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17ME71

**Seventh Semester B.E. Degree Examination, July/August 2022**  
**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. Draw the layout of a thermal power plant. Explain any four components of the plant. (12 Marks)  
b. What are Pulverizers? Explain ball mill pulverizers. (08 Marks)

**OR**

- 2 a. What are draughts? Explain with neat sketch forced and induced draughts. (10 Marks)  
b. Show the flow chart of coal handling system. Explain screw conveyors and bucket elevators conveying coal. (10 Marks)

**Module-2**

- 3 a. Draw a schematic diagram of diesel power plant showing all the essential components. (08 Marks)  
b. What are hydrographs and flow duration curves? (06 Marks)  
c. Differentiate between storage and pondage. List the types of hydro power plants. (06 Marks)

**OR**

- 4 a. List the merits, demerits and applications of diesel plants. (07 Marks)  
b. With neat sketches, explain air intake and exhaust systems in diesel plants. (06 Marks)  
c. Define penstocks and surge tanks. List the types of surge tanks. (07 Marks)

**Module-3**

- 5 a. What are the two components of solar radiation? Explain solar radiation measuring devices. (10 Marks)  
b. What are solar cells? Explain how do you harness solar energy in solar distillation and solar ponds. (10 Marks)

**OR**

- 6 a. Explain the working principle of flat plate solar collectors. How tubular collectors are different from them? (10 Marks)  
b. What is solar photo voltaic system? Write short notes on solar cookers. (10 Marks)

**Module-4**

- 7 a. Explain the working of horizontal and vertical axis wind turbines. How the winds are caused? (10 Marks)  
b. What are tides? Explain the components of tidal plants. List the factors influencing selection of tidal plants. (10 Marks)

OR

- 8 a. Wind at 1 std. atmospheric pressure at 15°C has velocity of 15m/sec. Calculate:
- Total power density in wind stream.
  - Maximum obtainable power density.
  - Reasonable obtainable power density.
  - Total power torque and axial thrust.

Given turbine diameter = 120m and its speed 40rpm at 35% efficiency.

(12 Marks)

- b. Differentiate single basin and double basin tidal plants.

(08 Marks)

**Module-5**

- 9 a. Show the classification of technologies in biomass conversion process. Explain them in brief. (12 Marks)
- b. What is meant by geothermal energy conversion? Explain the working of OTEC (Ocean Thermal Energy Conversion). (08 Marks)

OR

- 10 a. Write short notes on:
- Photosynthesis
  - Energy plantations
- (10 Marks)
- b. What are fuel cells? How do you classify them? Explain MHD power generation. (10 Marks)

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