22626

23242

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **10**

a) Define :

i) Depreciation factor

ii) Glare

b) State any four types of electric heating.

c) Suggest suitable electric drive for following application

i) Electric traction

ii) Paper mills

d) State different types of traction motors.

e) State any two types of bearing and its application.

f) List any four desirable characteristics of tariff.

g) Write the classification of resistance welding.

P.T.O.

Marks

2. Attempt any THREE of the following: **12**

a) State laws of illumination

i) Inverse square law

ii) Lamberts cosine law

b) Draw and explain the principle of dielectric heating.

c) State the salient features of Bombay Lift Act - 1939.

d) Describe conductor rail (third rail) current collection system.

3. Attempt any THREE of the following: **12**

a) Explain with neat diagram metal halide lamp.

b) Explain with neat sketch working of Ajax Wyatt vertical core furnace.

c) Explain with necessary circuit diagram plugging braking applied to D. C. series motor.

d) Describe the static capacitor method of power factor improvement.

4. Attempt any THREE of the following: **12**

a) List different types of welding. Explain any one.

b) Draw simplified speed time curve. Show and list various time periods associated with it.

c) Compare between urban line, sub-urban line and main line services on following points -

i) Distance between two railway station

ii) Acceleration

iii) Retardation

iv) Maximum speed

v) Specific energy consumption

vi) Free running period absent or present

vii) Coasting period absent or present

viii) Shape of speed time curve

Marks

d) Draw the curve and estimate suitable H.P. of motor having following duty cycle.

i) Rising load from 200 to 400 HP - 5 minutes

ii) Uniform load of 400 HP - 2 minutes

iii) Regenerative braking from 50 to zero HP - 1 minute

iv) Idle for - 1 minute

e) A 3-phase, 440 V, 50 Hz, 40 kW load has a p.f 0.85 lagging. Calculate kVAR rating of capacitor required to improve p.f. to 0.95 lagging. What will be the value of capacitor per phase, if capacitor is connected in star?

5. Attempt any TWO of the following: **12**

a) State the factors to be considered for selection of shape and size of elevators.

b) A train runs between two station is 2 km apart at average speed of 40 kmphr. Train accelerates at 2 kmphrpsec and retards at 3 kmphrpsec. Assume trapezoidal speed time curve.

Calculate

i) Draw speed time curve and markall

ii) Maximum speed

iii) Distance travelled by train before the brakes are applied.

c) A factory has a maximum demand of 300 kW with a load factor of 0.7. The following tariffs are offered.

i) Two part tariff 80/kw of M.D/year + 6 paise/kWh.

ii) A flat rate of 15 paise/kWh.

Which tariff is economical?

Marks

6. Attempt any TWO of the following: **12**

a) Explain with neat sketch

i) Spot welding

ii) Seam welding and state two application of each

b) State the need of load equalization in drive. Describe the common method to achieve load equalization in industry.

c) Draw a neat labelled block diagram of AC electric locomotive. State the function of each part.