

Code No: R22029

R10
SET - 1
II B. Tech II Semester Supplementary Examinations, April/May-2017
ELECTRICAL CIRCUIT ANALYSIS - II

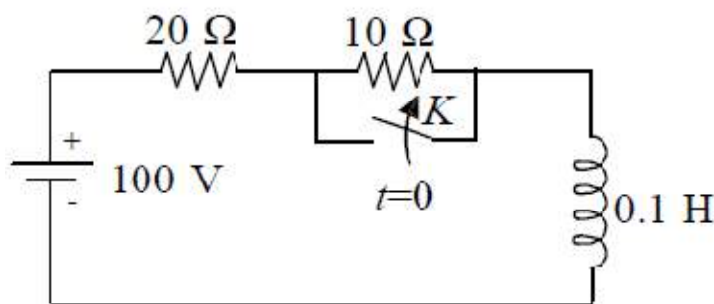
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
 All Questions carry **Equal** Marks
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1. a) A star connected load and  $\Delta$  connected load are connected in parallel to a symmetrical 3  $\phi$  AC supply. The phase current in each load is 15A. The P.F of the star connected load is unity and that of  $\Delta$  connected load is 0.5 pf lag. Find. (8M)
  - (i) the line current drawn from the supply.
  - (ii) overall power factor.
- b) Derive the relationship between phase quantities and line quantities in a 3 phase balanced (i) star connected system and (ii) Delta connected system. Draw phasor diagrams. Showing voltages and currents. (7M)
2. a) A 3 phase, 3 wire balanced supply is connected to an unbalanced 3 wire star connected load. Derive an expression for the neutral displacement voltage between supply and load neutral points. (8M)
- b) A 3 wire, 400V, ABC system supplies a star connected load with  $Z_A = 10 \angle 0^\circ \Omega$ ,  $Z_B = 5 \angle -30^\circ \Omega$ ,  $Z_C = 8 \angle 30^\circ \Omega$ . Find the line currents and the readings of the two wattmeters which are connected to measure the total power with current coils in lines A and B. (7M)
3. a) Derive the expression for transient response in series R-L-C circuit for DC excitation. Obtain the solution using Laplace transforms. (7M)
- b) A dc voltage of 100V is applied in the circuit shown in figure and the switch is kept open. The switch K is closed at  $t = 0$ . Find the complete expression for the current. (8M)



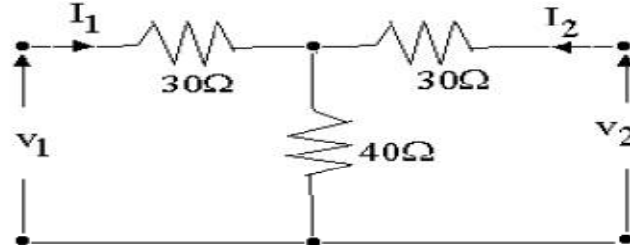
4. a) Derive the expression for  $V(t)$  of a parallel R - C circuit when excited by a sinusoidal current source. (8M)
- b) Find the current  $i(t)$  in a series R-L-C circuit with  $R=3\Omega$ ,  $L=1H$ ,  $C = \frac{1}{2}F$  when it is driven by an impulse voltage of  $\delta(t-2)$ . (7M)

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5. a) For the symmetrical 2-port network shown in Figure below find the ABCD- parameters. (8M)



- b) Determine the ABCD parameters of the network shown in fig. 6 (7M)

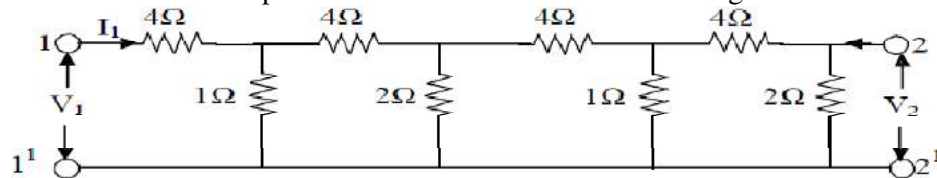
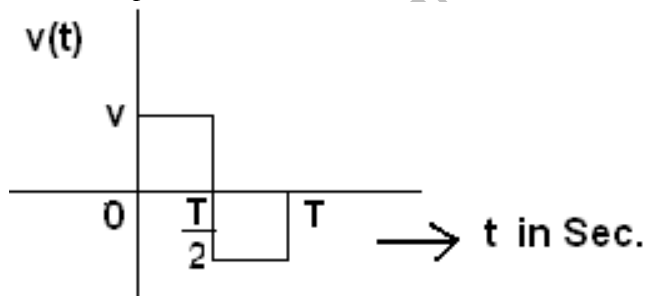


Fig.6

6. a) What are the properties of positive real function (8M)  
b) Realize the driving point impedance as Foster's first and second forms from  $Z(s) = \frac{(s^2 + 1)(s^2 + 4)}{s(s^2 + 2)}$  (7M)
7. a) Find the exponential form of Fourier series for the following waveform shown in figure. (8M)



- b) Prove that the odd function symmetry in Fourier series. (7M)
8. a) Derive the expression for Fourier transform of unit step function. (8M)  
b) Find the Fourier transform of rectangular function with unity amplitude and unity width. (7M)