Code No: EE1501 **GEC-R14**

II B. Tech I Semester Regular Examinations, November 2015

ELECTRICAL AND ELECTRONICS ENGINEERING

(Mechanical 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

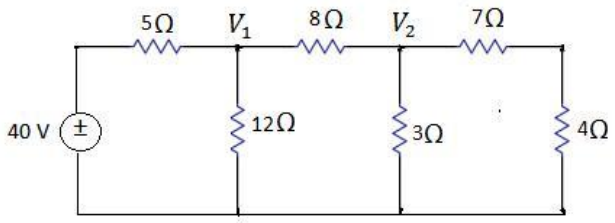
6 × 2 = 12M

1. In a circuit 2 inductors with inductances 3 H and 4 H respectively are connected in parallel. What is their equivalent inductance?
2. Explain the function of a commutator in a D.C. Machine.
3. What is the principle of operation of a transformer?
4. If the load on an Induction Motor increases, explain what happens to the slip?
5. Why single Phase Induction Motor is not self starting?
6. Mention the applications of universal motors.

PART-B

4 ×12 = 48M

1. a) Find the voltage 'V_1' in the circuit shown below using KCL. (6M)



   b) Derive the equation for equivalent capacitance of 'N' numbers of capacitors connected in series. (6M)

2. a) Derive the torque equation of a D.C.Motor and give the applications of different types of D.C.Motors. (6M)
   b) A separately excited generator with constant excitation is connected to a load (constant). When the speed is 1200 rpm it delivers 120 A at 500 V. At what speed will the current reduced to 60 A. Armature resistance is 0.1 ohm. Armature reaction may be ignored. (6M)

3. a) Mention the various losses in a transformer and hence derive the condition for maximum efficiency. (6M)

b) A 5 KVA, 200 / 400 volts, 50 Hz, single phase transformer has iron loss of 150 W and full load copper loss of 220 W. Calculate the efficiency of the transformer at 75 % full load at 0.8 power factor (lagging). (6M)

4. a) Explain the operation of a 3-phase induction motor. (5M)

   b) Explain in detail any one method of starting a single phase induction motor. (7M)

5. What is a Servo Motor? Explain the operation of A.C. Servo Motor. (12M)

6. a) Explain the operation of full wave rectifier with the help of a circuit diagram. (5M)

   b) Explain the circuit diagram of a common emitter amplifier & explain its input and output characteristics. (7M)

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