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

00206

Term-End Examination

June, 2015

BIEE-029 : POWER GENERATION SYSTEM

Time : 2 hours *Maximum Marks : 70*

Note : *Question no. 1 is* ***compulsory****. Attempt any* ***four*** *from questions no. 2 to 8. All the questions carry equal marks.*

1. (a) In which part of the steam power plant is the pressure of steam less than the atmospheric pressure ?

(b) The output of a single solar cell is of the order of

(i) 0·1 W

(ii) 0·5 W

(iii) 1 W

(iv) 5 W

(c) MHD power plants use steam of very low pressures for power generation in steam turbines. (True/False)

(d) In a system, if the base load is the same as the maximum demand, the load factor will be _____ .

(e) In a hydroelectric plant a conduit system for taking water from the intake works to the turbine is known as

(i) Dam

(ii) Reservoir

(iii) Penstock

(iv) Surge tank

(f) Tidal energy mainly makes use of

(i) kinetic energy of water

(ii) potential energy of water

(iii) both kinetic and potential energy of water

(iv) None of the above

(g) A steam power station will run with maximum efficiency when it runs

(i) at low steam pressure

(ii) on pulverized coal

(iii) at higher speed

(iv) near full load *7×2=14*

2. (a) Define maximum demand, average demand, plant capacity factor and plant use factor. 7

(b) Show the schematic arrangement of diesel power station layout and give its principle of operation. 7

3. (a) State the functions of the following parts of hydroelectric power station : 7

(i) Tail race

(ii) Turbine

(iii) Penstock

(iv) Reservoir

(v) Surge tank

(b) A hydroelectric power station has a dam constructed at 250 m above ground level and the available water head is 200 m. Which type of turbine is to be selected for the same ? Draw a labelled sketch of that water turbine. 7

4. (a) State the combined operation of hydroelectric power plant and steam power plant. 7

(b) List and state any four limitations of interconnected power system. 7

5. (a) State the working principle of generating electrical energy from the ocean tides. 7

(b) Define the term fuel cell. Explain the working principle of fuel cell with a neat diagram. 7

6. (a) Describe the fermentation method of conversion of biomass into biogas in detail. 7

(b) With a neat block diagram, state the process of converting solar energy into electrical energy. Give a diagram showing the elements of such a plant. 7

7. (a) Draw a labelled sketch of a geothermal power plant and write its working. 7

(b) Explain the open and closed cycles of Ocean Thermal Electric Conversion (OTEC). 7

8. (a) Define the terms nuclear fission and chain reaction as referred to nuclear power station. 7

(b) Describe the working principle of wind turbine. What is the importance of Variable Frequency Drive (VFD) in wind energy to electrical energy conversion ? 7