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| **Name:**<br>**Enrolment No:** | |

**UPES**

**End Semester Examination, December 2024**

**Course:** Economics and Risk Management in Oil and Gas Industry — **Semester: I**

**Program:** M. Tech (Petroleum Engineering) — **Time: 03 hrs**

**Course Code:** PEAU7024 — **Max. Marks: 100**

**Instructions:**

a) Read all the questions carefully
b) There are no options or choices and all the questions are compulsory
c) Calculators can be used for arithmetic's only
d) Perform the rough work besides the answers for more clarity and preciseness.
e) While solving problems adopt a stepwise approach and label/highlight the step numbers involved and the result.

**SECTION A (5Q x 4M = 20 Marks)**

| S. No. | Statement (s) of the question (s) | Marks | CO |
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| Q1 | Mention basic principles of development of Petroleum Economics. | 4 | CO1 |
| Q2 | Explain the impacts of geopolitical instability on the profitability of the Oil and Gas Industry. | 4 | CO1 |
| Q3 | Elucidate the factors affecting NPV in an Oil and Gas Industry. | 4 | CO2 |
| Q4 | Define risk matrix. Explain this with suitable examples. | 4 | CO2 |
| Q5 | Describe sensitivity analysis with suitable examples. | 4 | CO3 |
| **SECTION B (4Q x 10M = 40 Marks)** | | | |
| Q6 | Describe the various strategies that companies adopt to handle cash flow during periods of low oil prices. | 10 | CO2 |
| Q7 | Describe Straight-line depreciation method. Explain with an example. State its advantages and disadvantages. | 10 | CO2 |
| Q8 | Consider Aramco as an Significant Investor in O&G sector with a special interest in Oil refinery with the following details<br>Project: Aramco's investment in a new oil refinery.<br>Initial Investment: $2 billion.<br>Possible Outcomes:<br>Low Demand: Low market demand for refined products.<br>• Probability: 25%<br>• Monetary Value: -$600 million (loss)<br>Moderate Demand: Average market demand. | 10 | CO4 |

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| | • Probability: 40%<br>• Monetary Value: $200 million (profit)<br>High Demand: High market demand.<br>• Probability: 15%<br>• Monetary Value: $2 billion (profit)<br>Calculate the Expected Monetary Value (EMV) and discuss the results. | | |
| Q9 | Describe the various stages for the Overall flow of funds for a project in Petroleum Engineering. | 10 | CO3 |
| **SECTION C (2Q x 20M = 40 Marks)** | | | |
| Q10 | Describe decommissioning as a critical phase in an Oil and Gas Industry. Enumerate the various methods for decommissioning with suitable examples. | 20 | CO4 |
| Q11 | Chevron as an major Oil and gas project executive has the following project specifications<br>Initial Investment: $10 million<br>Project Life: 5 years<br>Annual Cash Flows:<br>Year 1: $2.51 million<br>Year 2: $4.25 million<br>Year 3: $7.33 million<br>Year 4: $11.46 million<br>Year 5: $16.56 million<br>Discount Rate: 10%<br>Calculate the a) Net Present Value (NPV), b) Internal Rate of Return (IRR), and c) Payback Period for the project. | 20 | CO3 |