| BIEE-037 |

DIPLOMA IN ELECTRICAL ENGINEERING (DELVI)
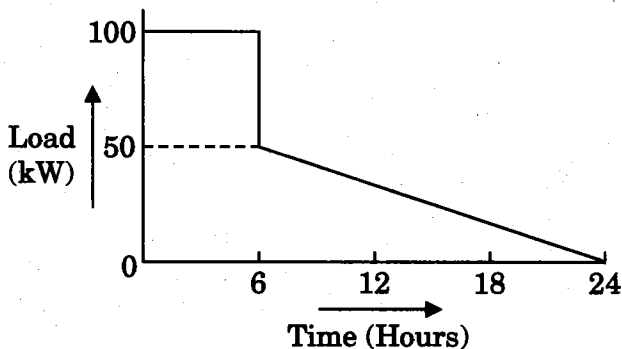
Term-End Examination

00386　　　　　**June, 2015**

BIEE-037 : POWER PLANT ECONOMICS AND CONTROL

Time : 2 hours　　　　　　　*Maximum Marks : 70*

Note : *Attempt* **five** *questions in all. Question no.* **1** *is* **compulsory.** *Use of scientific calculator is permitted.*

1. Choose the correct answer from the given alternatives :　　　　　　　*7×2=14*

    (a) The load of a system is shown in the following figure :

The load factor of the system is

    (i)   0·778

    (ii) 0·667

    (iii) 0·438

    (iv) 0·331

(b) Which of the following plants can never have 100% load factor ?

(i) Nuclear power plant

(ii) Hydroelectric plant

(iii) Peak load plant

(iv) Base load plant

(c) A consumer finds that after running 10 kVA equipment on full load for six hours, the energy consumption is 8 kW. It can be concluded that

(i) the load factor of the consumer for the day is unity

(ii) the maximum demand of the consumer is 10 kW

(iii) the equipment draws reactive power only

(iv) power factor of the equipment is 0·8

(d) In a 440 V system, in order to obtain the minimum cost and maximum benefits, the capacitor should be installed

(i) at the load

(ii) near the transformer

(iii) anywhere in the circuit

(iv) near the earthing point

(e) Identify the incorrect relation.

    (i) Power factor = kW/kVA

    (ii) kW = kVA × power factor

    (iii) kVA × kW = power factor

    (iv) kVA = kW/power factor

(f) For a thermal power plant, which is *not* a fixed cost ?

    (i) Interest on capital

    (ii) Depreciation

    (iii) Insurance charges

    (iv) Cost of fuel

(g) The maximum demand of a consumer is 2 kW and the daily energy consumption is 20 units. The load factor is

    (i) 10·15%

    (ii) 41·67%

    (iii) 50%

    (iv) 60%

2. Explain the different tariffs in use and mention the type of consumers for which each is applicable. *14*

3. Explain the combined operation of hydroelectric station and thermal station. Enlist the advantages of the combined operation.   *14*

4. Explain Active and Reactive power optimization with regard to economic dispatch of power flow.   *14*

5. What do you understand by fixed cost and operational cost of power plants ? How do these factors vary for different types of power stations ?   *14*

6. (a) A generating station has a connected load of 43 MW and a maximum demand of 20 MW; the units generated being 61.5×10^6 per annum. Calculate the

      (i) demand factor and

      (ii) load factor.   *7*

    (b) Explain steam pressure control technique used in a Boiler.   *7*

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

    (a) Coal Analysis

    (b) Supervisory Control and Monitoring System

    (c) Spinning Reserve

———