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17ME71

## Seventh Semester B.E. Degree Examination, Jan./Feb. 2021 Energy Engineering

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, choosing ONE full question from each module.**

### Module-1

- 1 a. Explain the principle of over feed stokes with neat diagram. (10 Marks)
- b. Explain Hydraulic ash handling process, with a neat sketch. (10 Marks)

OR

- 2 a. A chimney is 28m height and temperature of hot gases inside is 320<sup>0</sup>C. The temperature of outside air is 23<sup>0</sup>C and furnace is supplied with 15kg of air per kg of coal burnt. Calculate  
i) Draught in mm of water      ii) Draught head in meters of hot gases. (10 Marks)
- b. Explain the central or bin system of burning pulverised coal. (10 Marks)

### Module-2

- 3 a. With a neat diagram, explain the general layout of diesel power plant. (10 Marks)
- b. Explain the general layout of hydroelectric power plant, with a neat diagram. (10 Marks)

OR

- 4 a. Classify the hydroelectric power plants on the basis of head. Explain each type of plant in detail. (10 Marks)
- b. With a neat diagram, explain Pump Fuel injection system. (10 Marks)

### Module-3

- 5 a. Explain Pyranometer with neat sketch to measure beam and diffused radiations. (10 Marks)
- b. With a neat diagram, explain typical solar flat plate collector. (10 Marks)

OR

- 6 a. What are the main advantages of solar – cell? Explain the conversion of solar energy to electricity through photovoltaic cell. (10 Marks)
- b. Explain Phase change (Latent heat) heat storage concept. Explain the properties of materials used in latent heat storage. Comment on Latent heat storage materials. (10 Marks)

### Module-4

- 7 a. Derive an expression for the power of wind mill with condition. (10 Marks)
- b. With neat diagram, explain Single basin storage Tidal Power Plant and also comment on the advantages of Tidal Power Plant (Tidal). (10 Marks)

OR

- 8 a. Explain the typical horizontal axis wind mill, with a neat sketch. (10 Marks)
- b. What are the different resources that can be used as Biomass for biogas generation? (10 Marks)

### Module-5

- 9 a. Describe the photosynthesis process with relevant chemical reactions. Also explain the importance of photosynthesis in biofuel generation. (10 Marks)
- b. Explain closed Rankine cycle OTEC system with neat sketch. (10 Marks)

OR

- 10 a. Explain with a neat sketch, the water dominated Geothermal system. (10 Marks)
- b. What is the work of fuel cell? Explain typical H<sub>2</sub>O<sub>2</sub> fuel cell with a neat sketch. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.