

**DIPLOMA IN MECHANICAL ENGINEERING
(DME)**

Term-End Examination

December, 2019

00541

BEE-031 : ELECTRICAL TECHNOLOGY

Time : 2 hours

Maximum Marks : 70

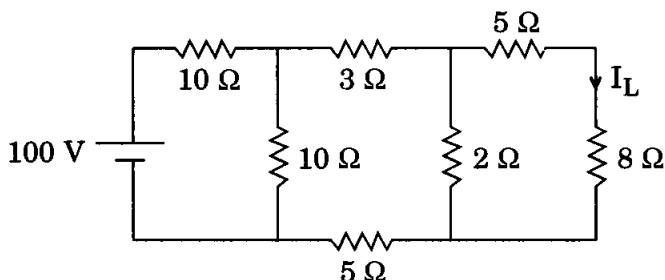
Note : *Question no. 1 is compulsory. Attempt five questions in all. All questions carry equal marks. Use of scientific calculator is allowed.*

1. State *True* or *False* for the following statements :

$7 \times 2 = 14$

- (a) Maximum power is transferred from a source to a load when the load resistance is minimum.
- (b) Starting torque of DC series motor is very high.
- (c) Power can be stepped-up or stepped-down with help of transformer.
- (d) At $S = 1$, torque of induction motor is maximum.
- (e) Synchronous speed (N_s) of synchronous motor is directly proportional to frequency.
- (f) By use of damper winding, effect of hunting can be reduced.
- (g) RMS value is a product of form factor and average value.

2. (a) Explain the following : 7
- (i) Active power
 - (ii) Reactive power
 - (iii) Apparent power
- (b) Explain how power factor can be corrected by a capacitor with the help of phasor diagram. 7
3. (a) State and explain superposition theorem with the help of suitable example. 7
- (b) Find the current (I_L) in the given circuit using Thevenin's theorem : 7



4. (a) Explain three-point starter used for DC shunt motor with neat circuit diagram. 10
- (b) Write the different applications of DC series motor. 4

5. Draw the phasor diagram for single-phase transformer for the following loads :

- (a) Purely resistive load 4
- (b) Inductive or lagging power factor load 5
- (c) Capacitive or leading power factor load 5

Neglect the effect of winding resistance and reactance.

6. (a) Draw and explain torque-slip characteristic of three-phase induction motor. 7
- (b) Differentiate between induction motor and synchronous motor. 7

7. Write short notes on any **two** of the following : $2 \times 7 = 14$

- (a) Instrument Transformer
 - (b) Speed Control of DC Shunt Motor
 - (c) Synchronous Condenser
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