


|               |  |
|---------------|--|
| Name:         |  |
| Enrolment No: |  |

## UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

**End Semester Examination, December 2019**

**Programme Name: B.Tech – Power System Engineering**

**Semester : V**

**Course Name : Steam Generator , its Aux. & BOP**

**Time : 03 hrs**

**Course Code : MEPD 3005**

**Max. Marks : 100**

**Nos. of page(s) : 02**

**Instructions : --**

### SECTION A

| S. No. | Question   | Marks | CO  |
|--------|--|-------|-----|
| Q1     | What is combustion ? What are the basic condition to be fulfilled to burn a fuel efficiently .           | 4     | CO1 |
| Q2     | Discuss the various conditions in which steam may exist . What are the advantages of superheated steam . | 4     | CO1 |
| Q3     | How are coal classified . Mention the various grades of coal based on UHV ( Useful heat value)           | 4     | CO2 |
| Q4     | Explain the important functions of a condenser in steam power plant                                      | 4     | CO3 |
| Q5     | Mention the factors on which the selection of boilers depends.   | 4     | CO4 |

### SECTION B

|    |  |     |     |
|----|--|-----|-----|
| Q6 | (a) Why is feed water treatment necessary before it is supplied to boiler ?<br>(b) What is boiler blow down ? Why it is needed . | 10  | CO2 |
| Q7 | Describe the various types of burners used to burn pulverized coal.  | 10  | CO2 |
| Q8 | Explain the boiler water circulation system . What are the various types of circulation systems ?                                | 10  | CO3 |
| Q9 | (a) How the coal is dried in mills ? (b) What is the function of classifier in pulverising system ?                              | 5+5 | CO3 |

|                  |   |   |            |
|------------------|---|---|------------|
|                  | <b>OR</b><br>What do you understand by draught ? How draughts are classified ?  | <b>10</b>                               |            |
| <b>SECTION-C</b> |   |   |            |
| Q10              | <p>Percentage composition by weight of a sample of coal was found to be as follows :</p> <p style="text-align: center;"><math>C = 62\%</math> , <math>H_2 = 5\%</math> , <math>O_2 = 8\%</math> ; Ash = 25 %</p> <p>It was also observed that the dry flue gas had the following composition by volume :</p> <p style="text-align: center;"><math>CO_2 = 10\%</math> ; <math>CO = 2\%</math> ; <math>O_2 = 13\%</math> ; <math>N_2 = 75\%</math></p> <p>Determine the following :</p> <p>(a) Minimum weight of air required for complete combustion of 1 kg of coal .</p> <p>(b) Weight of excess air required per kg of coal .</p> | <b>20</b>                               | <b>CO4</b> |
| Q11              | <p>Low air pressure is an abuse of the compressed – air system - a costly and wasteful practice which should be avoided . Mention Causes and Effects of low pressure system . What general rules to be observed in planning of Compressed – Air Distribution System</p> <p><b>OR</b></p> <p>(a) Enlist and explain the various components of Compressed air system .</p> <p>(b) Explain the terms Free air , Normal Air , Actual capacity , Isothermal compression , Adiabatic compression in connection with compressors .</p>   | <b>20</b><br><br><b>10</b><br><b>10</b> | <b>CO4</b> |

