



17645

11819

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) All questions are **compulsory**.
 - (2) Illustrate your answers with neat sketches **wherever** necessary.
 - (3) Figures to the **right** indicate **full** marks.
 - (4) Assume suitable data, if **necessary**.
 - (5) Mobile Phone, Pager and any other Electronic Communication devices are **not permissible** in Examination Hall.

Marks

1. Attempt **any five** of the following : **20**
 - a) Electricity becomes one of the basic need in human life. Justify it.
 - b) Define the following terms
 - i) Incident angle
 - ii) Zenith angle
 - iii) Hour angle
 - iv) Solar azimuth angle.
 - c) Explain principle of heat conversion of solar heating systems.
 - d) Explain necessity of alternate energy sources.
 - e) Draw block diagram showing basic components of wind electric system and state function of each block.
 - f) State the different bio-energy sources with examples.
 - g) Explain the main factors governing the selection of site for wind energy generation.

2. Attempt **any four** of the following : **16**
 - a) Write any four advantages and four limitations of tidal power generation.
 - b) Explain construction and working of pyrliometer for measurement of beam radiation.
 - c) Explain the following :
 - i) V-I characteristic of solar cell
 - ii) Efficiency of solar PV cell.
 - d) Explain the construction and working of vertical axis wind mills.
 - e) Give two advantages and two disadvantages of geothermal energy.
 - f) Explain the working of fluidized bed gasifier with schematic diagram.

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3. Attempt **any four** of the following :

- a) Explain environmental aspects of energy and sustainable development.
- b) State eight applications of solar energy.
- c) Explain the operation of solar home lighting.
- d) Draw and explain the block diagram of constant speed constant frequency wind electric system.
- e) Explain the construction and operation of fuel cell.
- f) State the advantages and limitations of advanced solar cooker.

4. Attempt **any four** of the following :

16

- a) What is solar radiation ? Explain spectral distribution of extra terrestrial solar radiation.
- b) State the operation of box type solar cooker and write its specification.
- c) Explain salient features and characteristics of synchronous generator used in wind mills.
- d) State any two advantages and two disadvantages of drum type biomass plant.
- e) Briefly explain 'Combustion' method of obtaining energy from biomass.
- f) Explain pyranometer for measurement of global radiation.

5. Attempt **any four** of the following :

16

- a) Explain energy scenario in India.
- b) Explain various components of solar PV system.
- c) Define solar constant and write formula for it. State the meaning of each term.
- d) Explain installation and maintenance of solar heating system.
- e) State the types of wind turbines. Write any two advantages and disadvantages of vertical axis wind mill.
- f) Explain the concept of geothermal energy in brief and state the geothermal sources.

6. Attempt **any four** of the following :

16

- a) Explain the operation of solar water pumping system.
 - b) Explain schematic diagram and working of fixed bed gasifier.
 - c) State working principle of hydrogen energy and state its two advantages.
 - d) Explain the operation of solar green house.
 - e) Explain 'Fermentation' method of obtaining energy from biomass.
 - f) Explain four factors to be considered for site selection for ocean thermal electric power plant.
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