Reg. No.

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

THIRD SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.)

END SEMESTER EXAMINATIONS, DEC 2016/JAN 2017

SUBJECT: ELECTRICAL CIRCUIT ANALYSIS [ICE 2101]

Time: 3 Hours   MAX. MARKS: 50

Instructions to Candidates:

❖ Answer **ALL** the questions.

❖ Missing data may be suitably assumed.

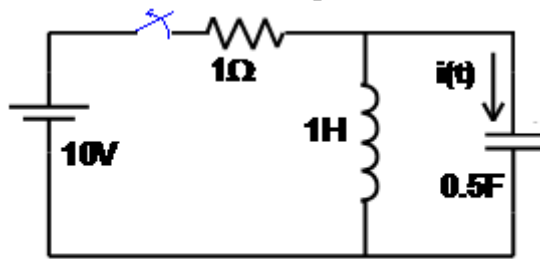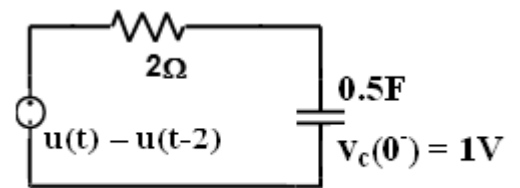|		
1A.	For the circuit shown in Fig.Q1A, determine the mesh currents.	**5**
1B.	Calculate the node voltages V_1 and V_2 for the circuit shown in Fig.Q1B	**3**
1C.	For the circuit shown in Fig.Q1C calculate the current in 3kΩ resistor	**2**
2A.	Use Thevinin's theorem to find the current in 10Ω resistor in the circuit shown in Fig.Q2A.	**5**
2B.	State and prove maximum power transfer theorem for the resistive load.	**3**
2C.	For the network shown in Fig.Q2C, determine the current through 10Ω resistor using superposition theorem	**2**
3A.	In the network of the Fig.Q3A the switch k is opened at t=0 after the network has attained steady state with the switch closed. Determine $V_K(0+)$, and $\dfrac{dV_k}{dt}(0^+)$	**5**
3B.	A resistance of 10Ω, capacitor of 10μF and Inductance of 10mH is connected in series with ac source of 100V. Determine the resonating frequency, quality factor and bandwidth of the circuit. Also determine maximum power dissipated in the circuit.	**3**
3C.	In the circuit shown in Fig.Q3C, find current for t≥0.	**2**
4A.	In the network of the Fig.Q4A the switch k is opened at t=0 after the network has attained steady state with the switch closed. Obtain expression for current i(t) in complementary and particular solution form.	**5**
4B.	Obtain expression for current in the circuit shown in Fig.Q4B.	**3**
4C.	Plot x(t)= r(t) − 2r(t-1) + 2r(t-3) + r(t-4)	**2**
5A.	Use Laplace transform to find current i(t) in the circuit shown in Fig.Q5A	**4**
5B.	For the network shown in Fig.Q5B find Y parameters.	**4**
5C.	Obtain the relationship between Y and Z parameters	**2**
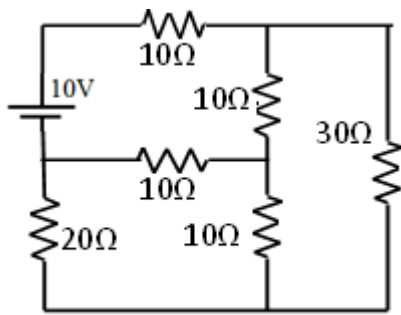
Fig. Q1A
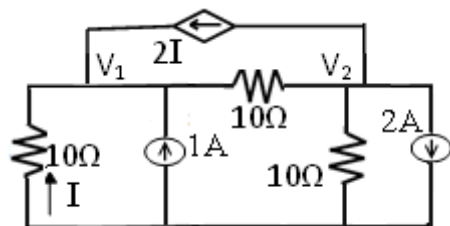
Fig. Q1B
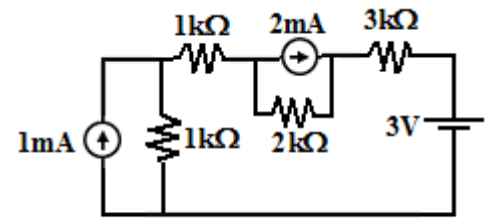
Fig. Q1C
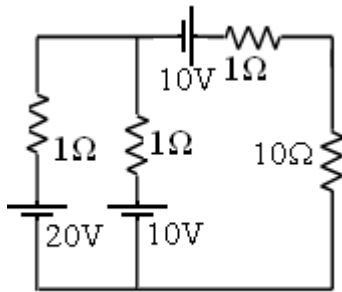
Fig. Q2A
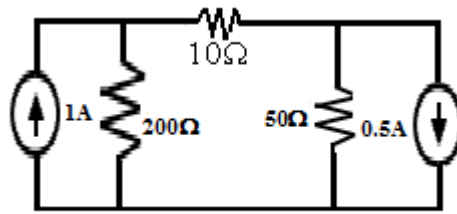
Fig. Q2C
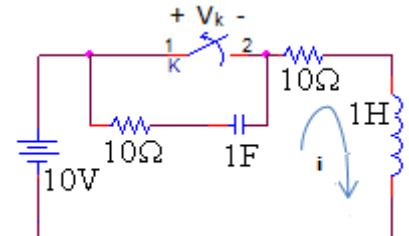
Fig. Q3A
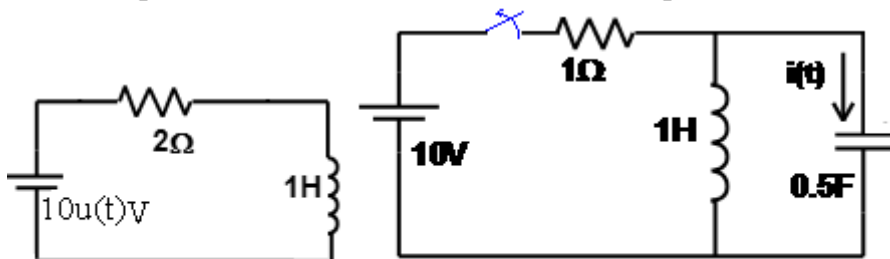
Fig. Q3C

Fig. Q4A

Fig. Q4B

Fig. Q5A

Fig. Q5B

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