Name: Enrolment No:	

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

Course: Project & Financial Management in Energy Sector   Semester: I
Program: M. Tech- ESS   Time 03 hrs.
Course Code: EPEC 7005   Max. Marks: 100

SECTION A

1. Each Question will carry 4 Marks
2. Instruction: Complete the statement / Select the correct answer(s)

S. No.		Marks	CO
Q 1.	Illustrate the 4 most important considerations required for determining the 'Cash Flow' of a project.	4	CO1
Q 2.	a) In a 'Fluidized Bed Combustion Boiler', _____ is used to maintain the ignition temperature & effective mixing of fuel. b) In a Run-off, the river (High Velocity & Low Volume), type Hydroelectric Power Plant, _____ type of turbine is more commonly used. c) A 'Pressurized Water Reactor' based Nuclear Power Plants comprises of _____ cycle. d) For a Wind Turbine to operate under wind flowing from various direction _____ Axis type of Wind Turbine is preferable.	4	CO1
Q 3.	An annual maintenance & retrofitting of a Thermal Power Plant costing Rs. 200,000 is expected to provide an after tax cash flow of Rs. 25,000/- over a period of 6 years, without any significant annual fluctuations. Calculate the 'Return on Investment (ROI)'.	4	CO2
Q 4.	Identify at least 2 advantages & 2 dis-advantages between 'Debt Financing' & 'Equity Financing'.	4	CO1
Q 5.	Calculate the 'Most Likely Time' of an activity having the 'Expected Time = 19', 'Optimistic Time = 15 Days' & 'Pessimistic Time = 27 days'.	4	CO2

SECTION B

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

Q 6.	Illustrate the steps involved in the preparation of a 'Detailed Project Report (DPR) 'for a 10 MW Wind Turbine Power Plant.	10	CO3
Q 7.	Explain the Project Management Life Cycle steps involved in the design & construction of a 'Topping Cycle 25 MW Biomass based Co-generation Thermal Power Plant along with a Sugar Mill'.	10	CO2
Q 8.	Compare & contrast between 'Shared Saving' and 'Guaranteed Saving' 'Energy Performance Contracting'.	10	CO3
Q 9.	An ESCO company is required to invest in a waste heat recovery project, which is expected to yield an annual saving of Rs.10,00,000 and the life of the equipment is 7 years. If the ESCO expects 30% IRR on this project, calculate the investment required to be made.	10	CO3

<div align="center">**OR**</div>

An industry intends to invest Rs. 5,00,000 in a new energy saving project.
The cash flows expected are:
Year 1 : Rs.2,00,000
Year 2 : Rs.3,00,000
Year 3 : Rs.2,00,000

The expected return is 10%. Evaluate the Net Present Value and comment on the feasibility of the project.

<div align="center">**SECTION-C**</div>

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

Q 10.	The details of activities for a Plant construction project is given below:

a) Draw a PERT chart
b) Find out the duration of the project
c) Identify the critical path.

Activity	Immediate Predecessors	Time (Days)
A	-	1
B	A	2
C	B	4
D	C	6
E	C	3
F	C	5
G	D, E, F	8
H	G	7

<div align="center">**OR**</div>

For the following tasks, durations, and predecessor relationships in the following activity table,

20   **CO4**

Activity Description	Immediate Predecessor(s)	Optimistic (Weeks)	Most Likely (Weeks)	Pessimistic (Weeks)
A	-	2	4	12
B	-	10	12	26
C	A	8	9	10
D	A	10	15	20
E	A	7	7.5	11
F	B,C	9	9	9
G	D	3	3.5	7
H	E,F,G	5	5	5

Using the PERT method,
   a) Draw the network
   b) Calculate expected time for all tasks

c) Calculate variance for all tasks	
d) Identify the critical path	

Q 11.	The cash flows in two different energy conservation projects are given in the table below. Please help the management of an infrastructure company to decide which project to invest in as the management is interested in investing in only one project. The company is likely to consider any project which gives a minimum return on investment of 18%. Please justify your choice.	20	CO4

Investment	Project- A		Project- B	
	17,50,000/-		12,00,000/-	
Year	Expenses	Savings	Expenses	Savings
1		4,00,000		4,50,000
2		4,00,000		4,00,000
3		4,00,000		3,50,000
4		4,00,000		3,00,000
5	1,00,000	6,00,000		2,50,000
6		6,00,000		2,00,000
7		6,00,000		1,16,650
8		3,80,300		