B.Tech II Year II Semester (R13) Supplementary Examinations May/June 2017

**NETWORK ANALYSIS**

(Electronics & Communication Engineering)

Time: 3 hours Max. Marks: 70

**PART - A**

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) State Tellegen's theorem.

(b) Define 'Tree' of a graph.

(c) Define time constant of RL circuit.

(d) What is the difference between average power and apparent power?

(e) Define 'Q' factor.

(f) What is an ideal transformer?

(g) What are the advantages of state variable approach?

(h) Express $Z_{22}$ in terms of Y – parameters.

(i) List any two properties of symmetrical network.

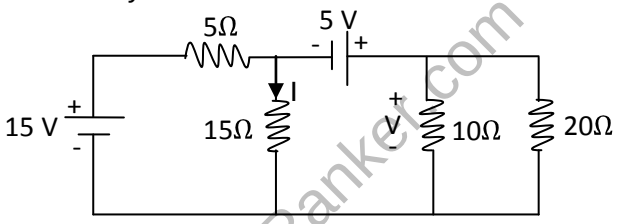
(j) Define neper.

**PART - B**

(Answer all five units, 5 X 10 = 50 Marks)

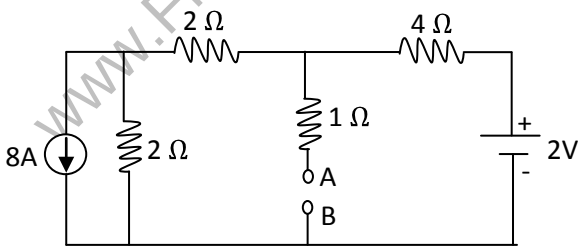
**UNIT - I**

2 Find V and I using mesh analysis.




**OR**

3 Obtain the Thevenin's equivalent for the given circuit.

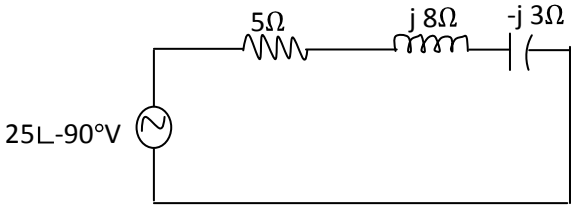



**UNIT - II**

4 An RL series circuit with $R = 300\ \Omega$ and L = 1H has a sinusoidal voltage $v = 100\cos(100t + \phi)$ volts. If the switch is closed when $\phi = 45°$, obtain the resulting current i(t).

**OR**

5 For the circuit shown in the figure below, determine power factor, average & apparent power.

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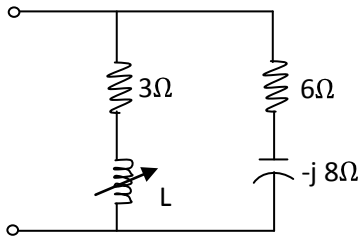
**UNIT - III**

6 A series RLC circuit with R = 30 Ω, L = 0.5H results in a leading phase angle of 60° at a frequency of 50 Hz. At what frequency will the circuit be resonant?

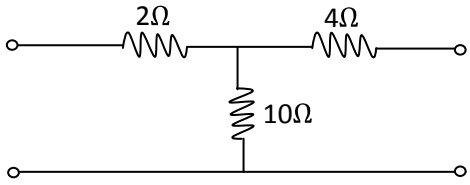
**OR**

7 Determine the value of L for which the circuit shown in figure below is resonant at a frequency of $W = 10{,}000\ rad/sec$.



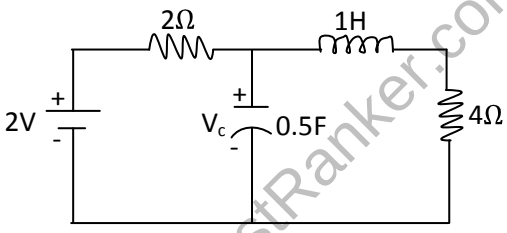

**UNIT - IV**

8 Find the h-parameters for the network shown in figure below.




**OR**

9 Write the state equation for the circuit shown in figure below.




**UNIT - V**

10 Design a constant – K low pass filter, both T and $\pi$ sections having a cut-off frequency of 2 kHz to operate with a terminated load resistance of 500 Ω.

**OR**

11 Design a m-derived high pass filter with a cut off frequency of 10 kHz, design impedance of $600\ \Omega$ and m = 0.3.

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