No. of Printed Pages : 4

BIEE-029

DIPLOMA IN ELECTRICAL ENGINEERING (DELVI) / ADVANCED LEVEL CERTIFICATE COURSE IN ELECTRICAL ENGINEERING (ACELVI)

00832

Term-End Examination

December, 2017

BIEE-029 : POWER GENERATION SYSTEMS

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt any* ***five*** *questions. All questions carry equal marks. Use of scientific calculator is permitted.*

1. Select the suitable objective answer for the following : *7×2=14*

(a) Which is the cheapest plant in operation and maintenance ?

(i) Diesel power plant

(ii) Hydroelectric plant

(iii) Thermal power plant

(iv) Nuclear power plant

(b) Economisers are used to heat

(i) Air

(ii) Feedwater

(iii) Steam

(iv) Hydrogen

(c) The cost of fuel transportation is minimum in

(i) Thermal power plant

(ii) Hydroelectric plant

(iii) Nuclear power plant

(iv) Both (i) and (iii)

(d) Which type of turbines are used for high head hydroelectric plants ?

(i) Pelton wheel

(ii) Francis

(iii) Kaplan

(iv) None of the above

(e) The process that converts solid coal into liquid hydrocarbon fuel is called

(i) Liquefaction

(ii) Carbonation

(iii) Catalytic Conversion

(iv) Gasification

(f) Fuel cells are

(i) Carbon cells

(ii) Hydrogen battery

(iii) Chromium cells

(iv) Lithium cells

(g) Photovoltaic cell is made of

(i) Ge

(ii) Si

(iii) Li

(iv) Mg

2. (a) What is the function of a photovoltaic solar cell ? Write its advantages and limitations. 7

(b) A solar cell is having an area of 25×10^{-4} m^2 and produces a power of 0·2 W. If the intensity of solar radiation is 700 W/m^2, find the efficiency of the solar cell. 7

3. (a) Draw a schematic diagram of a MHD power generating station having heat recovery steam generator. Explain in detail. 7

(b) What is a fuel cell ? Explain the operating principle of a fuel cell with a neat schematic diagram. 7

4. (a) Explain the working of the wind power generation system. Give the classification of rotor used for wind generation. 7

(b) What is biomass ? How is it highly useful for rural applications ? 7

5. (a) Explain the construction and working of solar stills. What are the various types of vertical and horizontal axis machines ? Describe the construction of a three-blade horizontal shaft wind turbine generator unit. *7*

(b) Explain the principle of open cycle Ocean Thermal Energy Conversion (OTEC) system with a suitable diagram. *7*

6. (a) Explain the various methods of Tidal power generation. What are its limitations ? *7*

(b) Explain the functions of spillways and penstocks in hydroelectric power stations. *7*

7. Write short notes on any ***two*** of the following : *2×7=14*

(a) Thermoelectric Materials and their Applications

(b) Solar Water Heaters

(c) Present Scenario of Non-conventional Energy Sources in India