**18EII12**

**Hall Ticket Number:**

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| **IV/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **December, 2021** | **INSTITUTIONAL EELCTIVE** | | |
| **Seventh Semester** | **POWER PLANT INSTRUMENTATION.** | | |
| **Time:** Three Hours | | **Maximum: 5**0 Marks | |
| *Answer Question No. 1 Compulsorily.* | | | (1X10 = 10 Marks) |
| *Answer* ***ANY ONE*** *question from each Unit.* | | | (4X10=40 Marks) |

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| 1. | a) | If the efficiencies of furnace, boiler, turbine are 90%, 60% and 50% respectively. Then calculate the efficiency of the plant. | **CO1** |  |
|  | b) | Write any two advantages of nuclear power compared to thermal power plant. | **CO2** |  |
|  | c) | What is the meaning of swelling of the boiler drum? | **CO2** |  |
|  | d) | What is the function of gas analyzer? | **CO3** |  |
|  | e) | How do ZrO2 is used to measure the quantity of oxygen in the flue gasses? | **CO4** |  |
|  | f) | Define liquid chromatography? | **CO4** |  |
|  | g) | What is the function ID fan? | **CO2** |  |
|  | h) | Why interlocks are important in power plant boilers? | **CO4** |  |
|  | i) | What is the function of FD fan? | **CO4** |  |
|  | j) | Classify the turbines based on process conditions? | **CO4** |  |
| **Unit – I** | | | | |
| 2. |  | Outline the importance of instrumentation and control in thermal power plant. | **CO1** | **10M** |
|  |  | **(OR)** |  |  |
| 3. |  | Illustrate the operation of thermal power plant with a neat diagram? | **CO1** | **10M** |
| **Unit – II** | | | |  |
| 4. |  | What is boiler water circulation? Explain the any two boiler water circulation techniques with neat diagrams? | **CO2** | **10M** |
|  |  | **(OR)** |  |  |
| 5. | a) | Explain and compare the single element and two element level controls with simple sketches timing diagrams? | **CO2** | **5M** |
|  | b) | List the impurities in raw water. Explain the bad effects of impurities on the boiler operation? | **CO2** | **5M** |
| **Unit – III** | | | |  |
| 6. |  | Explain the operation of fully metered air fuel ration control system with a neat diagram. | **CO3** | **10M** |
|  |  | **(OR)** |  |  |
| 7. |  | List the three basic controls expected in a turbine lubrication system? Draw and explain the control schematics for the control of a lube oil system? | **CO3** | **10M** |
| **Unit – IV** | | | |  |
| 8. |  | Explain SCADA system with a neat block diagram. | **CO4** | **10M** |
|  |  | **(OR)** |  |  |
| 9. |  | Illustrate the operation of DCS for power plant automation and also draw the schematic diagram showing different levels of DCS with different buses for power plant automation | **CO4** | **10M** |

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