



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, Dec., 2021

Course: Economics & Risk Management in Oil & Gas Industry
Program: M.Tech. PE
Course Code: PEGS 7024P

Semester: I
Time: 3 hrs.
Max. Marks: 100

SECTION A		(4M× 5Q = 20 Marks)
Each Question carries 4 Marks		
Q.1	Illustrate with a simple model the Flow of Funds for an investment opportunity of an oil field development Project.	CO1
Q.2	State the differences between Depreciation and Amortization.	CO3
Q.3	What is Salvage value? Supplement your answer with an example.	CO3
Q.4	Why money has time value?	CO4
Q.5	Define Stage Gate Process. How do you categorize the common stage gate process for an oil and gas plant?	CO5
SECTION B		(10M × 4Q = 40 Marks)
1. Each question carries 10 marks		
2. Instruction: Write short / brief notes		
Q.1	(a) Explain Units of Production depreciation method . (b) An Oil company installs a crude oil processing plant costing \$25 million with an estimated capacity to produce 75 million barrels of crude oil during its entire life. Production during first year of operation is 5 million barrels and expected residual/ salvage value is \$2 million. Calculate the Units of Production depreciation.	CO3
Q.2	Calculate the net cash flow for just 1 year of an oil and gas project. Consider the following assumption in that particular year as : Production = 25MMbbl , Oil price = \$100/bbl, Royalty rate = 12% , Tax rate = 35%, CAPEX = \$100 Million, OPEX = \$25 Million (Assume that previous CAPEX was \$125 million with <u>25% straight line capital allowance</u>).	CO2

Q.3	<p>An investment of \$200,000 in the oil and gas project is expected the following cash inflows in six years.</p> <p>Year 1 : \$70,000 Year 2 : \$60,000 Year 3 : \$55,000 Year 4 : \$40,000 Year 5 : \$30,000 Year 6 : \$25,000</p> <p>Compute the Pay Back Period of the investment. Should the investment be made if a company wants to recover the initial investment in 3 years or less?</p>	CO4
Q.4	<p>Illustrate the impacts of Geological Risks and human capital risks on hydrocarbon industry and also demonstrate the ways to mitigate them.</p> <p style="text-align: center;">OR,</p> <p>Define Sensitivity analysis. How will you perform sensitivity analysis of a potential field development considering base case of NPV as \$100 million?</p>	CO5
<p>Section C</p> <p>1. Each Question carries 20 Marks. 2. Instruction: Write long answer.</p>		<p>(20M×2Q = 40 Marks)</p>
Q.1	<p>(a) Classify the legal arrangements that are present in the petroleum industry.</p> <p>(b) Illustrate in details the key features of the legal systems that have been developed to address the rights and obligations of host Govt. and of private investors in the petroleum industry.</p>	CO6
Q.2	<p>(a) Define Qualitative Risk Analysis and state its objectives</p> <p>(b) Describe in detail Delphi technique, Root Cause analysis, SWOT analysis that are followed in the risk management process in the hydrocarbon industry.</p> <p style="text-align: center;">OR,</p> <p>(a) Explain the term risk management.</p> <p>(b) Illustrate the risk assessment matrix models for Qualitative and Quantitative risk analysis that are used for monitoring, prioritizing and developing action plans for managing risks in the oil and gas projects.</p>	CO5