

Total No. of Questions : 8]

SEAT No. :

**PB3611**

**[6261]-16**

[Total No. of Pages : 2

**S.E. (Electrical)**

**POWER GENERATION TECHNOLOGIES**

**(2019 Pattern) (Semester - III) (203141)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right indicate full marks.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Assume suitable additional data, if necessary.
- 5) Use of non-programmable calculator is allowed.

- Q1)** a) Explain with neat sketch the construction and working of Pelton wheel turbine used in hydro power plant. **[5]**
- b) Draw schematic arrangement of hydroelectric power station and describe energy conversion process of hydro power plant. **[5]**
- c) State the functions of the following parts of hydroelectric power station:**[8]**
- i) Reservoir
  - ii) Tailrace
  - iii) Spillway
  - iv) Surgetank
  - v) Forebay
  - vi) Turbine
  - vii) Drafttube
  - viii) Dam

OR

- Q2)** a) What are the criteria for selection of site for hydroelectric power plant.**[5]**
- b) With a neat diagram explain medium head hydro-electric power plants.**[5]**
- c) Why surge tanks are used in hydropower plant? Explain their functions.**[8]**
- Q3)** a) What are the environmental impact of wind turbine? **[5]**
- b) What are the types of wind turbine electrical generators? **[5]**
- c) Derive the relation of power in wind and explain impact of tower height on power generation in wind energy system. **[7]**

OR

**P.T.O.**

- Q4)** a) Wind turbine with 6m dia. Rotor, a coefficient of performance is 0.30 assume air density as 1.2 and wind speed is 11m/s. What is expected power in watt? [4]
- b) Explain different speed control mechanisms in wind energy system to obtain maximum power. [6]
- c) Explain how wind pattern affects power generation in wind energy systems. [7]

- Q5)** a) Explain impact of insolation and temperature on I-V curves of PV cells. [4]
- b) What is a PV system? Describe overview of recent development of PV systems. [6]
- c) What are the solar energy collectors? Write their types and compare them. [8]

OR

- Q6)** a) Explain the terms [4]
- i) Solar constant
- ii) Cloudy index
- b) Explain with neat diagram any one method to measure solar radiations. [6]
- c) With the help of diagram, describe the PV I-V curve under standard test conditions. [8]

- Q7)** a) What is a fuel cell energy storage technology? [4]
- b) Explain grid connected renewable systems and their requirements. [6]
- c) Explain how biomass energy can be converted to electricity. [7]

OR

- Q8)** a) What is a geothermal energy? [4]
- b) Explain standalone, hybrid stand alone and grid connected renewable energy sources. [6]
- c) Explain the process of municipal solid waste to energy conversion. [7]

