

17507

21819

3 Hours / 100 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 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 :

5 × 4 = 20

- (a) Define Electric drive. State the two advantages associated with electric drives.
- (b) State its eight applications of dielectric heating.
- (c) Compare resistance welding and arc welding on any four points.
- (d) State any four requirements of an ideal traction system.
- (e) Draw simplified speed time curve. Show and list various time periods associated with it.
- (f) Describe the static capacitor method of power factor improvement.
- (g) State any four factors governing selection of a motor for particular application.

2. Attempt any TWO :**2 × 8 = 16**

- (a) (i) Give any four ideal requirements of elevators.
- (ii) State the factors to be considered for selection of shape and size of elevators.
- (b) (i) Compare AC & DC system of track electrification on any four points.
- (ii) A electric train has a schedule speed of 25 km/hr between stations 800 m apart. The duration of stop is 20 seconds, the maximum speed is 20% higher than average running speed and the braking retardation is 3 km/hr/sec. Determine rate of acceleration required to operate the train.
- (c) A 3 ϕ , 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 value of capacitor per phase, if
- (i) capacitors connected in star ?
- (ii) capacitors connected in delta ?

3. Attempt any FOUR :**4 × 4 = 16**

- (a) State types of track electrification system.
- (b) State any one application of each of following :
- (i) Direct resistance heating
- (ii) Indirect induction heating
- (iii) Direct arc heating
- (iv) Dielectric heating

- (c) State one applications of
- (i) Seam welding
 - (ii) Butt welding
 - (iii) Carbon arc welding
 - (iv) Metal arc welding
- (d) Define :
- (i) Luminous Intensity
 - (ii) Lumen
 - (iii) Candle power
 - (iv) MHCP
- (e) State advantages of time off day tariff. (any four)
- (f) Define :
- (i) Average speed
 - (ii) Schedule speed

Also, state the four factors affecting the schedule speed.

4. Attempt any FOUR :

4 × 4 = 16

- (a) Draw fig. of rheostatic braking in case of D.C. series motor and D.C. shunt motor.
- (b) State four advantages of Ajax Wyatt vertical core induction furnace.
- (c) Compare between resistance welding and arc welding on any four points.
- (d) State direct and indirect lighting scheme with one application.
- (e) D.C. series motor is used for traction purpose. Justify your answer with any four characteristics.
- (f) Sketch the various steps required for bridge transition system.

P.T.O.

5. Attempt any FOUR :**4 × 4 = 16**

- (a) State the meaning of load equalization. How is it done ?
- (b) Draw figure of indirect arc furnace. State its two advantages and two disadvantages.
- (c) Give classification of electrical welding.
- (d) State any four factors to be considered while selecting electrical welding system.
- (e) Explain with neat diagram metal halide lamp.
- (f) State any four causes of failure of resistance heating element.

6. Attempt any FOUR :**4 × 4 = 16**

- (a) Derive expression of most economical P.F.
 - (b) Draw neat sketches of series parallel control of traction motors.
 - (c) State types of mechanical power transmission system.
 - (d) State the different methods of temperature control of resistance furnace/oven.
 - (e) A factory has a maximum demand of 250 kW with a load factor of 0.6. The following tariffs are offered :
 - (i) 2 part tariff 70/kW of M.D./year + 4 paise/kWh
 - (ii) A flat rate of 10 paise/kWh.Which tariff is economical ?
 - (f) State the two functions and types of enclosures provided to machine.
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