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

Roll No. .....

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 resistence of 20 Ω into its equivalent source. 2.5

   (c) Derive an equation for emf induced in transformer. 2.5

(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

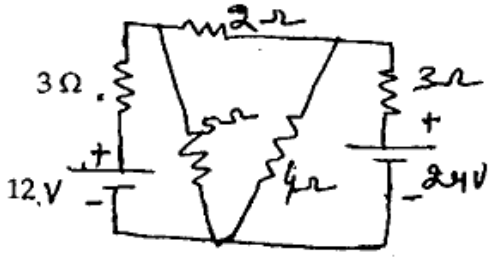

Fig. 1

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 Ω inductor of 0.5 H and a variable capacitor is connected in series. Find the capacitance at resonance, voltage across inductance and capacitance. 7.5

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) A50 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