17676

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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.

(5) Assume suitable data, if necessary.

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

Marks

1. Attempt any TEN of the following: **20**

a) State the importance of non conventional energy sources in context of global warming.

b) Explain the phenomenon of continuous energy production in the sun.

c) List down the advantages of a flat plate solar collector.

d) Draw a neat labelled sketch of solar space heating system.

e) Draw a schematic layout of floating drum type biogas plant.

f) Describe anaerobic digestion.

g) List down the advantages and disadvantages of biomass energy.

h) State the different methods to obtain biomass.

i) Define biomass and biomass energy.

j) State the various organic sources by which the biogas can be produced by anaerobic decomposition.

k) State the basic principle of wind energy conversion.

Marks

l) State any two advantages and limitations of wind energy conversion system.

m) Describe the basic difference between fuel cell and a battery.

n) Enlist the different methods for hydrogen production, for use as energy carrier.

o) Cite the classification of hydel plants.

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

a) Explain the principle of conversion of solar energy into heat with suitable sketch.

b) Explain the process of gasification of solid bio fuels.

c) Explain with a neat sketch, the concept of a community biogas plant.

d) Classify 'Wind energy conversion system'. Explain any one system in brief.

e) Define and classify the geothermal sources.

f) Explain the layout of typical micro hydel plant with a suitable sketch.

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

a) Distinguish between renewable and non renewable energy sources with different parameters.

b) Define the following terms:

(i) Hour angle

(ii) Declination angle

(iii) Angle of incidence

(iv) Zenith angle

c) Compare floating drum type and fixed dome type biogas plant.

d) Describe the basic considerations in selecting a site for wind generators.

e) State the advantages and disadvantages of Geothermal energy.

f) Define and explain the terms mini and micro hydel power plants.

Marks

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

a) State the need of alternate energy sources in Indian context.

b) Explain with a neat sketch working of parabolic dish collector.

c) Differentiate between biomass and conventional fuel.

d) Draw basic structure of wind mill and explain its various components.

e) Comment on the current status of geothermal energy in India.

f) Define 'fuel cell'. State its merits and potential applications.

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

a) Explain the concept of primary and secondary energy sources in brief.

b) State the features of solar energy which makes it attractive for use in irrigation pumps.

c) Differentiate between Aerobic and Anaerobic bio-chemical conversion processes.

d) Sketch the diagram of a VAWT and explain the function of major components.

e) Explain the concept of power generation by using geothermal heat.

f) Explain the method of thermal de-composition of water for production of Hydrogen.

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

a) Discuss the energy scenario with context to Indian Economy.

b) Explain solar distillation with suitable sketch.

c) Explain the concept of solar furnace with the help of suitable sketch.

d) (i) Give the classification of gasifiers.

(ii) State the potential applications of gasifier.

e) Explain the application of wind energy for pumping with sketch.

f) Comment on safety issues related to Nuclear Waste Disposal.