

Enrollment no:

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LDRP INSTITUTE OF TECHNOLOGY AND RESEARCH GANDHINAGAR
DEPARTMENT OF ELECTRONICS AND COMMUNICATION
B.E. 3RD SEMESTER
MID SEMESTER EXAMINATION AUGUST-2014

Subject Code: EC-302

Subject Name: Circuit Theory

Date: 25/08/2014

Branch: EC

Total Marks: 30

Time: 12.00 PM to 1.30 PM

Instructions:-All questions are compulsory.

-Figures to the right indicate full marks.

-Make suitable assumption, wherever necessary.

Que. 1 Do as Directed.

A) Define Following

1. Mesh
2. Branch
3. Network Synthesis

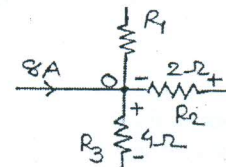
B) True or False

1. Every Mesh is a loop but every Loop is not a Mesh.
2. Every Network is a Circuit but every Circuit is not a Network.

C) In the network shown in fig. the voltage drop across R_2 and R_3 are 10 V & 16 V with polarities as shown.

The current in R_1 will be

- a) 9 A towards node 0
- b) 9 A away from node 0
- c) 9 A but direction cannot be found
- d) impossible to found



(6)

(3)

(2)

(1)

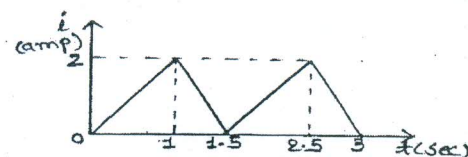
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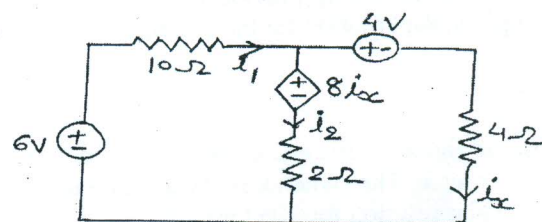
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Que. 2 Answer Following Questions.

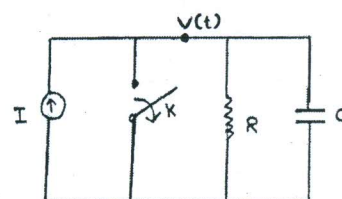
A) A single pure inductor of 2H passes a current of the waveform shown in fig. Calculate the voltage across inductor and the charge in the inductor at time $t=1$ & $t=1.5$ sec.



B) Use mesh analysis to determine branch currents I_1 , I_2 , I_x in the given network.

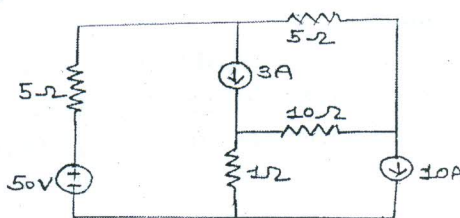


C) In the given network, the switch k is opened at $t=0$. Find v at $t=0^+$. If $I=10A$, $R=1000\Omega$, $C=1\mu F$.



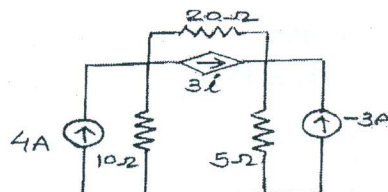
OR

- A) Determine the loop currents for the given network.



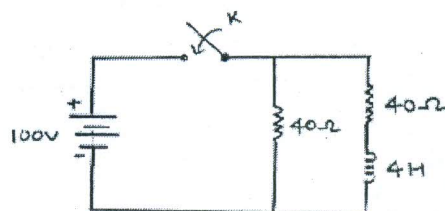
(5)

- B) Find V_1 & V_2 for given network using nodal analysis.



(5)

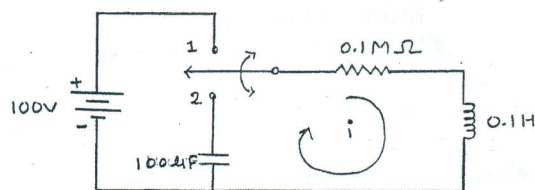
- C) In figure steady state condition is reached with 100V DC source. At $t = 0$, switch k is suddenly opened. Find the current through the inductor at $t = 0^+$.



(2)

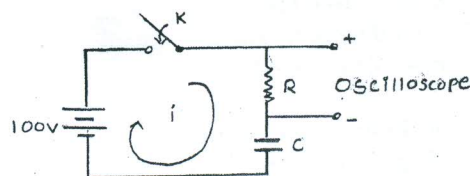
Que. 3 Answer Following Questions.

- A) In the given network, the switch k is moved from position 1 to 2 at $t=0$, a steady state having previously been attained. Determine $d^2i/dt^2(0^+)$ at $t = 0^+$.



(6)

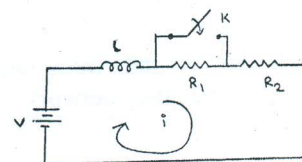
- B) In the network of figure switch k is closed at $t = 0$. The current waveform is observed with an oscilloscope. The initial value of the current is measured to be 0.1 A. The transient appears to disappear in 0.1 sec. find (i) value of R (ii) value of C and (iii) equation of the current



(6)

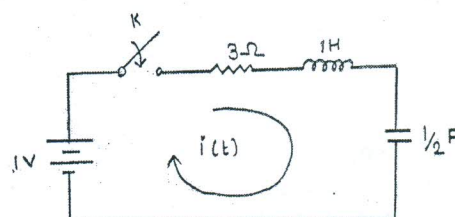
OR

- A) In the network of figure the switch k is closed at $t=0$, a steady state having previously been attained. Find the particular solution for the current.



(6)

- B) As shown in figure a series RLC circuit excited by a dc voltage source. The switch k is closed at $t = 0$. Find particular solution for $i(t)$ for $t \geq 0$.



(6)