

Code: EE3T4

**II B.Tech - I Semester – Regular/Supplementary Examinations
November 2019**

**ELECTRICAL CIRCUIT ANALYSIS - II
(ELECTRICAL & ELECTRONICS ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

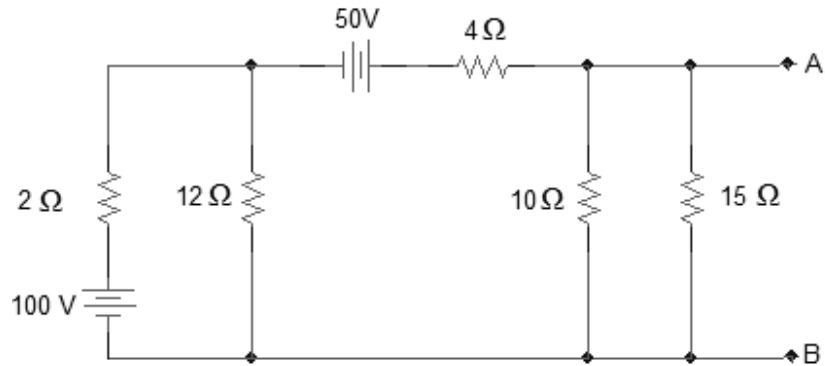
1.

- a) State Millman's theorem.
- b) State Maximum power transfer theorem for complex impedance circuits.
- c) State Reciprocity Theorem.
- d) Write the conditions for reciprocity and symmetry in admittance parameter representation of a two port network.
- e) Express A and D in terms of impedance parameters.
- f) State superposition property of Laplace transform.
- g) State initial value theorem of Laplace transforms.
- h) What are Dirichlet conditions?
- i) What is the voltage across the capacitor C at $t = 0^+$, when a series RC circuit is connected to a voltage V at $t = 0$. (Assume the capacitor is initially discharged).
- j) Draw the steady state DC response of current in RC circuit.
- k) What is the condition for the transient current to be oscillatory in RLC circuit?

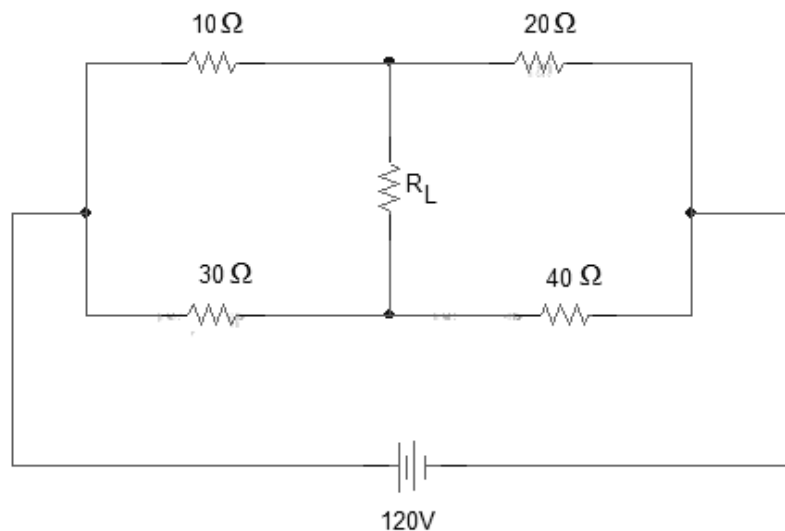
PART – B

Answer any **THREE** questions. All questions carry equal marks.
3 x 16 = 48 M

2. a) Obtain the Thevenin's equivalent at the terminals A & B for the circuit shown below. 8 M

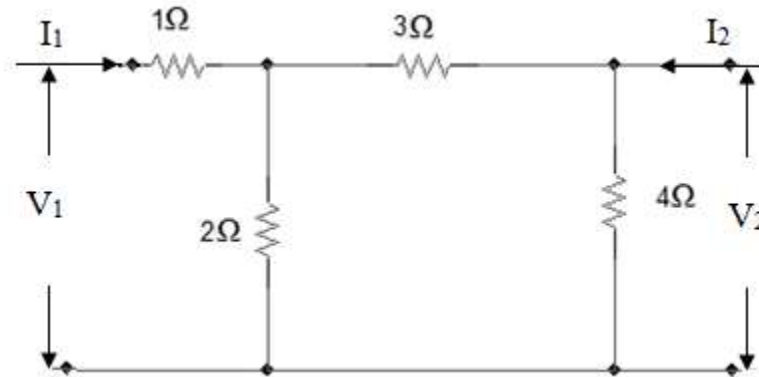


- b) Determine the load resistance to receive the maximum power from the source. Also find the maximum power delivered to the load. 8 M



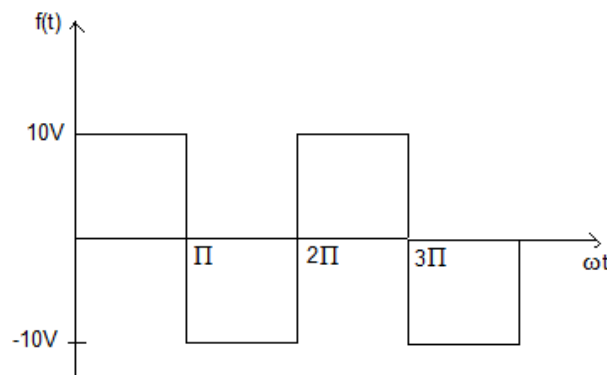
3. a) The impedance parameters of a two port network are $Z_{11} = 4\Omega$, $Z_{22} = 8\Omega$, $Z_{12} = Z_{21} = 6\Omega$. Compute the ABCD parameters and admittance parameters. 8 M

b) Find the h parameters for the circuit shown below. 8 M



4. a) State and prove the Convolution theorem. 8 M

b) Determine the Fourier series for the periodic square wave shown below. 8 M



5. a) A resistor $R = 10\Omega$, inductor $L = 0.5\text{H}$, capacitor $C = 10\mu\text{F}$ are connected in series with a switch and a DC voltage of 150V in the circuit. When the switch is closed at $t = 0$, find the current transient. 8 M

b) Using Laplace transform, determine the current response of a RC circuit for a step input. 8 M

6. a) A resistor $R = 10\Omega$, inductor $L = 0.05\text{H}$ and capacitor $C = 100\mu\text{F}$ are connected in series with a switch. A sinusoidal voltage of $100 \sin(314t + \phi)$ is applied to the circuit. When the switch is closed at $\phi = 30^\circ$, Derive the expression for current. 8 M

b) A resistor $R = 5\Omega$ and inductor $L = 2\text{H}$ are connected in series with a switch and supply voltage of $100 \sin(200t)$. Determine the transient current. 8 M