

- Note:** i) Question paper consists of Part A, Part B.  
 ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.  
 iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART – A**

**(25 Marks)**

- 1.a) Define Node and Mesh of a circuit. [2]
- b) What are the duality of inductor and mesh? [3]
- c) How capacitor behaves during steady state? [2]
- d) What is forced response? Give example. [3]
- e) What is impedance? [2]
- f) What is the difference between active and reactive power? [3]
- g) What is phase plot? [2]
- h) What is the importance of transfer function? [3]
- i) Define open circuit input impedance. [2]
- j) What are hybrid parameters? [3]

**PART – B**

**(50 Marks)**

- 2.a) What is reciprocity theorem? Discuss.
- b) Using Norton's theorem, determine the voltage across 5 ohm in the circuit below. (figure 1) [5+5]

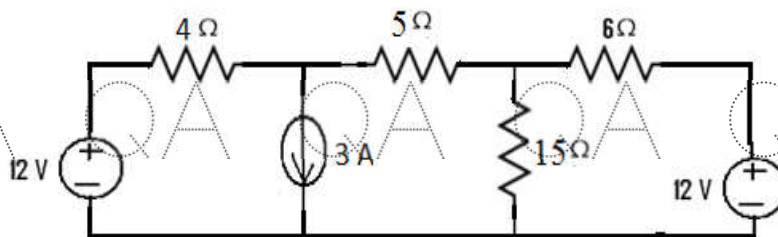


Figure 1

**OR**

- 3.a) State and explain Maximum power transfer theorem.
- b) Using Superposition theorem, determine the voltage across 5A current source in the circuit below. (figure 2) [5+5]

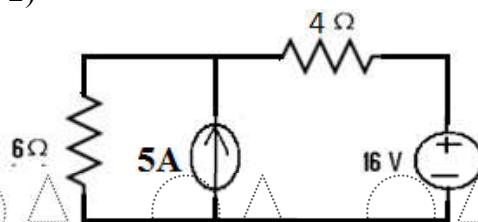
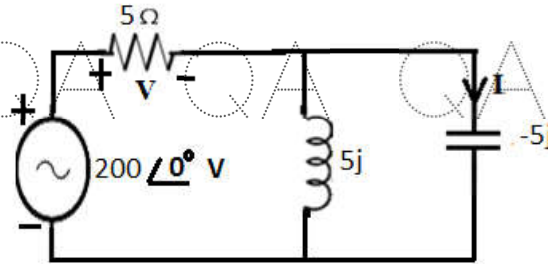


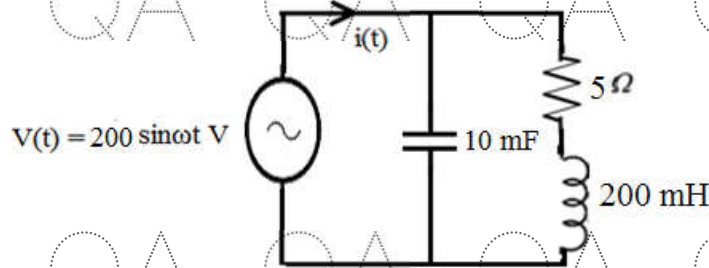
Figure 2

- 4.a) Derive the transient response of series RC circuit for sinusoidal excitation.  
 b) Derive the transient response of series RLC circuit for DC excitation. [5+5]
- OR**
- 5.a) Derive the transient response of parallel RLC circuit for sinusoidal excitation.  
 b) Derive the transient response of series RL circuit for DC excitation. [5+5]
- 6.a) Discuss about the representation of sine function as rotating phasor.  
 b) For the circuit shown in the figure 3 below, Find V and I. [5+5]



**Figure 3**

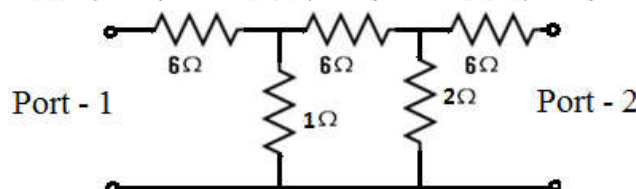
- OR**
- 7.a) What are the properties of ideal transformer? Explain.  
 b) A relay coil is connected to a 100V, 50 Hz supply. If it has a resistance of 5 Ω and an inductance of 0.75 H, calculate the apparent power and power factor. [5+5]
- 8.a) What is inverse Laplace transform? Explain with an example.  
 b) In the circuit shown below, find the value of resonant frequency for which V(t) and i(t) are in phase. (figure 4). [5+5]



**Figure 4**

**OR**

- 9.a) What is a transformed network? Explain.  
 b) How to determine poles and zeros from a transfer function? Explain with an example. [5+5]
- 10.a) Derive the relationship between impedance and transmission parameters.  
 b) Determine impedance parameters of the two port network below. (figure 5) [5+5]



**Figure 5**

**OR**

11.a) Discuss about the parallel connection of two port networks.

b) Determine hybrid parameters of the two port network below. (figure 6)

[5+5]

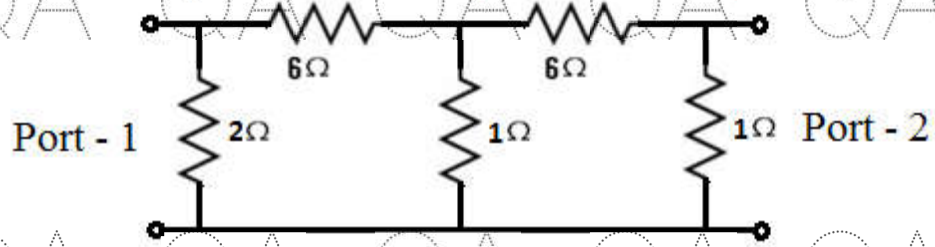


Figure 6

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