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Code No: X0122 **R07** SET - 1

II B. Tech I Semester, Supplementary Examinations, Nov – 2012
ELECTRICAL AND ELECTRONICS ENGINEERING
(Com. to CE, ME, AME)

Time: 3 hours Max. Marks: 80

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. An inductive coil having a resistance of 5 ohms and an inductance of 0.03 H is connected in parallel with a resistance of 10 ohms and a condenser of 200 μF to a 100 V, 50 Hz supply. Find the current in each element. (16M)

2. a) Explain the principle of operation of DC generator.
   b) A 220V machine has an armature resistance of 0.5Ω. If the full load armature current is 20A, find the induced e.m.f when the machine acts as i) generator ii) motor. (8M+8M)

3. a) Derive the condition for maximum efficiency of a transformer.
   b) A 5 KVA, 200/100 V, 1 phase, 50 Hz has a rated secondary voltage at full load. When the load is removed the secondary voltage is found to be 110V. Determine percentage regulation. (8M+8M)

4. a) Establish a relationship between the number of poles, frequency and synchronous speed for a three phase alternator.
   b) Discuss about the applications of Induction motors. (8M+8M)

5. Explain the working principle of Moving Iron type instruments with neat diagram. (16M)

6. a) Draw the circuit diagram of full wave rectifier having two diodes and explain its operation.
   b) Explain the operation of p-n junction diode and draw its characteristics. (8M+8M)

7. a) Draw typical output characteristics of CC configuration of a NPN transistor and explain.
   b) Draw V-I characteristics of SCR and explain. (8M+8M)

8. Explain the operation of a CRO with a neat block diagram. (16M)

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Code No: X0122 **R07** SET - 2

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Time: 3 hours Max. Marks: 80

Answer any **FIVE** Questions
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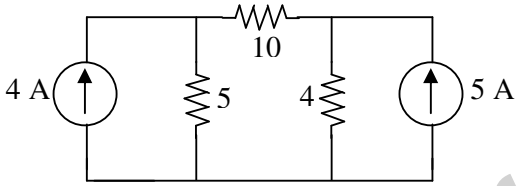
1. a) Sate and explain the Kirchhoff's voltage law with the help of an example.
   b) For the circuit shown below, find the power dissipated in 5 ohms resistor. All resistances values are in ohms. (8M+8M)



2. a) Explain the applications of different types of D.C. motors.
   b) Derive the e.m.f equation for DC generator. (8M+8M)

3. a) Define the voltage regulation of a transformer. What is its significance?
   b) Enumerate the various losses in a transformer. How these losses are minimized. (8M+8M)

4. a) Explain the Torque-Slip characteristics of an induction motor.
   b) Explain the working principle of 3-phase alternator.

5. Explain the working principle of Moving Coil type instruments with a neat diagram. (16M)

6. a) Explain the operation of a centre-tap full-wave rectifier with input and output waveforms.
   b) In a centre-tap circuit having input voltage 250V using step down transformer having turns ratio 4:1, the diodes are assumed to be ideal. Find i) dc output voltage ii) peak inverse voltage. (8M+8M)

7. a) Draw the structure of P-N-P transistor and explain its operation. Also draw its characteristics.
   b) What are the SCR applications (10M+6M)

8. Write a short note on: i) Electrostatic Deflection ii) Electromagnetic Deflection. (8M+8M)

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Code No: X0122 **R07** SET - 3

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Time: 3 hours Max. Marks: 80

Answer any **FIVE** Questions
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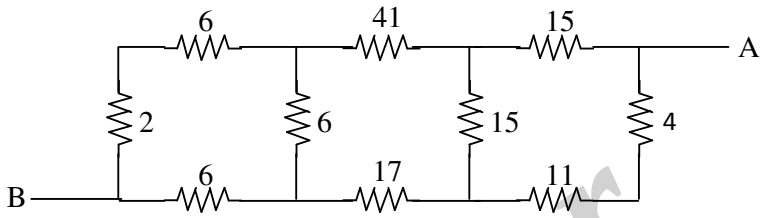
1. a) State and explain ohm's law. What are its limitations?
   b) Find the resistance between A and B for the circuit shown below. All resistance values are in ohms. (8M+8M)



2. a) What are the various types of DC motors and explain them with suitable diagrams.
   b) Explain the principle of operation of DC-Generator (8M+8M)

3. a) Explain the terms efficiency and voltage regulation of the transformer.
   b) The maximum flux density in the core of a 250/3000 V, 50 Hz single-phase transformer is 1.5 Wb/m^2. If the e.m.f per turn is 6 volt, determine i) Primary and secondary turns
   ii) Area of the core. (8M+8M)

4. a) Explain the working principle of 3 phase induction motor.
   b) An 8 pole induction motor is fed by three phase 50 Hz supply and running with a full load slip of 4%. Find the full load speed of induction motor and also the frequency of rotor e.m.f. (8M+8M)

5. Explain the basic principle of indicating instruments and explain the operation of PMMC instruments? (16M)

6. Explain the operation of a bridge rectifier with neat diagram and output waveforms. (16M)

7. Draw the structure of N-P-N transistor and explain its operation. Also draw its characteristics. (16M)

8. a) Explain the magnetic deflection and electrostatic deflection used in CRO?
   b) Discuss the applications of CRO. (8M+8M)

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Code No: X0122 **R07** SET - 4

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Time: 3 hours Max. Marks: 80

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1. a) Derive the relationship to express three star connected resistances into equivalent delta connection.
   b) Explain about series circuits and parallel circuits with examples. (9M+7M)

2. a) Explain the functions of important parts of a three point starter.
   b) What are the types of DC generators (10M+6M)

3. a) Explain the principle of operation of a transformer under load and no-load conditions.
   b) Show that the maximum efficiency of a transformer occurs when the iron losses are equal to copper losses. (7M+9M)

4. a) Explain the procedure to determine the regulation by synchronous impedance method.
   b) Explain the principle of operation of induction motor (10M+6M)

5. a) What are the essential requirements of Indicating Instruments?
   b) Explain the advantages and disadvantages of MI instruments. (8M+8M)

6. a) Explain how p-n junction diode acts as a rectifier.
   b) Draw the circuit diagram of half wave rectifier and explain its operation. (8M+8M)

7. a) Explain the operation of SCR and draw its V-I characteristics.
   b) Explain the operation of transistor as an amplifier. (8M+8M)

8. Explain the applications of CRO with respect to voltage and frequency measurement. (16M)

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