EE-201/1860

B. Tech (Semester-II) Exam.–2014

Electrical Engineering

Time: Three Hours

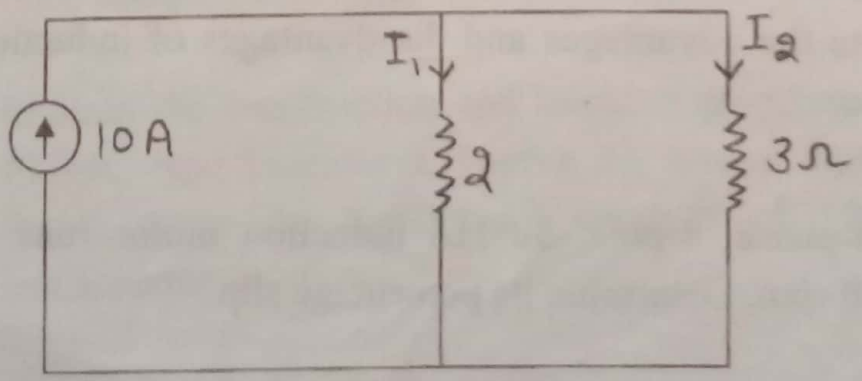
Maximum Marks: **100**

Note: Attempt questions from all the sections.

Section –A

Note: Attempt any ten questions. Each question carries 4 marks. **(4x10=40)**

1. Explain Kirchhoff's laws with examples.
2. Explain Nodal analysis.
3. Explain Thevenin's theorem.
4. Explain maximum power transfer theorem.
5. Calculate I_1 & I_2.



6. Discuss the advantages & disadvantages of synchronous motor.

7. Explain the working principle of single phase transformer.

8. Discuss the errors in dynamometer type instruments.

9. Explain magnetic hysteresis.

10. State the difference between an ideal & practical transformer.

11. Derive the expression for D.C. generator.

12. Write the applications of D.C. motor.

13. Write the advantages and disadvantages of induction motor.

14. A 3-phase, 4-pole, 50 HZ induction motor runs at 1460 rpm. Determine its percentage slip.

15. A coil of 300 turns, wound on a core of non-magnetic material, has an inductance of 10 mH. Calculate:
    (i) The flux produced by a current of 5A.
    (ii) The average value of emf induced when a current of 5A is reversed in 8 milliseconds.

Section –B

Note: Attempt any three questions. Each question carries 20 marks. (20x3=60)

1. State, explain and prove superposition theorem. State its applications and limitations.

2. Explain active power, reactive power and apparent power and their applications in a single phase ac circuit. Also derive the expression for power in an ac circuit.

3. Explain efficiency of a transformer. Hence derive the condition of maximum efficiency of a transformer. Also compare efficiency with power factor.

4. Explain the construction and working principle of a PMMC type instrument. Derive the torque equation for it. State the merits and demerits of PMMC instruments.

5. A coil of resistance 40 Ω and inductance 0.75 H forms part of a series circuit for which resonant frequency is 55 Hz. If the supply is 250V, 50Hz, find:

(i) Line Current

(ii) Power Factor

(iii) Power Consumed

(iv) Voltage across the Coil

6. A 3-phase delta connected 440 volts, 50 Hz, 4-pole induction motor has a rotor stand still emf per phase of 130 volts. If the motor is running at 1440 rpm. Calculate for this speed.

(i) The slip

(ii) The frequency of rotor induced emf

(iii) The value of the rotor induced emf per phase

(iv) Stator to rotor turn ratio

EE-101/1846

B. Tech. (Semester-I) Examination-2014

Electrical Engg

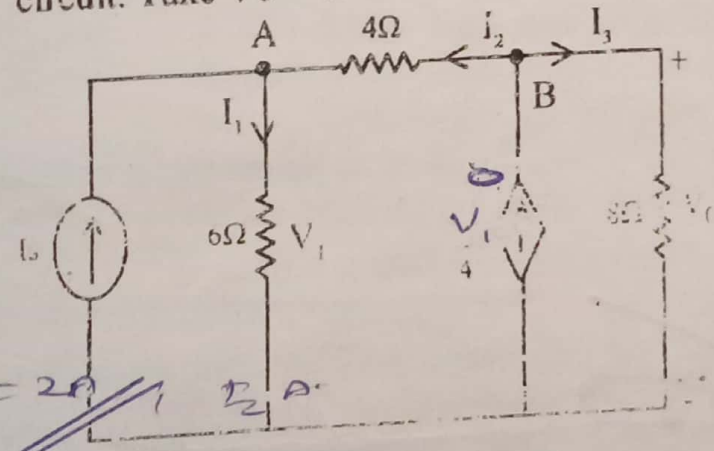
Time: Three Hours] *[Maximum Marks:* **100**

Note: Attempt questions from all the sections.

Section-A

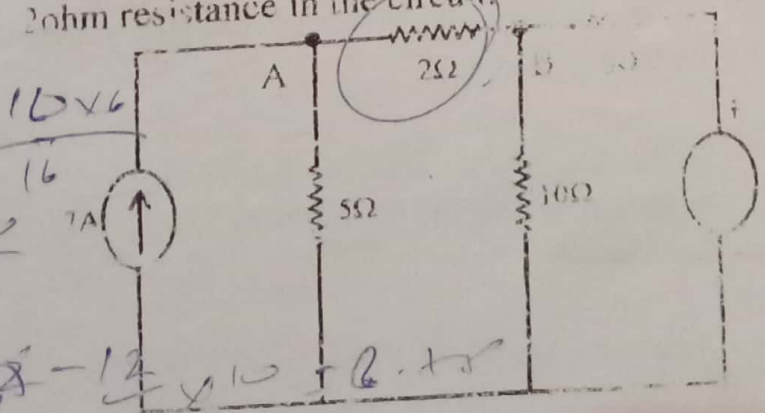
Note: Attempt any ten questions. Each question carries 4 marks. **(4x10=40)**

1. Applying Kirchhoff's current law, determine is in electric circuit. Take Vo = 16V



2. Differentiate between Active and Passive element.

3. Using Thevenin's theorem, determine current and voltage in 2ohm resistance in the circuit.



4. A alternating current is given by i=20 Sin 600 t amperes Find:
   (i) Frequency
   (ii) Peak value of current
   (iii) Time taken from t=0 for current to reach a value of 10A.

5. Define form factor and peak factor

6. A circuit consists of 20Ω resistance in series with capacitance of 200μf, connected across 50Hz supply. The current through circuit is 10.8 Sin 314t amperes. Determine voltage across each component and across the ckt.

7. A 3 phase balanced load draws 10 kw power from 400 V, 3-θ, 50Hz, 4-wire supply at .8 logging power factor

   (i) Determine line current

   (ii) Line current is power factor equal unity.

8. Determine transformer efficiency.

9. A 3-θ slip ring 4- pole inductor motor has rotor frequency of 20 Hz while connected to 400V, 3ϕ, 50 Hz supply. Determine slip and rotor speed.

10. Obtain equivalent Y from Δ Y-Δ transformation.

11. Why the stator winding of alternator is generally star connected?

12. Why we never discuss apparent power, active power and reactive power in dc circuit? Give relationship b/w them in a.c circuit.

13. What are merits of PMMC instruments?

14. A full scale deflection current of a meter is 1mA and its internal resistance is 100Ω. If this meter is to have full scale deflection when 100V is measured. Find value of series resistor.

15. Explain why power in ac circuit cannot be measure by ammeter and voltmeter.

Section-B

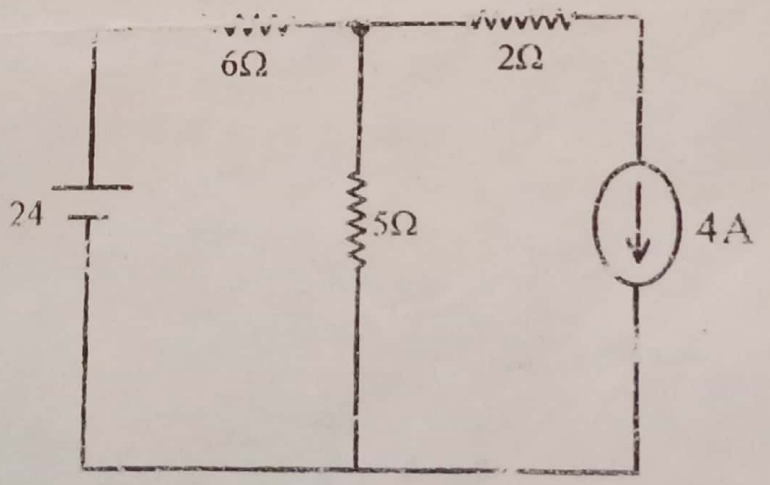
Note: Attempt any three questions. Each question carries equal marks. **(20x3=60)**

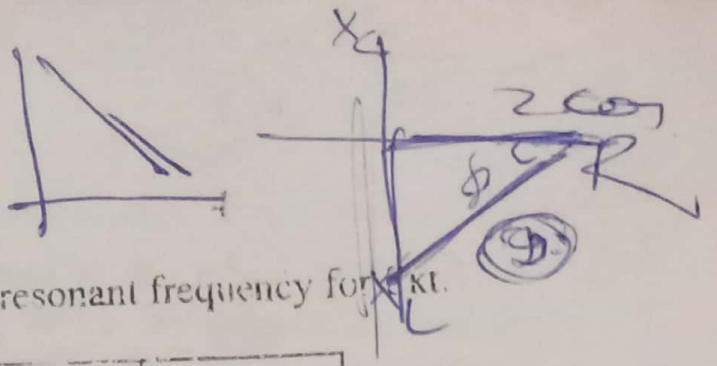
1. (a) A 600 KVA 1-ph has an efficiency of 92% both at full load and half-full-load at unity power factor. Determine its efficiency at 60% of full load at .8 pf Log.

   (b) Define Nortons theorem.

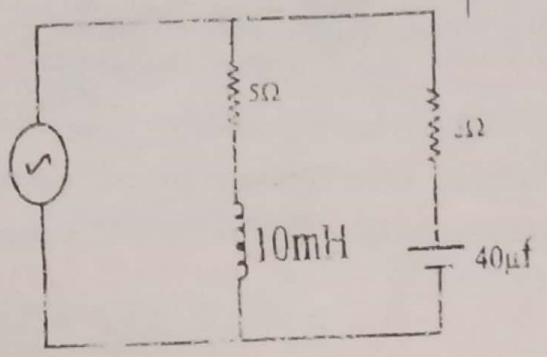
2. (a) Draw Torque Slip and Torque Speed Curves.

   (b) Find current I in the Ckt.





3 (a) Find resonant frequency for the ckt.



(b) What is Q-factor of parallel resonant Ckt?

4. (a) Write main characteristic of synchronous motor.

(b) A 3 ϕ 440 V, 50 hp, 50 Hz induction motor runs at 1450 rpm when its delivers rates output power. Determine

(i) Numbers of poles of machine
(ii) Frequency of rotor current
(iii) Speed of rotating air gap field

5 (a) Differentiate between squirrel cage induction motor and slip ring induction motor.

(b) A coil has resistance of 10Ω and draw current of 5A when connected across 100V, 50 Hz sources. Determine reactive power of the Ckt

6 Use ~~nodal analysis~~ to find current in various resistors of the Ckt shown.