


<b>Name:</b> <b>Enrolment No:</b>	
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**UPES**  
**End Semester Examination, December 2023**

**Program Name: M.Tech. PE** **Semester : I**  
**Course Name: Economics & Risk Management in Oil and Gas Industry** **Time : 3 hrs**  
**Course Code: PEAU 7024** **Max. Marks : 100**  
**Nos. of page(s): 03**

**Instructions: All Questions are compulsory. In section B, Question No. 9 has internal choice to attempt anyone. Similarly, in section C, Question No.10 has internal choice to attempt anyone.**

**SECTION A**  
**(5Qx4M=20Marks)**

S. No.		Marks	CO
Q.1	Define the three periods characterized by the oil and gas production phase.	[4 Marks]	CO1
Q.2	List four objectives for application of risk management techniques for oil and gas projects.	[4 Marks]	CO1
Q.3	Outline the role of depreciation in cash flow analysis.	[4 Marks]	CO2
Q.4	Explain Depreciation and Amortization with examples.	[4 Marks]	CO2
Q.5	Appraise the advantages and disadvantages of pay back period method	[4 Marks]	CO3

**SECTION B**  
**(4Qx10M= 40 Marks)**

Q.6	<p>A company requires an initial investment of Rs. 40,000. The estimated net cash flows are as below:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Year</th> <th style="width: 85%;">Net Cash Flows (in Rupees)</th> </tr> </thead> <tbody> <tr><td>1</td><td>7000</td></tr> <tr><td>2</td><td>7000</td></tr> <tr><td>3</td><td>7000</td></tr> <tr><td>4</td><td>7000</td></tr> <tr><td>5</td><td>7000</td></tr> <tr><td>6</td><td>8000</td></tr> <tr><td>7</td><td>10,000</td></tr> <tr><td>8</td><td>15,000</td></tr> <tr><td>9</td><td>10,000</td></tr> <tr><td>10</td><td>4000</td></tr> </tbody> </table> <p>Calculate the pay back period and evaluate whether the company should invest in the project considering 4 years as the cut off period.</p>	Year	Net Cash Flows (in Rupees)	1	7000	2	7000	3	7000	4	7000	5	7000	6	8000	7	10,000	8	15,000	9	10,000	10	4000	[10 Marks]	CO3
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Q.7	Assume that a Company purchases a second hand compressor for \$80,000 and spends \$ 25,000 on its cartage, repair and installation, the machine has an estimated useful life of 5 years and residual value of \$70,000. Compute annual depreciation and the rate of depreciation by Straight Line Depreciation method .	[10 Marks]	CO2
Q.8	Examine how Delphi Technique can be applied for qualitative risk analysis.	[10Marks]	CO4
Q.9	Analyze the impact of supply chain risk on oil and gas industry and also demonstrate the measures that the industry can adopt to mitigate this risk.  <b>OR,</b>  Analyze the impact of human capital risk on oil and gas industry and also demonstrate the measures that the industry can adopt to mitigate this risk.	[10 Marks]	CO4

**SECTION C**  
**(2Qx20M= 40 Marks)**

<b>Q.10</b>	<p>Estimate IRR of an oil and gas investment having initial cash outflow of US\$ 250,000. The cash inflows during the first, second, third and fourth years are expected to be US \$ 66,000, US \$78,000, US\$ 92,000 and US \$105,000 respectively. Assuming the cost of capital as 10%, take a decision for the management whether the investment should be made on the basis of IRR.</p> <p style="text-align: center;"><b>OR,</b></p> <p>Company A is considering two oil and gas projects. Project A and B require an initial investment of US\$ 1,500,000 and US\$ 3,000,000 respectively to yield estimated annual cash flows of :</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Project A</th> <th colspan="2" style="text-align: center;">Project B</th> </tr> </thead> <tbody> <tr> <td>Year 1</td> <td style="text-align: right;">\$ 150,000</td> <td>Year 1</td> <td style="text-align: right;">\$ 100,000</td> </tr> <tr> <td>Year 2</td> <td style="text-align: right;">\$ 300,000</td> <td>Year 2</td> <td style="text-align: right;">\$ 500,000</td> </tr> <tr> <td>Year 3</td> <td style="text-align: right;">\$ 500,000</td> <td>Year 3</td> <td style="text-align: right;">\$ 1000,000</td> </tr> <tr> <td>Year 4</td> <td style="text-align: right;">\$ 200,000</td> <td>Year 4</td> <td style="text-align: right;">\$ 1500,000</td> </tr> <tr> <td>Year 5</td> <td style="text-align: right;">\$ 600,000</td> <td>Year 5</td> <td style="text-align: right;">\$ 200,000</td> </tr> <tr> <td>Year 6</td> <td style="text-align: right;">\$ 500,000</td> <td>Year 6</td> <td style="text-align: right;">\$ 500,000</td> </tr> <tr> <td>Year 7</td> <td style="text-align: right;">\$ 100,000</td> <td>Year 7</td> <td style="text-align: right;">\$ 1000,000</td> </tr> <tr> <td colspan="2" style="text-align: center;"><b>Cost of capital @10%</b></td> <td colspan="2" style="text-align: center;"><b>Cost of capital @13%</b></td> </tr> </tbody> </table> <p>Company A is only able to undertake one project. Evaluate the two projects and take a decision for the company which project to be invested using the profitability index method.</p>	Project A		Project B		Year 1	\$ 150,000	Year 1	\$ 100,000	Year 2	\$ 300,000	Year 2	\$ 500,000	Year 3	\$ 500,000	Year 3	\$ 1000,000	Year 4	\$ 200,000	Year 4	\$ 1500,000	Year 5	\$ 600,000	Year 5	\$ 200,000	Year 6	\$ 500,000	Year 6	\$ 500,000	Year 7	\$ 100,000	Year 7	\$ 1000,000	<b>Cost of capital @10%</b>		<b>Cost of capital @13%</b>		[20 Marks]	CO3
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Q.11	Examine the diagramming techniques of qualitative risk analysis between Cause and effect diagrams and Influence diagrams. Illustrate your answer with suitable figures.	<b>[20 Marks]</b>	<b>CO4</b>
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