

D 30567

(Pages 3)

Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, OCTOBER 2012

(CCSS)

PH 5D 01 (1)—NON-CONVENTIONAL ENERGY SOURCES

(Open Course)

Time : Three Hours

Maximum : 30 Weightage

I. Objective Type Questions. Answer *all* twelve questions :

- 1 The amount of energy received in unit time on a unit area held perpendicular to the sun's direction at the mean distance of the earth from the sun is called :
  - (a) Zenith.
  - (b) Solar mass.
  - (c) Air mass.
  - (d) Solar constant.
- 2 Which among the following is the main advantage of solar energy with regard to its applications ?
  - (a) Intermittent nature.
  - (b) Large area requirement.
  - (c) Non-polluting.
  - (d) High cost fuel.
- 3 The purpose of a solar cell is to convert solar energy to :
  - (a) Electrical energy.
  - (b) Heat energy.
  - (c) Chemical energy.
  - (d) Magnetic energy.
- 4 In a solar pond, the stored heat energy is lost, in course of time, mainly because of :
  - (a) Radiation.
  - (b) Conduction.
  - (c) Convection.
  - (d) Reflection.
- 5 Wind energy option is :
  - (a) Renewable.
  - (b) Non-renewable.
  - (c) Highly polluting.
  - (d) Maintenance free.
- 6 Wind turbines are connected to \_\_\_\_\_ for converting wind energy to electrical energy.
- 7 In biomass, solar energy is stored in the form of chemical energy by the process of \_\_\_\_\_.
- 8 Which among the following energy source do not suffer from intermittency ?
  - (a) Solar energy.
  - (b) Geothermal energy.
  - (c) Wind energy.
  - (d) Tidal energy.

Turn over

- 9 The power of a battery is measured in which units ?  
(a) Volts. (b) Watts.  
(c) Amperes. (d) Joules.
- 10 Among the following, which is not a non-conventional source of energy ?  
(a) Solar energy. (b) Hydro energy.  
(c) Hydrogen energy. (d) Tidal energy.
- 11 Tide is a periodic rise and fall of the water level of the sea which are carried by the action of the ——— and the moon on the water of the earth.
- 12 What is the common waste product of a fuel cell ?

(12 × ¼ = 3 weightage)

II. Short Answer type questions. Answer *all* nine questions :

- 13 Distinguish between direct and diffuse components of solar radiation.
- 14 Draw the schematic of a solar distillation system indicating the major parts.
- 15 List four merits of a solar cooker.
- 16 What are the causes for local winds ?
- 17 What do you mean by biomass ?
- 18 What are the four sources of energy available from ocean ?
- 19 List four advantages of tidal power.
- 20 Write four applications of a fuel cell.
- 21 Write down the problems associated with storage of hydrogen fuel in motor vehicles.

(9 × 1 = 9 weightage)

III. Short essay type questions. Answer *any five* questions from seven :

- 22 Discuss the working principle of a solar furnace.
- 23 What do you mean by photovoltaic effect ? List three advantages and disadvantages of a photovoltaic power conversion system.
- 24 Discuss the applications of wind energy.
- 25 Explain the term biomass conversion ? Discuss the different biomass conversion technologies.
- 26 What is meant by a hydrothermal source ? Discuss the different hydrothermal resources.
- 27 What is the origin for the source of energy in waves ? Discuss a method for converting wave energy to mechanical energy ?
- 28 What is meant by a battery ? Give examples. Discuss the working principle of a battery.

(5 × 2 = 10 weightage)

IV. Essay questions. Answer any *two* questions from three :

- 29 Discuss the working principle of a solar water heater with the help of a schematic. Distinguish between natural circulation and forced circulation solar water heater. What are the merits of a solar water heater over a conventional water heater ?
- 30 What is the principle of wind energy conversion ? With the help of a block diagram, discuss the basic components of a wind energy conversion system. List few advantages and disadvantages of wind energy conversion system.
- 31 What is the source of geothermal energy ? What are the advantages and disadvantages of geothermal energy over other forms of energy ? Discuss the applications of geothermal energy.  
(2 × 4 = 8 weightage)