| Name:<br>Enrolment No: | UPES |
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# UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

## Online End Semester Examination, December 2020

**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 5 marks**
2. **Instructions : Complete the statement / Select the correct answer(s)**

| | Question | CO |
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| **Q 1** | Energy Performance can be improved by (Select all the correct statements)<br>a) Reducing Energy Intensity b) Improving Efficiency<br>c) Using Greener fuel d) Reducing energy use | CO1 |
| **Q 2** | CDM project should have (Select all the correct statements)<br>a) Reduced GHG b) Reduced CO2<br>c) Additionality d) Reduced energy consumption | CO1 |
| **Q 3** | Fan should be chosen for application, when operating point is (Select all the correct statements)<br>a) Having lowest flow b) Having lowest pressure<br>c) Meeting Best performance point d) consuming least power | CO2 |
| **Q 4** | For 50% speed reduction of an Induction motor, the best option is (Select all the correct statements):<br>a) VFD b) Gear Box<br>c) Pulley size change d) Breaking clutch | CO2 |
| **Q 5** | Material & Energy Balance can be done (Select all the correct statements)<br>a) Section wise b) Equipment wise<br>c) Overall d) In Between the two batches | CO3 |

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| **Q 6** | Material & Energy Balance should be performed (Select all the correct statements)<br>a) For a defined boundary b) All the activities<br>c) all the processes d) including few energies only | CO3 |
| **SECTION B** | | |
| **1. Each question carry 10 marks**<br>**2. Instructions : Write short / brief notes** | | |
| **Q 7** | Compare the advantages and disadvantages of switching the fuel in a boiler from coal to LPG. | CO1 |
| **Q 8** | Draw the Energy and Material balance diagram for a typical Compressed air system. | CO2 |
| **Q 9** | Describe the steps for designing a Heat Exchanger Network using Pinch Technology | CO3 |
| **Q 10** | Highlight the processes affecting the SEC of a typical cotton sheet textile plant. | CO4 |
| **Q 11** | Elaborate the constraints for energy consumption reduction and optimization in a typical big hospital. | CO4 |
| **SECTION-C** | | |
| **1. Question carries 20 Marks.**<br>**2. Instruction: Write long answer.** | | |
| **Q 12** | Explain the Energy Conservation possibilities in a typical coal based Thermal Power Plant and highlight the other parameters to be optimized in various processes of a TPP.<br>**OR**<br>Explain the Energy Conservation possibilities in an Integrated Steel Plant and Why it is economical to setup with power plant? | CO5 |