Name: Enrolment No:	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2021

Program Name : M.Tech. – Energy System **Semester : III**
Course Name : Process Optimization **Time : 03 hrs.**
Course Code : EPEC 7014 **Max. Marks : 100**

SECTION A

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

	Question	CO
Q 1	Elaborate the factors for reducing the electrical power losses in network	CO1
Q 2	Calculate the capacitor size for improving the power factor to 0.99 from 0.7 at a load of 100 kW. What are the other benefits of improving Power Factor?	CO1
Q 3	Describe the value stream mapping used for M&E Balance	CO2
Q 4	Justify the need of drawing the Material and Energy Balance	CO2
Q 5	Describe Pinch point and target	CO3

SECTION B

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

Q 6	Justify the use of VFD for speed control of rotary machines. How does it saves the energy?	CO1
Q 7	Explain the Affinity laws and its usefulness for energy optimization in a rotary machine	CO1
Q 8	Draw the material and energy balance diagram for a typical cooling tower plant	CO2
Q 9	Explain the benefits and application of Pinch technology.	CO3

SECTION-C

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

Q 10	Explain the techniques for enhancing the “Heat rate” of a typical thermal power plant.	CO 4
Q 11	Discuss in detail the energy optimization opportunities in a cement plant OR Discuss in detail the energy optimization opportunities in a Textile Plant	CO 5