Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
A Constituent Institution of Manipal University

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

END SEMESTER EXAMINATIONS, NOV/DEC 2016

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.	determine the node voltages for the circuit shown in Fig.Q1B	**3**
1C.	For the circuit shown in Fig.Q1B, find the current in 10Ω resistor using superposition theorem.	**2**
2A.	Obtain Norton's equivalent for the circuit shown in Fig.Q2A, with respect to R_L.	**5**
2B.	In the circuit shown in Fig.Q2B, find current I and verify reciprocity theorem.	**3**
2C.	Obtain Thevinin's equivalent for the circuit shown in Fig.Q2C,with respect to R_L	**2**
3A.	In the network shown Fig. Q3A, the switch is closed at t=0, a steady state having previously been attained. Determine $v_a(0^-)$ and $v_a(0^+)$.	**5**
3B.	A source of 100V with source impedance 5+j3 and frequency 1000 Hz is connected to a load of capacitor C in series with 10Ω resistor. At what value of C, power in the 10Ω resistor is maximum? What is the power?	**3**
3C.	For the circuit shown in Fig.Q3C, find current in the circuit at 5 seconds.	**2**
4A.	For the circuit shown in Fig. Q4A, obtain expression for current in complementary and particular solution form.	**5**
4B.	Obtain expression for current in the circuit shown in Fig.Q4B.	**3**
4C.	Express the waveform shown in Fig. Q4C using basic signals and write the Laplace transform.	**2**
5A.	Use Laplace transform to find i1 and i2 in the circuit shown in Fig.Q5A	**4**
5B.	For the network shown in Fig.Q5B find Y parameters. Hence find Z parameters	**4**
5C.	Find h parameters for the circuit shown in Fig.Q5C	**2**

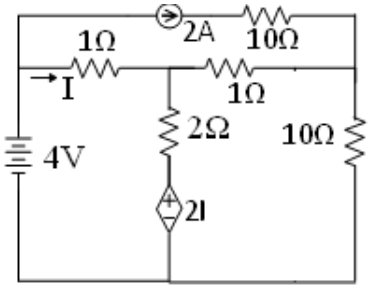

Fig. Q1A

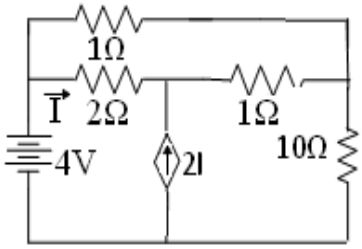

Fig.Q1B

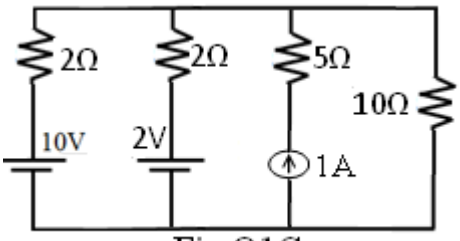

Fig.Q1C

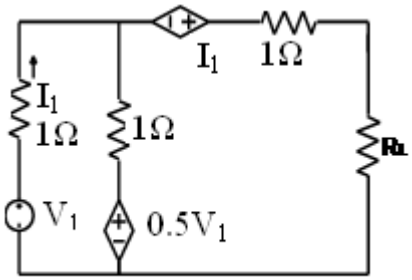

Fig. Q2A

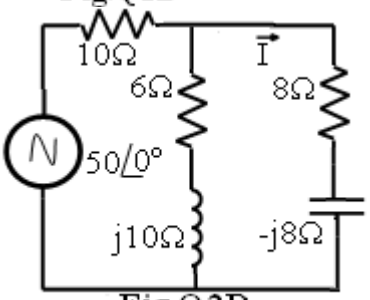

Fig.Q2B

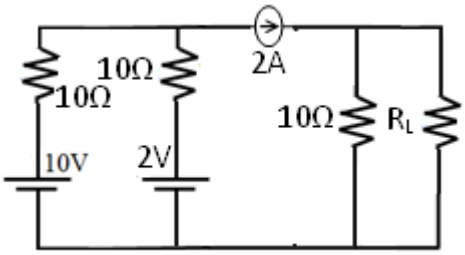

Fig.Q2C

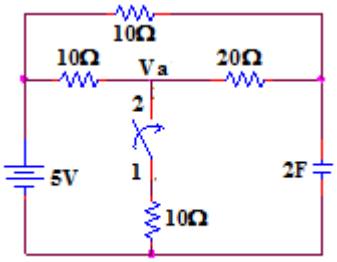

Fig. Q3A

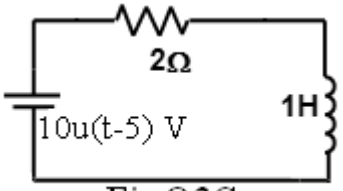

Fig.Q3C

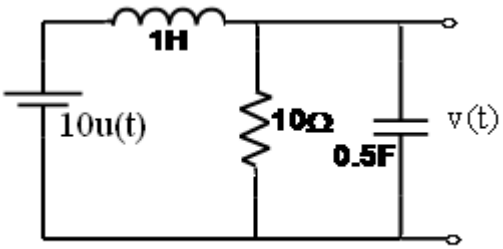

Fig. Q4A

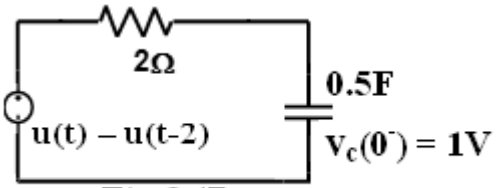

Fig.Q4B

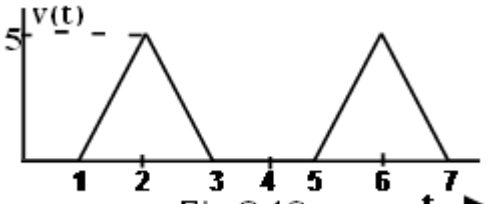

Fig.Q4C

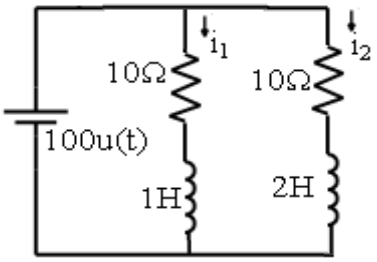

Fig. Q5A

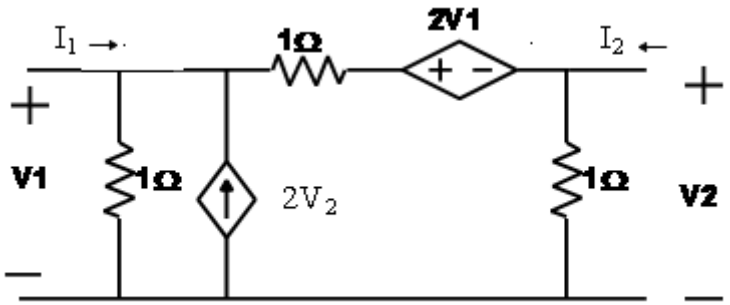

Fig.Q5B

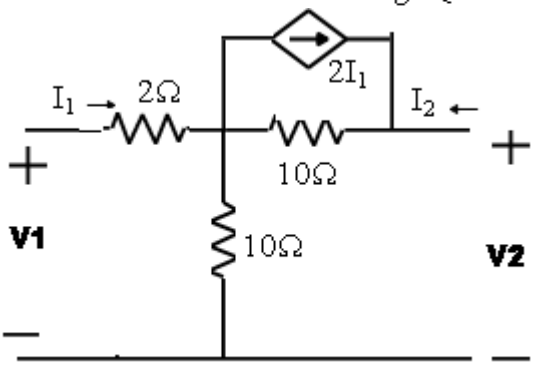

Fig. Q5C

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