

17611

21415

3 Hours / 100 Marks

Seat No.

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- Instructions :** (1) All Questions are *compulsory*.
(2) Answer each next main Question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Assume suitable data, if necessary.
(6) Use of Non-Programmable Electronic Pocket Calculator is permissible.
(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. [A] Attempt any THREE :

3 × 4 = 12

- (a) State the advantages and limitation of renewable Energy sources.
(b) Define following terms :
(i) Solar altitude (ii) Solar Azimuth angle
(iii) Day length (iv) Local solar time
(c) List the four turbines used in small hydroelectric plant.
(d) State the uses of following instruments :
(i) Fyrite (ii) Pitot tube
(iii) Infrared thermometer (iv) Sunshine recorder

[B] Attempt any ONE :

1 × 6 = 6

- (a) Describe need of orientation in concentrating type collectors. List different methods of Sun tracking.
(b) Give classification of Solar Energy Storage System. List two applications of thermal storage.

2. Attempt any TWO :

2 × 8 = 16

- (a) Explain with neat sketch working of flat plate solar water heater. Give its two advantages.
(b) (i) List main consideration in selection of site for wind power generating station.
(ii) Draw schematic diagram showing basic components of Wind Electric System.
(c) (i) What is energy plantation ? Give its four advantages.
(ii) List the main plants proposed for energy plantation.

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- 3. Attempt any FOUR :** **4 × 4 = 16**
- (a) State the principal of photovoltaic power generation. List the main elements of SPV system.
 - (b) Draw neat sketch of solar pump system. State functions of each components.
 - (c) What is microhydel plant ? Which turbine best suited for it ?
 - (d) What is anaerobic digestion ? State factors affecting biodigestion.
 - (e) List the advantages of small scale hydroelectric plant.
 - (f) Distinguished between biomass & biogas.
- 4. [A] Attempt any THREE :** **12**
- (a) Explain lift and drag in wind mill. State its importance.
 - (b) Define – (i) Pyrolysis (ii) Fermentation
 - (c) What is Energy Audit ? State its necessity.
 - (d) Describe with neat sketch the solar distillation.
- [B] Attempt any ONE :** **6**
- (a) What is Energy Conservation ? List the methods of Energy Conservation in boiler and furnace.
 - (b) Explain the following terms :
 - (i) Solar Green house
 - (ii) Global Warming
- 5. Attempt any TWO :** **2 × 8 = 16**
- (a)
 - (i) Give classification of renewable energy sources.
 - (ii) What is non-solar renewable energy sources ? Give its examples.
 - (b)
 - (i) Compare small & mini hydroelectric plant.
 - (ii) Draw sketch of horizontal axis wind turbine. State the function of each parts.
 - (c)
 - (i) Draw flow diagram of production of ethanol from sugar cane.
 - (ii) Write down detailed energy audit methodology.
- 6. Attempt any FOUR :** **4 × 4 = 16**
- (a) List the instruments used in measurement of solar radiation. State their functions.
 - (b) Draw the sketch of solar space heating and hot water system.
 - (c) What is beam and diffuse solar radiations ?
 - (d) Explain with help of sketch working of Pyrheliometer.
 - (e) Suggest suitable instruments for measuring following :
 - (i) Detection of gas leakage
 - (ii) Wind velocity
 - (iii) Calorific value
 - (iv) Intensity of Solar radiation
 - (f) Describe the SPV solar street light.
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