

D 50733

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Name.....

Reg. No.....

**FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2013**

(UG-CCSS)

Physics—Open Course

PH5D 01(1)/AP5D 01(1)—NON-CONVENTIONAL ENERGY SOURCES

Time : Three Hours

Maximum : 30 Weightage

**Part I**

*Answer all questions from this part.*

*Each question carries a weightage of 1/4.*

**I. Objective type questions. Answer all questions :**

- 1 Which of the following is an example of primary energy source :
  - (a) Solar cell.
  - (b) Coal.
  - (c) Bio gas.
  - (d) Wood.
- 2 The intensity of solar radiation reaching at the outer limit of atmosphere is maximum for a wavelength :
  - (a) 0.28  $\mu\text{m}$ .
  - (b) 0.48  $\mu\text{m}$ .
  - (c) 1.8  $\mu\text{m}$ .
  - (d) 2.5  $\mu\text{m}$ .
- 3 An example of material for phase change energy storage is :
  - (a) Hydrogen.
  - (b) Water.
  - (c) Carbon.
  - (d) Oil.
- 4 An example of indirect solar electrical technology is :
  - (a) Wind power plant.
  - (b) Nuclear power.
  - (c) Hydroelectric power.
  - (d) Solar water heater.
- 5 The contours of constant wind power is called :
  - (a) Isocotes.
  - (b) Isovents.
  - (c) Isodynes.
  - (d) Isobars.
- 6 Which one of the following is a renewable energy source ?
  - (a) Coal.
  - (b) Natural gas.
  - (c) Biomass.
  - (d) None of the above.

**Turn over**

- 7 Ozone absorbs mainly the \_\_\_\_\_ band of sunlight.
- 8 Solar cells use \_\_\_\_\_ effect to convert solar energy directly to electrical energy.
- 9 In a wind turbine for power generation, \_\_\_\_\_ energy is converted to electrical energy.
- 10 Geothermal steam originating from the magma of the earth is called \_\_\_\_\_.
- 11 Periodic rise and fall of the water level of sea under the influence of sun and moon is called \_\_\_\_\_.
- 12 \_\_\_\_\_ is an example of alkali-metal high temperature batteries.

(12 × ¼ = 3 weightage)

### Part II (Short Answer Type Questions)

*Answer all nine questions.  
Each question carries 1 weightage.*

- 13 Define Solar constant.
- 14 What do you mean by the declination of the solar rays ?
- 15 Name the different types of solar collectors.
- 16 What are the two primary mechanisms for producing forces from wind on a wind turbine ?
- 17 What do you mean by biomass energy sources ? Give examples.
- 18 What do you mean by the magma of earth ?
- 19 What is meant by a geothermal reservoir ?
- 20 Define tidal range.
- 21 What is meant by a fuel cell ? How is it different from a battery ?

(9 × 1 = 9 weightage)

### Part III (Short Essay Type Questions)

*Answer any five questions.  
Each question carries 2 weightage.*

- 22 Describe the different methods used for storing solar energy.
- 23 Explain the technology and applications of a solar pond.
- 24 With the help of a diagram, explain the principle of solar furnace. Explain any one application of solar furnace.
- 25 With the help of diagram, explain the parts of a horizontal axis type wind power generator.
- 26 Explain the construction and working of a biogas plant.
- 27 What are the advantages and disadvantages of geothermal energy form.
- 28 With the help of a diagram, explain the operation of a wave-energy converter using floats.

(5 × 2 = 10 weightage)



**Part IV (Essay Questions)**

*Answer any two questions.  
Each question carries 4 weightage.*

- 29 Explain the action of different types of flat-plate solar collectors. What are the advantages of flat-plate collectors ?
- 30 (a) What are the geothermal sources ?  
(b) Describe any one technique for generating power from geothermal sources.
- 31 Write short notes on :  
(a) Hydrogen fuel cells.  
(b) Lead acid battery.

(2 × 4 = 8 weightage)