

17611

21819

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.

**Marks**

1. (A) Attempt any THREE :

3 × 4 = 12

- (a) Distinguish between renewable & non-renewable energy sources.
- (b) Define the following :
  - (i) Solar Declination Angle
  - (ii) Solar Hour Angle
  - (iii) Solar Altitude Angle
  - (iv) Solar Zenith Angle
- (c) Write short note on : Algae – a new biomass
- (d) State the uses of following :
  - (i) Sunshine Recorder
  - (ii) Fyrite
  - (iii) Pyreheliometer
  - (iv) Fuel Efficiency Monitor

(B) Attempt any ONE :

1 × 6 = 6

- (a) What is a Solar Collector ? State various types of Solar Collector.
- (b) Write short note on :
  - (i) Oil Shale
  - (ii) Tar Sand

**2. Attempt any TWO :****2 × 8 = 16**

- (a) State various types of Solar Cookers. Explain with neat sketch, working of box type solar cooker. Give its advantages & disadvantages.
- (b) State the ways of improving boiler & furnace efficiency.
- (c) (i) State the classification of hydroelectric power plant.  
(ii) State advantages & disadvantages of wind energy conversion system.

**3. Attempt any FOUR :****4 × 4 = 16**

- (a) Differentiate between conventional fuel & biomass.
- (b) Explain Solar Distillation process.
- (c) Explain importance of energy conservation.
- (d) What is the need to switch over renewable energy sources ?
- (e) Which are the factors considered for site selection of hydroelectric power plant ?

**4. (A) Attempt any THREE :****4 × 3 = 12**

- (a) Explain Solar space cooling with neat sketch.
- (b) Explain with neat sketch working of horizontal axis wind turbine.
- (c) Explain process of anaerobic digestion.
- (d) Explain working of Pyranometer.

**(B) Attempt any ONE :****1 × 6 = 6**

- (a) What do you understand by energy audit ? Explain detailed audit methodology.
- (b) Explain thermal energy storage.

**5. Attempt any TWO :****2 × 8 = 16**

- (a) Explain construction & working of photovoltaic energy conversion. State its advantages & applications of Solar photovoltaic system.
- (b) (i) With neat sketch explain, construction & working of Francis turbine.  
(ii) Write a short note on lift & drag.
- (c) List the methods of obtaining energy from biomass. Explain any one with neat sketch.

**6. Attempt any FOUR :****4 × 4 = 16**

- (a) What is thermal insulation ? Explain critical thickness of insulation.
  - (b) State advantages & disadvantages of nuclear.
  - (c) Write a short note on Energy Plantation.
  - (d) What is microhydel Plant ? Which turbine is best suited for it ?
  - (e) Explain Solar constant.
  - (f) Explain with neat sketch Solar Flat Plate Collector.
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