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# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech III Semester End Examinations (Supplementary) - January, 2019

Regulation: IARE – R16

## POWER GENERATION SYSTEMS

Time: 3 Hours

(EEE)

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

### UNIT – I

- (a) Explain about the construction and working of modern thermal power plant and explain the working of four main components used in thermal power plant. [7M]

(b) Explain in detail about various factors to be considered in selecting the site for a thermal power plant. [7M]
- (a) Discuss the operation of super heater and economizer in thermal power plant. [7M]

(b) Draw the water flow circuit in a thermal power plant. Explain the state of water in each stage. [7M]

### UNIT – II

- (a) List out the advantages and disadvantages of Hydro power plant. [7M]

(b) Draw the schematic arrangement of various components in Hydro Electric Power Station and explain it briefly. [7M]
- (a) Draw the typical layout of hydro power plant and discuss the operation of following components  
(i) Dam (ii) Spillway (iii) Penstock (iv) Surge tank [7M]

(b) Discuss about the different types of turbines used in hydroelectric power plants in modern electrical system with diagram. [7M]

### UNIT – III

- (a) Explain the solar spectrum regions with neat sketch, which are emanating from solar system. [7M]

(b) Explain the following [7M]

  - Solar water heating system
  - Active space heating system
  - Solar photovoltaic power generation
- (a) Explain in detail about the any two measuring instruments of solar radiation with neat sketch. [7M]

(b) Explain about the Maximum power point tracking technique used in solar PV system and its association in improving the system efficiency. [7M]

#### UNIT – IV

7. (a) Explain about the operation and control of wind turbines used in wind energy systems. [7M]  
(b) Discuss about the vertical axis wind turbine system used in wind energy system. [7M]
8. (a) Describe the advantages and disadvantages of horizontal and vertical axis windmill. [7M]  
(b) What methods are used to overcome the fluctuating power generation of windmill? [7M]

#### UNIT – V

9. (a) Discuss in detail about the working and operation of Boiling Water Reactor and Fast Breeder Reactor. [7M]  
(b) Discuss the various factors to be considered while selecting site for Nuclear Power Plant. [7M]
10. (a) Discuss the sequence of actions that takes place when a neutron collides with a heavy atom. [7M]  
(b) What are the important nuclear power plants in India? What are the different merits and demerits of nuclear power plant with respect to hydro electric power plant? [7M]

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