

3010

B. Tech. 1st Sem. (Common for All
Branches) Examination – December, 2018

BASIC ELECTRICAL ENGG.

Paper : ESC-EE-101-G

Time : Three Hours]

[Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all, selecting one question from each Section. Question No. 1 is compulsory. All questions carry equal marks.

1. (a) State and explain Thevenin's theorem. 2.5
- (b) Convert 5A source with its parallel resistance of 20Ω into its equivalent source. 2.5
- (c) Derive an equation for emf induced in transformer. 2.5

SECTION – B

4. (a) In a 25 KVA 2000/200 V transformer the iron and copper losses are 350 W and 400 W respectively. Calculate the efficiency at full load and 0.8 pf lagging. Determine the max efficiency and the corresponding load. 7.5
- (b) Explain the construction and working of an Autotransformer. 7.5
5. (a) Describe the method to measure the power in a three phase circuit using two wattmeters. 7.5
- (b) A 50 KVA, 4400/220 V transformer has $R_1 = 3\Omega$, $R_2 = 0.009\Omega$, $X_1 = 5.2\Omega$ and $X_2 = 0.015\Omega$. Find the equivalent impedances as referred to primary and secondary side. 7.5

SECTION – C

6. (a) Explain the principle of operation of single phase induction motor. 7.5
- (b) Describe the construction and working of synchronous generators. 7.5

- (d) What is the difference between an ideal and practical transformer? 2.5
- (e) What are the methods of providing controlling torque in indicating instruments? 2.5
- (f) Explain the function of commutator in DC machines. 2.5

SECTION - A

2. (a) Explain the loop current method of solving a network. 7.5
- (b) Find the current through 2 Ohm resistance using node voltage method for the circuit shown in Fig- 1. 7.5

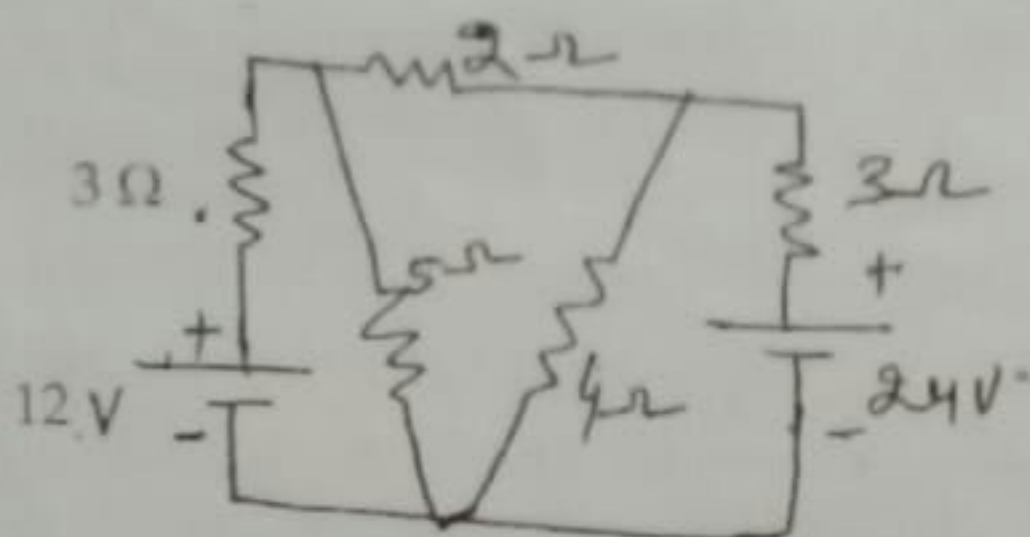


Fig. 1

3. (a) Derive an expression to find the rms value of voltage of a sinusoidal half wave a. c. 7.5
- (b) A resistance of $10\ \Omega$ inductor of $0.5\ \text{H}$ and a variable capacitor is connected in series. Find the capacitance at resonance, voltage across inductance and capacitance. 7.5

7. Describe the functioning of a d.c. motor Draw its labelled diagram. Also draw the torque speed characteristics and explain. 15

SECTION – D

8. Write technical notes on : 15

- (i) Types of wires and cables
- (ii) Power factor improvement
- (iii) Controlling torque in instruments

9. Write notes on : 15

- (i) Switch Fuse Unit
 - (ii) PMMC Instruments
 - (iii) MCB
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