INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

B.Tech II Semester End Examinations (Regular/Supplementary) - May, 2018

Regulation: IARE – R16

FUNDAMENTALS OF ELECTRICAL AND ELECTRONICS ENGINEERING

Time: 3 Hours   (Common to CSE | IT)   Max Marks: **70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Determine the current through 6Ω resistor and the power supplied by the current source for the circuit shown in Figure 1.   **[7M]**
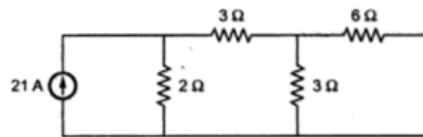

Figure 1

(b) Differentiate the following elements with examples   **[7M]**
    i. linear and non-linear elements
    ii. active and passive elements

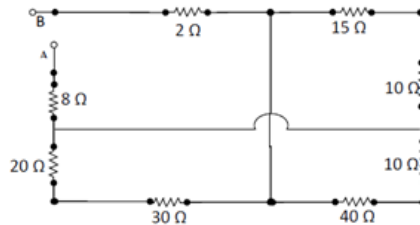2. (a) Find the equivalent resistance between A and B in the network shown in Figure 2.   **[7M]**

Figure 2

(b) The current in the 6Ω of the network is 2A. Determine the currents in all the resistances and the supply voltage V as shown in Figure 3.   **[7M]**
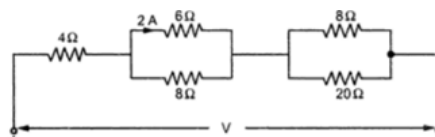

Figure 3

UNIT – II

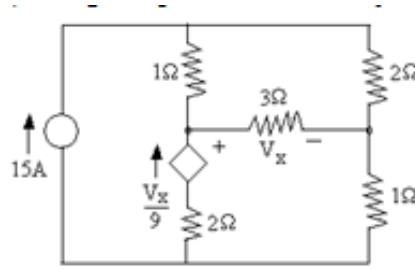3. (a) Using loop method of analysis, determine the current in 2Ω resistors as shown in Figure 4. **[7M]**

Figure 4

(b) For the network shown in Figure 5, select a tree with branches having resistances 3Ω and 4Ω.
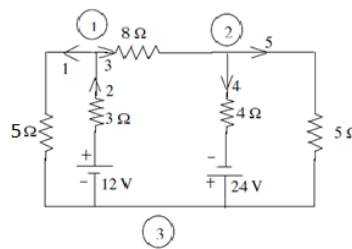
[7M]

Figure 5

4. (a) State and explain compensation theorem with suitable example. **[7M]**

(b) Find R_{AB} required to be connected across A-B terminals for a maximum power transfer shown in Figure 6. Also calculate maximum power. **[7M]**
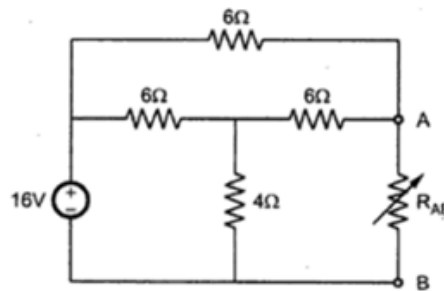

Figure 6

UNIT – III

5. (a) Give the steady state response of series RL circuit using sinusoidal input. **[7M]**

(b) Derive the relationship between line and phase voltages and currents in star connection. **[7M]**

6. (a) Derive the expression for measurement of power and power factor of a balanced three phase load. **[7M]**

(b) A three phase balanced system supplies 110V to a delta connected load whose phase impedances are equal to (3.54+j3.54) Ω. Determine the line currents. **[7M]**

UNIT – IV

7. (a) Explain the working of bridge rectifier with neat suitable diagram. **[7M]**

   (b) A voltage of 200 cos ω t is applied to half-wave rectifier with load resistance of 5kΩ.Find the maximum dc current component, rms current, ripple factor and efficiency. **[7M]**

8. (a) Explain the working of Zener diode act as a voltage regulator. **[7M]**

   (b) Derive the expression for I_{dc}, I_{rms} and ripple factor for half-wave rectifier. **[7M]**

UNIT – V

9. (a) Explain the operation of NPN transistor. **[7M]**

   (b) Draw and explain the input and output characteristics of common emitter configuration. **[7M]**

10. (a) Explain the operation of transistor as an amplifier. **[7M]**

   (b) A transistor has β =100.If the collector current is 40 mA, find the value of emitter current. **[7M]**

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