

Name:	
Enrolment No:	

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**

**End Semester Examination, December 2021**

<b>Program Name : M.Tech. – Energy System+ Renewable Energy Engg</b>	<b>Semester : III</b>
<b>Course Name : Project &amp; Financial Management in Energy Sector</b>	<b>Time : 03 hrs.</b>
<b>Course Code : EPEC 8010</b>	<b>Max. Marks : 100</b>

**SECTION A**

1. Each question carry 5 marks
2. Instructions : Complete the statement / Select the correct answer(s) 5 x 4

	Question	CO
<b>Q 1</b>	Describe the various phases of a project life cycle	CO1
<b>Q 2</b>	Explain the “Change Management” in a project	CO1
<b>Q 3</b>	Illustrate the advantages and disadvantages of CPM and PERT	CO2
<b>Q 4</b>	Describe the types of WBS	CO2
<b>Q 5</b>	Illustrate the various stakeholders of a roof top Solar PV project	CO2

**SECTION B**

1. Each question carry 10 marks
2. Instructions : Write short / brief notes 4 x 10

<b>Q 6</b>	Explain the Risk Management of a Big solar PV plant as an IPP	CO1												
<b>Q 7</b>	<p>The following are the cash flows for a simple insulation upgradation project.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th style="width: 15%;">YEAR</th> <th style="width: 15%;">0</th> <th style="width: 15%;">1</th> <th style="width: 15%;">2</th> <th style="width: 15%;">3</th> <th style="width: 15%;">4</th> </tr> </thead> <tbody> <tr> <td>Cash flow</td> <td style="text-align: center;">-18,000</td> <td style="text-align: center;">-5,000</td> <td style="text-align: center;">10,000</td> <td style="text-align: center;">10,000</td> <td style="text-align: center;">10,000</td> </tr> </tbody> </table> <p>a) Calculate the NPV if the cost of capital or discount rate is 8% b) Calculate the IRR</p>	YEAR	0	1	2	3	4	Cash flow	-18,000	-5,000	10,000	10,000	10,000	CO3
YEAR	0	1	2	3	4									
Cash flow	-18,000	-5,000	10,000	10,000	10,000									

Q 8	<p>The details of activities for a pump replacement project is given below:</p> <p>a) Draw a PERT chart  b) Find out the duration of the project  c) Identify the critical path.</p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Immediate Predecessors</th> <th>Time (days)</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>-</td> <td>2</td> </tr> <tr> <td>B</td> <td>A</td> <td>2</td> </tr> <tr> <td>C</td> <td>B</td> <td>4</td> </tr> <tr> <td>D</td> <td>C</td> <td>6</td> </tr> <tr> <td>E</td> <td>C</td> <td>3</td> </tr> <tr> <td>F</td> <td>C</td> <td>5</td> </tr> <tr> <td>G</td> <td>D, E, F</td> <td>9</td> </tr> <tr> <td>H</td> <td>G</td> <td>8</td> </tr> </tbody> </table>	Activity	Immediate Predecessors	Time (days)	A	-	2	B	A	2	C	B	4	D	C	6	E	C	3	F	C	5	G	D, E, F	9	H	G	8	CO2
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Q 9	Compare the various kind of performance contracting used in energy efficiency projects.	CO4																											
<b>SECTION-C</b>																													
<p><b>1. Question carries 20 Marks.</b>  <b>2. Instruction: Write long answer</b></p>		<b>2 x 20</b>																											
Q 10	<p>It is proposed to install at the beginning of the year a heat recovery equipment in a food processing industry. The capital cost of the equipment is Rs 20,000/-. The savings accrued by the unit are constant and Rs 5,000/- annually. The discount rate is 25%.</p> <p>(i) Calculate the Net Present Value (NPV) for 5 years.  (ii) Is the investment recovered after 5 years? Explain!  (iii) Is the investment recovered after 7 years? Explain!  (iv) Estimate the IRR for this investment after 7 years if the salvage value of the equipment is Rs 2,000 at the end of 7th year.</p>	CO3																											
Q 11	Compare various type of Measurement and Verification (M & V) techniques used for evaluation of an ESCO project. Which one is most suitable for the M&V of ESCO project of Replacement of existing Fluorescent tube lights of block 3 of UPES with the LED lights.	CO4																											