17645

16172

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

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** : **12**

a) State the need of alternative energy sources in present energy scenario.

b) Define renewable energy sources and give four examples.

c) Define 'Solar Constant' and state its formula.

d) With reference to radiation geometry define :
Solar azimuth angle, Zenith angle, Incident angle and declination.

B) Attempt **any one** : **6**

a) Listout the different types of solar collectors and explain the working of any one.

b) State components, specifications and operation of Dish type Solar cooker.

2. Attempt **any four** : **16**

a) Discuss the environmental aspects associated with the energy utilization.

b) List the equipments used for solar radiation measurement and explain any one in brief.

c) Explain construction and operation of Advanced Solar Cooker.

d) State the working principle and applications of Solar Pond.

e) State the meaning of following terms :
Power in the wind, Max. power, Power coefficient, Wind-energy conversion.

f) State the criteria to be considered in selecting the site for wind mills.

3. Attempt **any four** : **16**

a) With the help of pie-chart explain the potential of renewable energy sources uptill now.

b) Define tilt factor for beam radiation and state factors on which it depends.

P.T.O.

Marks

c) State and explain the following methods to obtain energy from biomass :
Anaerobic digestion
Gasification.

d) Draw neat labelled schematic diagram of fluidized bed biomass gasifier.

e) Give the advantages and disadvantages of geothermal energy.

f) State the thermal classification of biomass.

4. A) Attempt **any three** : **12**

a) State construction and operation of solar dryer.

b) With the help of neat labelled diagram explain the construction of solar PV Module.

c) Draw neat block diagram of variable speed constant frequency, wind-electric generation system.

d) State the difference between closed cycle and open cycle ocean thermal electric power generation.

B) Attempt **any one** : **6**

a) Draw neat diagram of dome and drum type biomass plant.

b) State the components of tidal power plant and state their functions.

5. Attempt **any four** : **16**

a) Draw neat schematic representation of distribution of solar energy.

b) State the limitations of pyrheliometer for measurement of beam radiation.

c) State the difference between horizontal axis and vertical axis wind turbines.

d) State any two advantages and two limitations of hydrogen energy.

e) State the difference between Dome type and Drum type biomass plants. (any 4).

f) Give the classification of bio-energy sources and explain each with example.

6. Attempt **any two** : **16**

a) With the help of block diagram explain operation of solar home lighting system and state its applications.

b) State the salient features and characteristics of induction generator used in wind mills.

c) With reference to fuel cell, explain its principle, construction, operation and applications.