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BIEE-037

DIPLOMA IN ELECTRICAL ENGINEERING (DELVI)

Term-End Examination

December, 2015

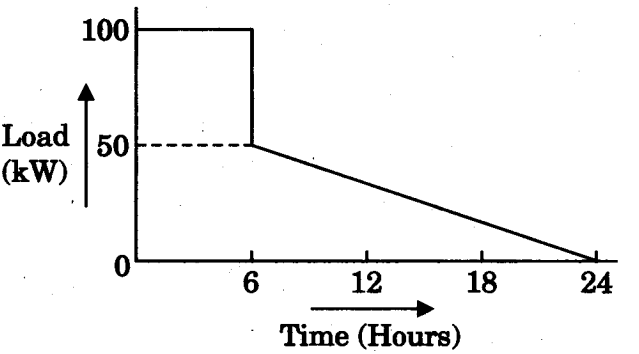
BIEE-037 : POWER PLANT ECONOMICS AND CONTROL

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 :



Load factor for the period 6 – 24 hours period is

(i) 0·438

(ii) 0·50

(iii) 0·876

(iv) 1·00

(b) Which meter is installed at the premises of a consumer for recovery of charges of electrical energy ?

(i) Voltmeter

(ii) Ammeter

(iii) kVA meter

(iv) kWh meter

(c) Which equipment provides fluctuating load ?

(i) Lathe machine

(ii) Exhaust fan

(iii) Welding transformer

(iv) All of the above

(d) The capital cost per MWh is highest in case of

(i) steam power plants

(ii) diesel engine power plants

(iii) nuclear power plants

(iv) hydroelectric power plants

(e) A steam power station will run with maximum efficiency when it is run

(i) at low steam pressure

(ii) on pulverized coal

(iii) at higher speeds

(iv) near full load

(f) In case of medium sized induction motor, the power factor will be maximum at

(i) No load

(ii) 50% load

(iii) Full load

(iv) Power factor remains constant at all loads

(g) The power factor of a system on a 460 V, 3-phase, 60 Hz, in which the ammeter indicates 100 amp and the wattmeter reads 62 kW will be

(i) 0·95

(ii) 0·74

(iii) 0·65

(iv) 0·55

2. Explain the two-part and three-part tariffs and give the economic basis for adopting the above tariffs. *14*

3. Discuss the factors affecting the economics of generation of power and how one can reduce the cost of power generation. *14*

4. (a) Discuss the economic loading of combined steam and hydro plants. *7*

(b) What is the importance of diversity factor and load factor and how do they influence the cost of generation ? *7*

5. Explain the paramagnetic and zirconium sensor in respect of gas analysis. *14*

6. Determine the thermal efficiency of a power station and its coal bill per annum from the following data : *14*

Maximum demand :	20 MW
Coal consumption :	0·54 kg/kWh
Load factor :	50%
Calorific value of coal :	6400 kcal/kg
Price of coal :	₹ 500 per tonne

7. Discuss the methods used for coordination of incremental fuel cost and incremental transmission loss in the economic loading studies of power plant. *14*

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

   (a) Furnace Draft Control Method

   (b) Unit Commitment

   (c) Subsidization and Cross Subsidization