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Code No: EE1507

GEC-R14

I B. Tech I Semester Supplementary Examinations, November 2017

BASIC ELECTRICAL ENGINEERING

(Computer Science and Engineering)

Time: 3 Hours

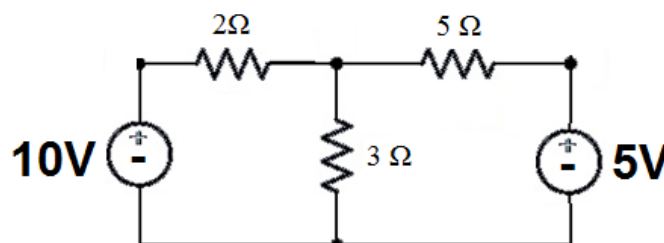
Max. Marks: 60

Note: All Questions from **PART-A** are to be answered at one place.Answer any **FOUR** questions from **Part-B**. All Questions carry equal Marks.**PART-A****6 × 2 = 12M**

1. Explain the terms, Electrical Power and Electrical Energy.
2. Define the terms, time period and frequency of an alternating voltage.
3. What is the mathematical expression for torque equation of D.C.Motor?
4. What is the mathematical expression of induced e.m.f in the transformer?
5. What is the principle of operation of 3- Φ Induction Motor?
6. What is universal motor?

PART-B**4 × 12 = 48M**

1. a) Explain KCL and KVL of an Electrical Circuit. (6M)
- b) Verify superposition theorem for the circuit shown in figure.1. (6M)



2. a) Define the following terms.
 - i) RMS value of an alternating voltage. (2M)
 - ii) Peak factor. (2M)
 - iii) Average value of an alternating voltage. (2M)
- b) Derive mathematical expression for R.M.S value of pure sinusoidal waveform and explain its importance. (6M)
3. Derive the expression for armature torque and shaft torque of DC Motor. (12M)
4. a) Explain the constructional details of 1- Φ transformer. (6M)
- b) A 1- Φ, 50Hz transformer has 75 turns on the primary winding and 375 turns on the secondary winding. The net cross sectional area of the core is 200cm^2 . If the primary winding is connected to 230V, 50 Hz supply. Find
 - i) emf induced in secondary winding.
 - ii) Maximum value of flux density in the core. (6M)

5. a) A 3- Φ Induction motor is wound for 4 poles and is supplied from 50Hz supply. Calculate synchronous speed, rotor speed when slip is 3% and rotor frequency when rotor runs at 650RPM. (6M)
- b) Derive mathematical expression for torque of three-phase Induction Motor. (6M)
6. Explain construction and working principle of stepper Motor. (12M)
