

II B.TECH - I SEMESTER EXAMINATIONS – MAY, 2011
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(BIOTECHNOLOGY)

Time: 3hours

Max. Marks: 75

Answer any FIVE questions
All Questions Carry Equal Marks

- 1.a) State and explain Kirchoff's laws.
 b) In the circuit given below Figure 1 find the current through $5\ \Omega$ resistor. [7+8]

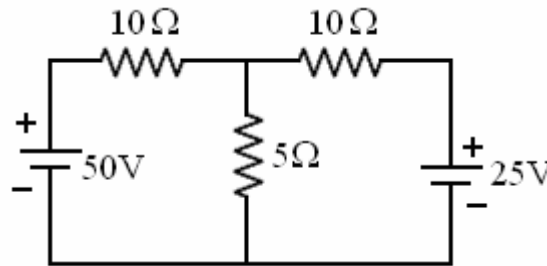


Figure 1

- 2.a) Find the impedance between terminals A and B in the following circuit (Figure 2).

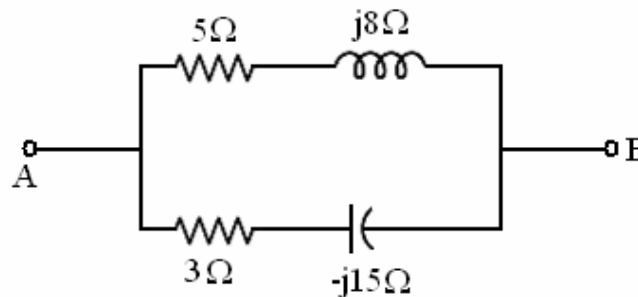


Figure 2

- b) Derive expression for current, power when A.C. voltage is applied across pure inductor. [7+8]
3. A balanced three phase load $25-j30\ \Omega/\text{phase}$ is star connected across, 440V three phase supply. Determine phase currents phase voltages, total power dissipated. Also draw the phasor diagram. [15]
4. Explain with diagram the constructional details of DC machine. [15]
5. Draw the constructional details of Dynamometer type instruments. Also explain its operation. [15]
6. Draw the circuit diagram to obtain V-I characteristics of PN junction diode. Also explain the procedure of obtaining V-I characteristics. [15]
7. Explain the working of p-n-p and n-p-n transistors and explain how a transistor can work as amplifier. [15]
8. Obtain the truth table for full adder also draw the logic circuit. [15]

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- 1.a) Compare Linear & Non – Linear Elements.
- b) In the circuit given below Figure 1, calculate the current supplied by each source.

[7+8]

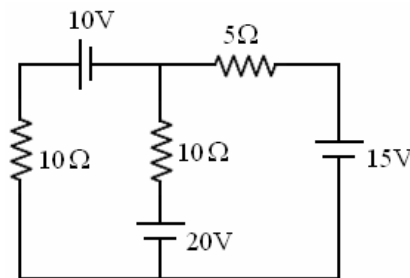


Figure 1

2. In the circuit given below Figure 2, calculate power, current supplied by the source. Also determine the power factor. All impedances are in Ohms. [15]

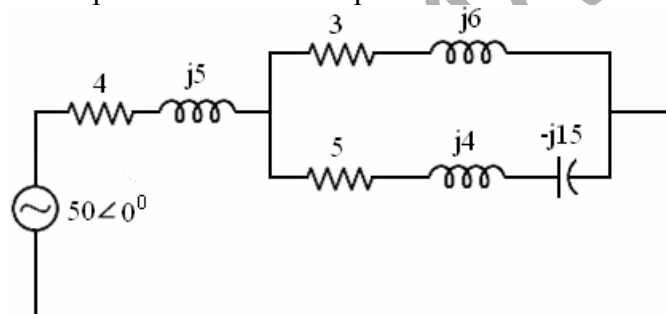


Figure 2

3. Derive the relationship between line and phase voltages and currents in a balanced three phase star connected system. Also derive expression for three phase power. [15]
4. Draw the constructional details of synchronous motor. Also explain its principle of operation. [15]
5. Draw the constructional details of PMMC instruments also explain the principle of operation. [15]
- 6.a) Write short notes on P – type semiconductor, N – type semiconductor.
- b) Draw the circuit diagram of half-wave rectifier, and explain its principle of operation. [7+8]
7. What is CB configuration for a transistor? Sketch family of CB output characteristics for a transistor. [15]
8. Design 3 – Bit binary counter using T – Flip Flop. [15]

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1. By means of mesh current analysis obtain the current supplied by each source in the following circuit (Figure 1). [15]

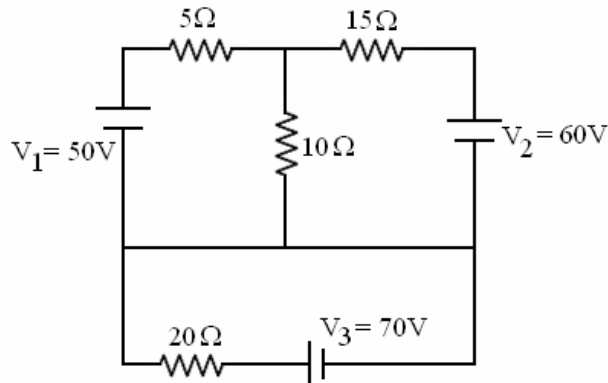


Figure 1

- 2.a) Define RMS & Average values of an AC quantity.
 b) In the circuit given below Figure 2, find the power delivered by the source. All the impedances are in Ohms. [7+8]

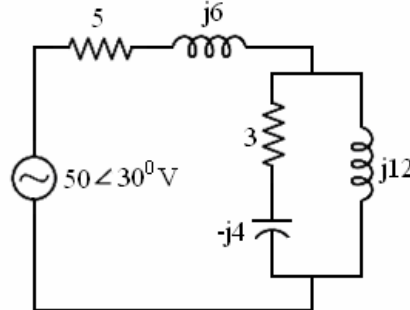


Figure 2

3. In the circuit given below (Figure 3), determine line & phase currents. Also draw the phasor diagram. The supply is three phase 220V. All the impedances are in Ohms. [15]

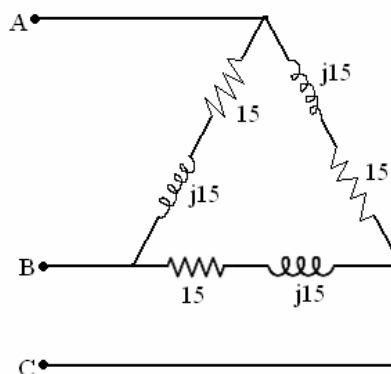


Figure 3

4. Explain in detail the principle of operation of single phase transformer
 - a) On no load
 - b) On lagging load.[15]
5. With the help of diagram explain the principle of operation of Moving Iron instruments. [15]
- 6.a) What is a P-N junction? Describe the action of PN Junction when it is
 - i) Forward Biased
 - ii) Reverse Biased
 - b) Explain the working of zener diode.[8+7]
7. Draw the circuit diagram for CE configuration of a transistor. Also explain how to obtain CE characteristics. [15]
8. Draw the logic diagram of J – K flip flop and obtain its excitation table. [15]

FIRSTRANKER

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1. By means of node voltage analysis obtain the current through $15\ \Omega$ resistor in the following circuit (Figure 1). [15]

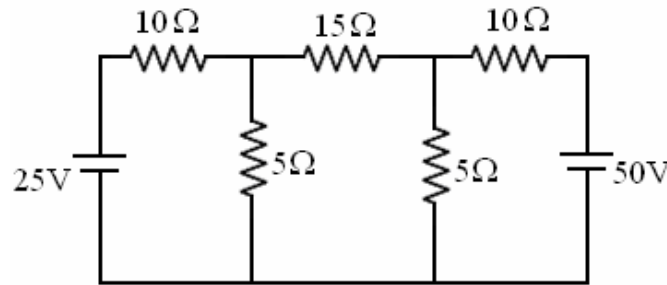


Figure 1

- 2.a) Derive expression for rms value of half wave rectified sine wave voltage.
 b) For the circuit given below Figure 2 obtain the equivalent impedance between terminals A and B. Also obtain power factor. [7+8]

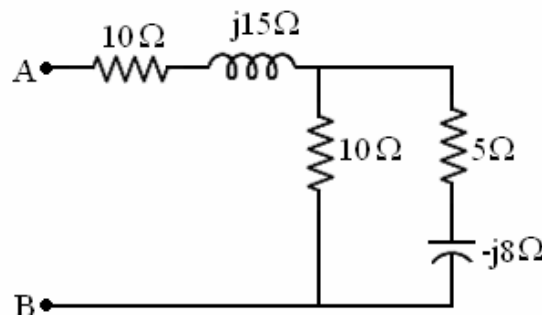


Figure 2

3. Derive the relationship between line and phase voltages and currents in a balanced three phase delta connected system. Also derive expression for the total power. [15]
4. Draw the constructional details of three phase induction motor. Also explain the principle of operation. [15]
5. Draw the Induction type energy meter diagram also explain the principle of operation. [15]
6. Explain
 a) Intrinsic semiconductors b) Extrinsic semiconductors [15]
- 7.a) Draw the FET amplifier circuit, also explain the procedure of obtaining its characteristics.
 b) Explain speed control of motor using feedback. [8+7]
8. Simplify the following Boolean function using algebra method
 $F(A, B, C, D) = \overline{A}CD + \overline{A}BC + ABCD + CD + \overline{B}C\overline{D}$ [15]
