

22626

12526

3 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Answer each next main Question on a new page.
- (3) Illustrate your answer 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) State the causes of low power factor.
- b) Define :-
- i) Lamp efficiency
- ii) Lux
- c) State any two application of Induction Heating.
- d) Suggest suitable electric drive for following application :-
- i) Electric crane
- ii) Textile mills.
- e) State any two types of motor used in metro rail and mono rail.

P.T.O.

- f) State the meaning of Time of day tariff.
- g) State the types of electric welding system.

2. Attempt any THREE of the following: 12

- a) Explain with neat diagram LED lamp.
- b) Define Tariff and state desirable characteristics of tariff.
- c) Draw simplified speed time curve. Show and list various time periods associated with it.
- d) Derive an expression for design of heating element when heating element used is a circular wire.

3. Attempt any THREE of the following: 12

- a) State Laws of Illumination :-
 - i) Inverse square law
 - ii) Lamberts cosine law.
- b) Explain with neat sketch working of direct arc furnace.
- c) State the factors to be considered for selection of shape and size of elevators.
- d) Describe conductor rail (Third rail) current collection system.

4. Attempt any THREE of the following: 12

- a) State the working principle and application of Dielectric heating.
- b) State the salient features of Bombay Lift Act - 1939.
- c) Compare between urban line, sub-urban line and main line services on following points :-
 - i) Distance between two Railway stations
 - ii) Acceleration
 - iii) Retardation.
 - iv) Maximum speed.

- d) Draw the curve and estimate suitable H.P. of motor having following duty cycle :-
- Rising load from 150 to 500 HP – 6 minutes.
 - Uniform load of 450 HP – 2 minute.
 - Regenerative braking from 100 to zero HP – 2 minute.
 - Idle for – 2 minute.
- e) A 3-phase, 440 V, 50 Hz, 50 kW load has a p.f. 0.80 lagging. Calculate KVAR rating of capacitor required to improve p.f. to 0.95 lagging. What will be value of capacitor per phase, if capacitors are connected in star?

5. Attempt any TWO of the following:

12

- Explain with neat sketch plugging and Rheostatic braking for DC series motor.
- A train runs between two station of 12 Km apart at an average speed of 50 Kmphr. Train acelerates at 3 Kmphps (Km/hr/sec) and retards at 4 Kmphpsec. Assume trapezoidal speed time curve.
Calculate :-
 - Maximum speed
 - Draw speed time curve and mark all
 - Distance travelled by train before the brakes are applied.
- Compare resistance welding and arc welding on the basis of -
 - Supply requirement
 - Voltage
 - Power factor
 - Additional material requirement
 - External pressure
 - Temperature.

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

- a) Draw a neat labeled block diagram of AC electric locomotive. State the function of each part.
 - b) i) Explain with neat sketch Arc welding.
ii) State the methods of Arc stabilization.
 - c) State the need of load equalization in drive. Describe the common method to achieve load equalization in industry.
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