Reg. No.									

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent Institution of MAHE, Manipal)

III SEMESTER B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING)

MAKEUP EXAMINATIONS, DECEMBER 2017

SUBJECT: ELECTRICAL CIRCUIT ANALYSIS [ELE 2101]

REVISED CREDIT SYSTEM

Time: 3 Hours **Date: 20 December 2017** **Max. Marks: 50**

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A. In the circuit shown in Fig Q1A, find voltage across 30 Ω resistor using Superposition Theorem. ***05***

1B. In the network shown in Fig Q1B, find the value of maximum power delivered to the load, if the load consists of variable resistance and reactance. ***05***

2A. In the circuit shown in Fig Q2A, R is varied from 0 to ∞. Draw the locus of current 'I' and hence determine

i) Minimum current
ii) Maximum current
iii) Current at resonance
iv) Value of R at resonance ***06***

2B. In the network shown in Fig Q2B, switch is closed at t = 0. Find v_1 and dv_1/dt at $t = 0^+$. ***04***

3A. Decompose the signal shown in Fig Q3A into its even and odd component signals. ***03***

3B. In the network shown in Fig Q3B, switch has been closed for a long time. If it is opened at t = 0, draw the transformed network for loop current analysis and hence find i(t). ***04***

3C. Draw the pole-zero diagram of the function

$$V(s) = \frac{(s^2 + 4)}{s^3 + 3s^2 + 2s}$$

Hence, obtain v(t) from the pole-zero diagram. ***03***

4A. In the network shown in Fig Q4A, switch is closed at t = 0. Find expression for the voltage across capacitor for t >0 using time domain analysis. ***05***

4B. In the network shown in Fig Q4B, switch is moved from position 1 to position 2 at t = 0. Switch was in position 1 for long time. Determine i(t) for t > 0 using time domain analysis. ***05***

5A. Find the Y-parameters of the network shown in Fig Q5A. ***05***

5B. Decompose the network shown in Fig Q5B into 2 two-port networks in series and hence find overall Z-parameters. ***05***

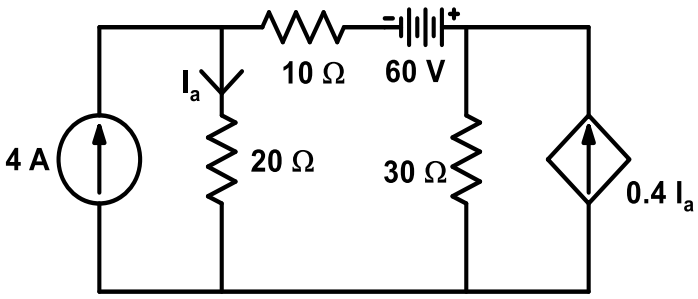

Fig Q1A

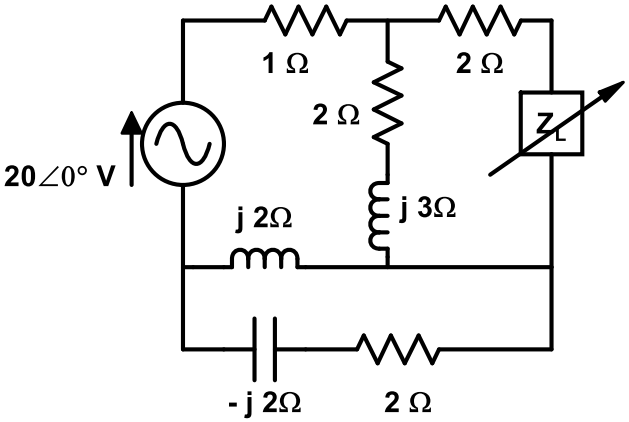

Fig Q1B

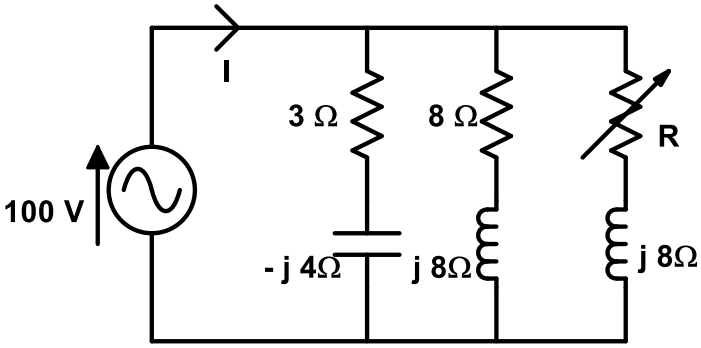

Fig Q2A

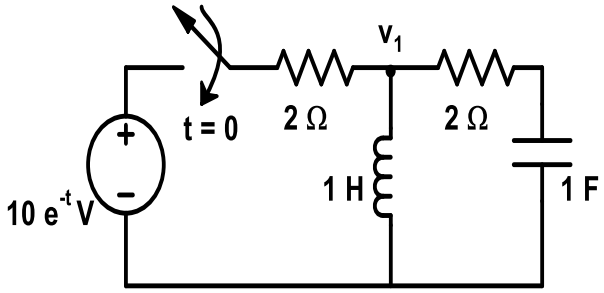

Fig Q2B

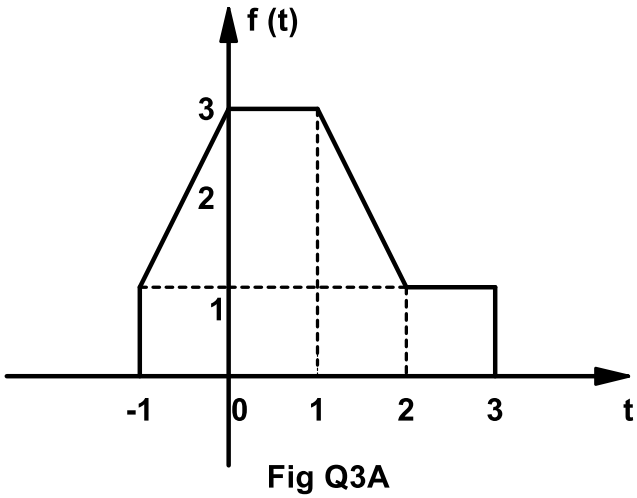

Fig Q3A

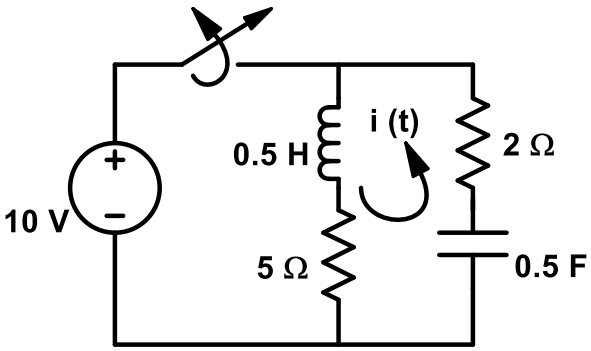

Fig Q3B

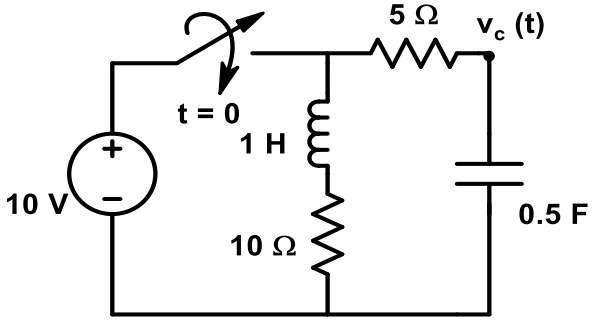

Fig Q4A

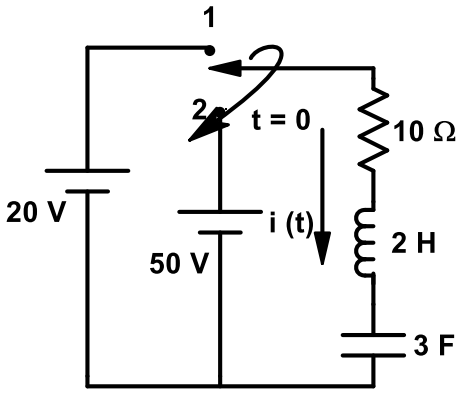

Fig Q4B

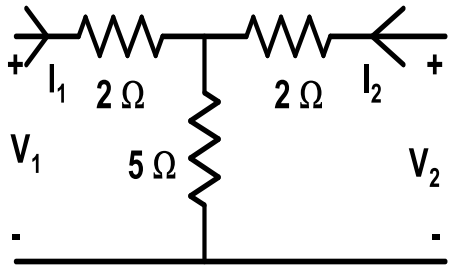

Fig Q5A

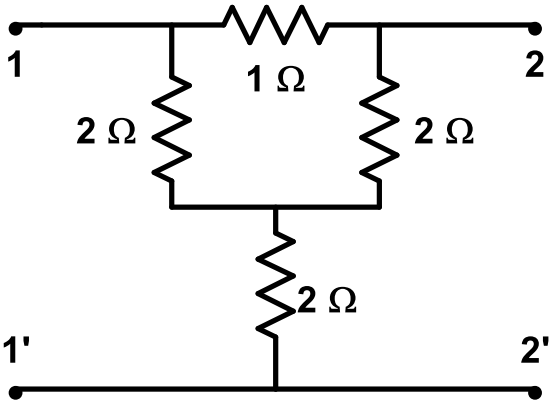

Fig Q5B