

**University of Asia Pacific**  
**Department of Civil Engineering**  
**Semester Final Examination, Spring- 2012**  
**Program: B.Sc. Engineering (2<sup>nd</sup> Year / 1<sup>st</sup> Semester)**

**Course Title: Basic Electrical Engineering**      **Course Code: ECE 201**      **Credit: 3.00**

**Time: 3.00 Hours**

**Full Marks: 150**

**[There are eight questions. Answer any six. Figures in the right margin indicate marks]**

1. (a) What is passive sign convention? Explain with example. [10]
- (b) State the following laws: [9]
  1. Ohm's Law
  2. Kirchhoff's Voltage Law (KVL)
  3. Kirchhoff's Current Law (KCL)
- (c) What is loop and mesh? [6]
2. (a) Use Nodal analysis to find 'i' in the circuit shown in Fig.2(a) [15]
- (b) What is the difference between node and super node? Draw a network containing super node. [10]

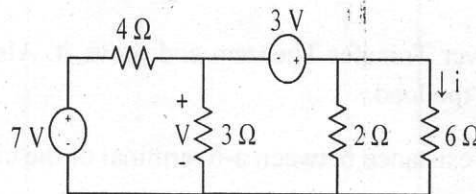


Fig: 2(a)

3. (a) Draw a network containing a super mesh. [7]
- (b) Using Mesh Circuit analysis find V in the circuit shown in Fig.3(b) [18]

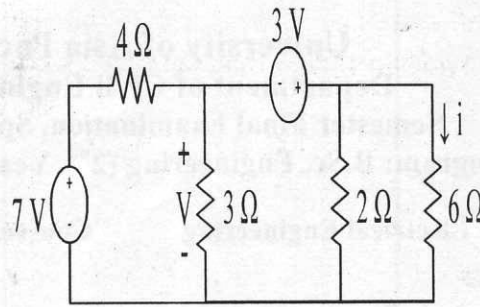


Fig. 3(b)

4. (a) State Thevenin's Theorem. [5]
- (b) Find Thevenin's equivalent circuit to the left of a-b terminal of circuit shown in Fig. 4(b). [20]
- Using your Thevenin's equivalent circuit find current through  $R_L$  when  $R_L = 6, 16$  and  $36\Omega$ .

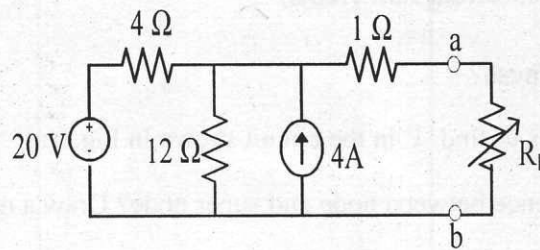


Fig. 4(b)

5. (a) State Maximum Power Transfer Theorem and prove it. Also find the expression of maximum [12]  
power transferred to the load.
- (b) Find the equivalent resistance between a-b terminal of the circuit shown in Fig 5(b). [13]

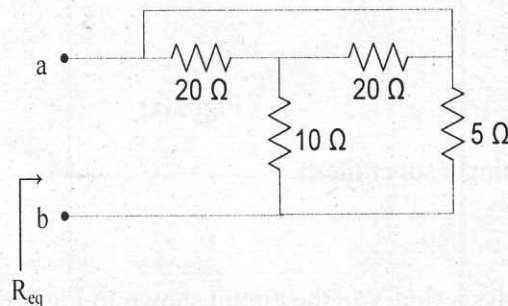


Fig.5(b)

6. (a) State superposition theorem. [5]

(b) Using superposition principle find I from the circuit shown in Fig .6(b)

[20]

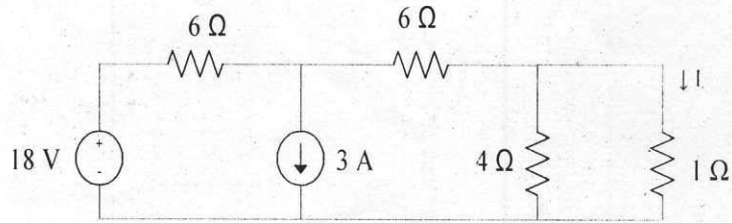


Fig. 6(b)

7 (a) What do you understand by short and open circuit conditions?

[8]

(b) Using series/parallel combination find the equivalent resistance as indicated in the figure 7(b) [17]

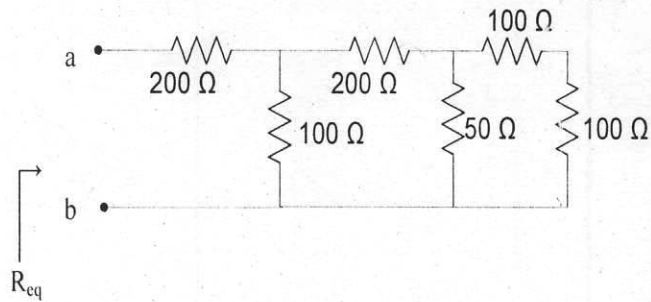


Fig. 7(b)

8 (a) Calculate the phase angle between  $V = 10 \cos (\omega t + 50^\circ)$  and  $I = 12 \sin (\omega t - 10^\circ)$ . Draw the corresponding waveform & also state which sinusoid is leading.

[12]

(b) Find the following parameters from the graph shown in the fig. 8(b)

[13]

i) Amplitude ii) Time period iii) Frequency iv) Angular frequency

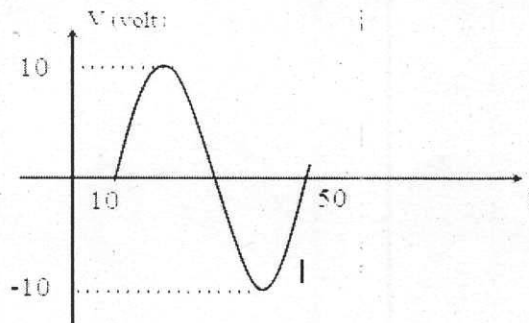


Fig. 8(b)