d) All of the above B. Consequences of hazard is known as a) Risk b) Probability c) Uncertainty d) None of them C. Profitability Index" or "Discounted Profit – to - Investment Ratio" is also known as a) Probability b) Present Value Index c) Infernal Rate of Return d) Expected Monetary Value D. The range of possible outcomes for an event is known as a) Uncertainty b) Probability c) Risk d) None of them E. The method for combining profitability estimates of risk and uncertainty to yield a risk-adjusted decision criterion is known as a) NPV b) IRR c) EMV d) All of them	**CO5**

1. Each question will carry 10 marks
2. Instruction: Write short / brief notes

Q 7	A. Define Generation of Hydrocarbon, Delineation of Structure, Sedimentary Rock, Cap Rock and Source Rock. B. Explain Wild Cat well, Discovery well, Exploratory well, Appraisal well and Development Well.	CO1
Q 8	A. Define principle of Material Balance Equation, Explain assumptions and advantages of using MBE. B. Define Reserves. Describe Objective, Time of Estimation and types of Reserves.	CO2
Q 9	A. Explain well spacing, Different rule of well spacing, direct line drive, staggered line drive and central line drive Pattern. B. Define Types of Drive Mechanism and explain each Drive Mechanism in detail.	CO3
Q 10	Define Rational Field Development of reservoir. Explain different studies during the rational development of reservoir.	CO4
Q 11	A. Explain Time Value of Money, Internal Rate of Return (IRR), Tornado Plot, Sensitivity Analysis and Risk Analysis. B. Explain Net Present Value (NPV). Portfolio Management, OPEX, CAPEX and Decision Tree Analysis.	CO5

SECTION-C

1. Each Question carries 20 Marks.
2. Instruction: Write long answer.

Q 12	Describe Advantages and Limitations of Reservoir Simulation. Explain the different deliverables for Geo-cellular modeling in Petrel. Write down the names of modeling software for Static modeling. Explain input and output files in Black Oil IMEX Simulator of CMG. **OR** Describe different File Sections in eclipse data File. Write down the different keywords (in detail) used in Eclipse Sections Define a box as follows: X direction - cell 1 to cell 5 Y direction - cell 1 to cell 5 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 8,000 feet using the **BOX**, **TOPS** and **ENDBOX** keywords in Eclipse.	CO5