

- (ii) A motor is coupled to a load having the following characteristics:

$$\text{Motor: } T_m = 15 - 0.5 \omega_m$$

$$\text{Load: } T_L = 0.5 \omega_m^2$$

The stable operating point for this combination is

- (a)  $\omega_m = 5, T = 12.5$
- (b)  $\omega_m = 7, T = 10.5$
- (c)  $\omega_m = 4, T = 14.5$
- (d)  $\omega_m = 3, T = 17.5$

- (iii) Which braking is not possible in a dc series motor?

- (a) Regenerative braking
- (b) Dynamic braking
- (c) Counter current braking
- (d) Rheostatic braking

- (iv) Dynamic braking is employed to brake

- (a) Non reversing drive
- (b) Reversing drive
- (c) both (a) and (b)
- (d) None of the above

- (v) A motor has a thermal heating time constant of 50 minutes. When the motor runs continuously on full load, its final temperature rise is  $80^\circ \text{C}$ , what would be the temperature rise after 1 hour, if the motor runs continuously on full load?

- (a)  $55.9^\circ \text{C}$
- (b)  $58^\circ \text{C}$
- (c)  $56^\circ \text{C}$
- (d)  $60^\circ \text{C}$

- (vi) For a particular motor, the heating time constant usually

- (a) Increases with increase in size
- (b) Decreases with increase in size
- (c) Increases with decrease in size
- (d) None of the above

- (vii) In a single phase semi converter, the average output voltage is given by

$$(a) \frac{1}{\pi} \int_{\alpha}^{\pi} V_m \sin \theta \cdot d\theta$$

$$(b) \frac{1}{\pi} \int_{\alpha}^{\pi} V_m \cos \theta \cdot d\theta$$

$$(c) \frac{1}{\pi} \int_{\alpha - (\pi/2)}^{\alpha + (\pi/2)} V_m \cos \theta \cdot d\theta$$

$$(d) \frac{1}{\pi} \int_{\alpha - (\pi/2)}^{\alpha + (\pi/2)} V_m \sin \theta \cdot d\theta$$

- (viii) The torque during the duty cycle of a motor are

Torque	Duration
240 N-m	20 minutes
140 N-m	10 minutes
300 N-m	10 minutes
200 N-m	20 minutes

What is the equivalent load torque is

- (a) 225 N-m
- (b) 357 N-m
- (c) 458 N-m
- (d) 556 N-m