B.E.(with Credits)-Regular-Semester 2012-Instrumentation Engineering Sem. III

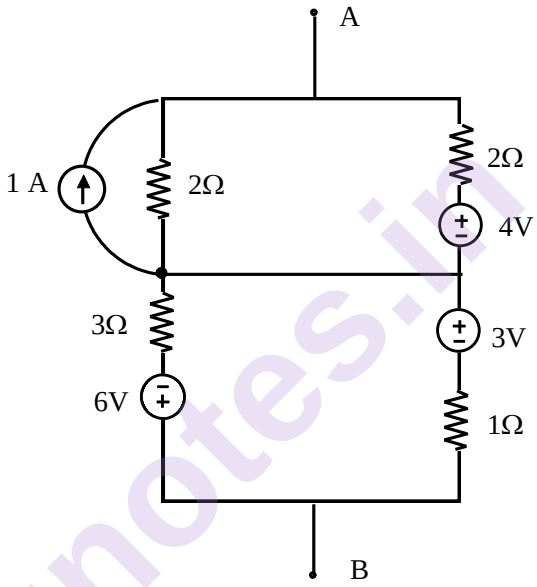
IN 303 - Network Theory

P. Pages : 4 **GUG/W/16/3782**

Time : Three Hours * 3 6 2 7 * Max. Marks : 80

Notes : 1. Same answer book must be used for each section.
2. All questions carry marks as indicated.
3. Assume suitable data wherever necessary.
4. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Reduce the network to a form with only one current source across terminals A B. **8**

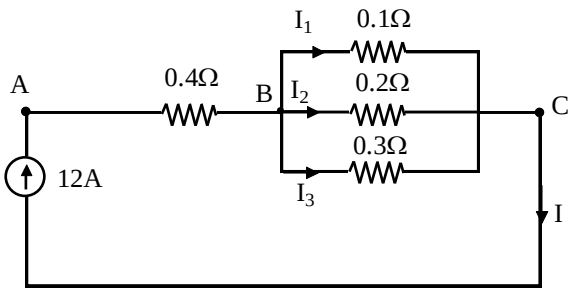


b) Define: **2**
i) Link ii) Tree

c) Define Resistance, inductance and capacitance parameters and their relation with voltage and current. **6**

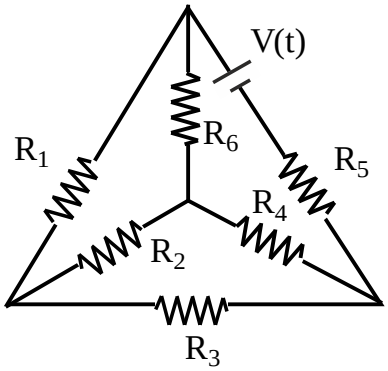
OR

2. a) Calculate the values of different currents for the circuit shown below what is the total circuit conductance and resistance? **8**



b) For the network shown in fig. **8**

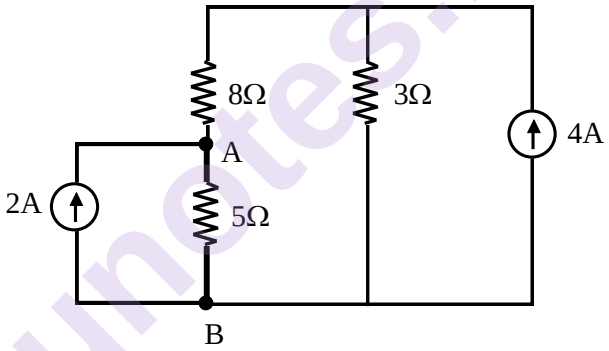
i) Draw oriented graph.
ii) Show 3 possible trees
iii) Write Tie set Matrix.
iv) Write Cut set Matrix.



3. a) Write steps required for finding Norton's equivalent circuit. **6**

b) State maximum power transfer theorem. **2**

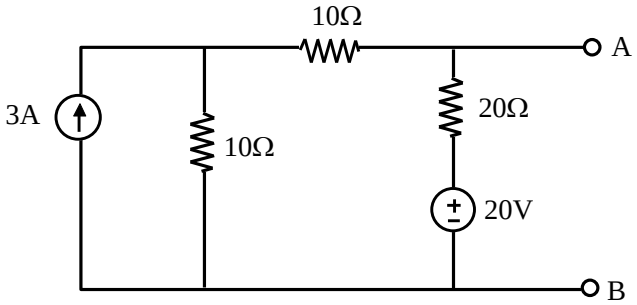
c) Find voltage across 5Ω resistor between A and B using SPT. **8**



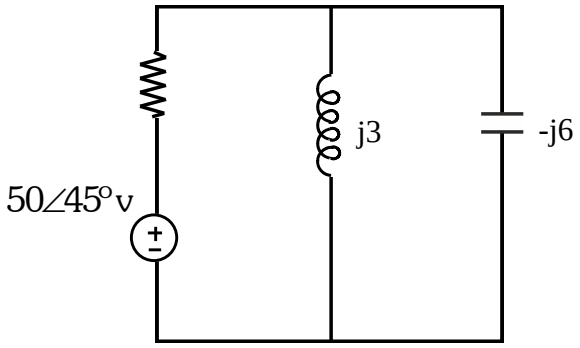
OR

4. a) What do you mean by dual network ? What conditions these 2 network must satisfy ? Explain with suitable example. **8**

b) Find Thevenin's equivalent circuit for the following. **8**



5. a) Find the change in current across 5Ω resistor, if 5Ω is changed to 10Ω, using compensation theorem. **8**



b) Explain : - **8**

i) Power factor
ii) Average power
iii) Power triangle
iv) Apparent power

OR

6. a) State and prove superposition theorem. **8**

b) A total current of 10A flows through the parallel combination of 3 impedance (2-j5) Ω, (6+j3) Ω and (3+j4) Ω. Calculate the current flowing through each branch. Find also the p.f. of combination. **8**

7. a) Explain transient dc response of R-L-C circuit. **8**

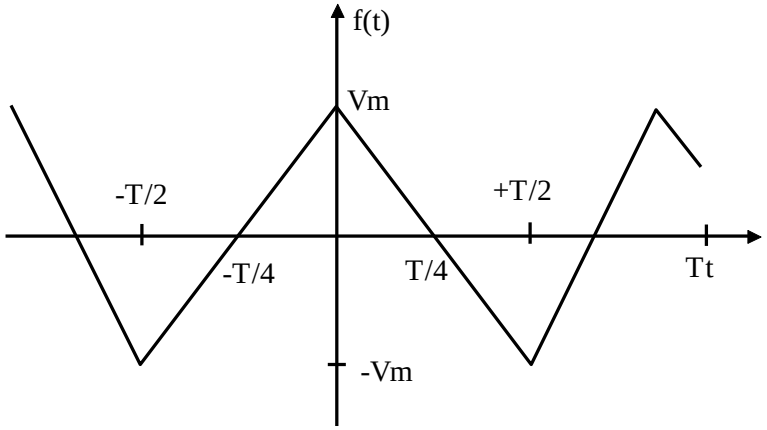
b) Explain steady state responses using classical technique. **8**

OR

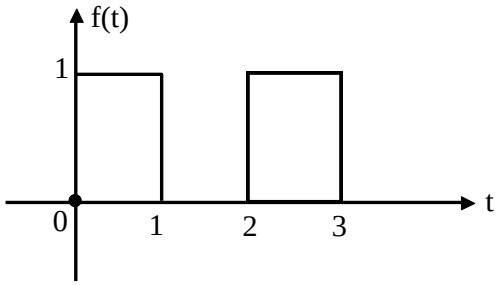
8. a) Explain transient dc response of R-C circuit. **8**

b) Explain sinusoidal response of a R-L Circuit. **8**

9. Determine the Fourier series of the triangular waveform shown. **16**



10. a) Obtain Fourier series for the square wave pulse train indicated below. **8**



b) Write frequency spectrum in detail. **8**

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