17611

11920

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Answer each Section on same / separate answer sheet.

(3) Answer each next main Question on a new page.

(4) Illustrate your answers with neat sketches wherever necessary.

(5) Figures to the right indicate full marks.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. (a) Attempt any THREE of the following : **12**

(i) Explain different types of renewable energy sources and its utilization.

(ii) Draw neat sketch of solar refrigeration system.

(iii) With the help of sketch explain solar concentrating collector.

(iv) List out four parameters considered during site selection.

(b) Attempt any ONE of the following : **6**

(i) State the uses of following instruments :

(a) Lux meter

(b) Pyranometer

(c) Pitot tube

(d) Fyrite

(e) Infrared thermometer

(f) Fuel efficiency monitor

(ii) Describe need of orientation of concentrating type collectors. List different methods of sun tracking.

2. Attempt any TWO of the following : **16**

(a) Define following terms related to the geometry.

(1) Altitude angle

(2) Zenith angle

(3) Day length

(4) Solar azimuth angle

(5) Local solar time

(6) Surface azimuth angle

(7) Slope

(8) Declination

(b) (i) Explain Energy plantation. Give its four advantages.

(ii) Compare wet fermentation and dry fermentation.

(c) (i) Explain Energy conservation. Explain the means to improve boiler efficiency (atleast four).

(ii) Define Energy audit. Explain in short energy audit of boiler.

3. Attempt any FOUR of the following : **16**

(a) Explain the phenomena of global warming.

(b) Distinguish between biomass & biogas.

(c) Explain with neat sketch working of Francis turbine.

(d) Explain the process of photosynthesis.

(e) Distinguish between concentrating and non-concentrating solar collector.

(f) Write down detailed energy audit methodology.

4. (a) Attempt any THREE of the following : **12**

(i) Define : (1) Pyrolysis (2) Fermentation

(ii) State the principle of photovoltaic power generation. List the main elements of SPV system.

(iii) List advantages of renewable energy sources.

(iv) Draw schematic diagram showing basic components of wind power generation.

(b) Attempt any ONE of the following : **6**

(i) Explain in detail waste heat recovery system.

(ii) Explain construction and working of hydro-electric power plant.

5. Attempt any FOUR of the following : **16**

(a) Classify wind turbine. Draw neat sketch of horizontal axis wind turbine.

(b) Draw neat sketch :

(1) Solar space heating

(2) Solar food dryer

(c) Explain the concept of solar distillation with neat sketch.

(d) Explain with neat sketch passive solar heating system.

(e) Explain with neat sketch working of wind energy system with main components.

(f) Explain with neat sketch fuel cell system.

P.T.O.

6. Attempt any FOUR of the following : **16**

(a) Explain how "Green house gases" and "Global warming" is affecting the climate design.

(b) State any eight application of solar energy.

(c) Explain in brief anaerobic digestion. What are the factors which affect bio-digestion ?

(d) Classify hydro-electric power plant.

(e) State the principle of Angstrom type pyrheliometer along with a schematic diagram.

(f) (i) Give list of materials use for biogas generations.

(ii) State the main application of biogas.
