BHARATI VIDYAPEETH INSTITUTE OF TECHNOLOGY
Question Bank (I-Scheme)

Name of subject: Utilization of Electrical Energy

Unit Test: II

Subject code: 22626

Course: EE6I

Semester: VI

UNIT-III

Electric Drives and Elevators
(CO3)

(2 Marks)

1. Write any two conditions for regenerative braking.
2. Enlist the various types of electric drives used in Industry.
3. Give one application each of any two types of bearings.

(4 Marks)

1. Draw the curve and estimate suitable H.P. of motor having following duty cycle :
1) Rising load from 200 to 400 H. P. - 4 minute
2) Uniform load of 300 H.P. - 2 minute
3) Regenerative braking from 50 to zero H.P. - 1 minute
4) Idle for - 1 minute

2. State any three safety and protective devices and their functions used in elevator.

3. State the types of elevator based on: i) Speed and ii) Capacity. State any two functions of elevator.

4. An electric motor has load as given below:
    i) Torque 150 Nm for 20 minutes   ii) Torque 50 Nm for 10 minutes
    iii) Torque 220 Nm for 10 minutes iv) Torque 120 Nm for 20 minutes
If speed of motor is 750 r.p.m. Find the power rating of motor if efficiency is 85%

   i)   State the factors on which size of motor selection depends. Define standard rating of motor as per IS. Draw load cycles for any two types of loading.

ii)   For an elevator, state – i) Function ii) any two types iii) any two motors used iv) any two applications.

iii)   Select the type of enclosures for the electric drives used in following places with justification.
   (i) Drives used in petroleum station / chemical plants.
   (ii) Electric drives used in damp situation
   (iii) Electric drives used in coal handling plants.

iv)   Explain with necessary circuit diagram, plugging applied to D.C. series motor.
v)   Draw and explain the load cycle for the following type of load:
   i) Intermittent loading
   ii) Continuous operation with short time loading.
vi)   Define mechanical power transmission system of electric drive. List out its types.

UNIT-IV

Electric Traction (CO4)

(2 Marks)

1 List any four requirements of an ideal traction system.

2. State any two special features of Metro Railway

3. Compare urban, suburban and mainline services on the following points:
i) Distance between substation ii) Value of acceleration.

4. State various types of track electrification system.

5. Draw speed time curve for main line service and mark all parameters in it.

(4 Marks)

1.   Describe any four advantages of 25 kV A.C. traction system. t.

2.   Define i) Average speed and ii) Schedule speed in traction system.
Write any two factors affecting the schedule speed.

3.   Compare electric locomotive over diesel locomotive on the basis of:

(i) Centre of gravity,

(ii) Running / maintenance cost,

(iii) Starting time and

(iv) Regenerative braking.

4.   A trapezoidal time curve of train consists of :

i) Uniform acceleration of 6 kmphps for 25 seconds

ii) Free running for 10 minutes

iii) Uniform deceleration of 6 kmphps to stop the train

iv) A stop time of 5 minutes.

Find the distance between the stations, average and scheduled speed.

5. "DC series motor is used for traction purpose". Justify.

6. A train has schedule speed of 60 kmph between stops which are 6 km apart. Determine the crest speed over the run assuming:

i) Duration of stops as 60 sec

ii) Acceleration as 2 kmphps

iii) Retardation as 3 kmphps

The speed time curve is trapezoidal.

7. Describe the working of Faiveley type pantograph with a neat sketch.

8. Draw a neat labeled block diagram of A.C electric locomotive.Explain the function of different parts.

UNIT - V
Tariff and Power Factor Improvement (CO5)

(2 Marks)

1. Explain any four desirable characteristics of tariff .

2. State any two disadvantages of low power factor.

3. List any four causes of low power factor

4. What is KVA maximum demand tariff?

(4 Marks)

1. Describe a tariff mainly used to prepare bill for i) L.T. Residential consumer ii) H.T. Industrial consumer.

2. State any six advantages of power factor improvement.

3. A factory has a maximum demand of 300 kVA with a load factor of 0.6.The following tariffs are offered:
 a) Two part tariff - Rs 125/kVA of M.D./year + Rs 5.50 per kWh.
 b) A flat rate of Rs 6.90 /kWh.
Calculate tariff in both cases and recommend one of them with justification.

4. Explain synchronous motor can be used for power factor improvement.

5.Explain the following types of tariffs
   i) Uniform rate simple tariff   ii) Step rate tariff
   iii) Two part tariff   iv) Block rate tariff