**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI**
**(END SEMESTER EXAMINATION)**

**CLASS: BTECH** **SEMESTER : V**
**BRANCH: ALL** **SESSION : MO/2025**

**SUBJECT: ME393 ELEMENTS OF HYDEL AND THERMAL POWER PLANTS**

**TIME: 3 Hours** **FULL MARKS: 50**

**INSTRUCTIONS:**
**1. The question paper contains 5 questions each of 10 marks and total 50 marks.**
**2. Attempt all questions.**
**3. The missing data, if any, may be assumed suitably.**
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**

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| Q.1(a) | Explain the classification of hydropower plants based on head and capacity. Discuss the factors influencing the selection of site for a hydel power plant. | [5] | 1 | 1 |
| Q.1(b) | Describe the working principle of a Pump Storage Power Plant with a neat schematic. Highlight its advantages and limitations in modern power systems. | [5] | 1 | 2 |
| Q.2(a) | Explain with a neat sketch the principle of operation of a Pelton turbine. | [5] | 2 | 2 |
| Q.2(b) | A turbine develops 20 MW under a head of 5m at 200 rpm. What is the specific speed of the turbine? What will be its normal speed under a head of 30m? | [5] | 2 | 3 |
| Q.3(a) | Describe the general layout of a thermal power plant, explaining the role of major components. | [5] | 3 | 2 |
| Q.3(b) | Explain the function of economizer, air preheater, and superheater in a boiler system. | [5] | 3 | 2 |
| Q.4(a) | What are the various methods of coal handling in a thermal power plant? Explain advantages of using pulverized coal in a thermal power plant. | [5] | 4 | 2 |
| Q.4(b) | What are the different methods of ash disposal in a power plant? Explain the working of an electrostatic precipitator with a schematic. | [5] | 4 | 1 |
| Q.5(a) | Explain the working and classification of condensers used in thermal power plants. Discuss the effect of air leakage on condenser performance. | [5] | 5 | 2 |
| Q.5(b) | Define natural and mechanical draught. Differentiate between forced and induced draught systems. | [5] | 5 | 1 |

**::::::26/11/2025::::::M**