Roll No. **Total No. of Pages : 03**

Total No. of Questions : 18

B.Tech. (EE) (2018 Batch) (Sem.–3)

ELECTRICAL CIRCUIT ANALYSIS

Subject Code : BTEE-301-18

M.Code : 76381

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Answer briefly :

1. State Thevenin's theorem.
2. What do you mean by dependent sources? Explain.
3. Discuss the significance of phasor diagrams.
4. What do you mean by steady state response? Explain.
5. Differentiate between passband and stop band.
6. What do you mean by network functions? Explain.
7. What is the significance of two port networks? Explain.
8. List the advantages of m-derived filters.
9. What do you mean by poles and zeros? Explain.
10. What is the need of Laplace transform? Discuss.

SECTION-B

11. Calculate the current throught the resistors and through the voltage source of the circuit shown below by the principle of superposition.

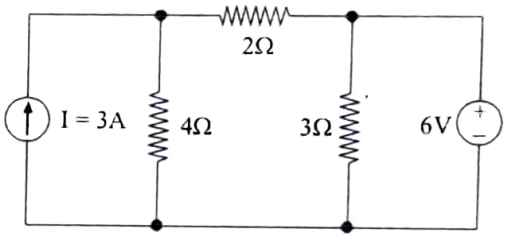

FIG.1

12. Design a constant-K low pass filter to be terminated in 600 ohm, having a cut-off frequency of 3kHz. Determine :

    a) The frequency at which the filter offers attenuation of 17.372 dB.

    b) Attenuation at 6kHz.

13. A series RLC circuit has R = 25 ohm, L = 0.04 H, C = 0.01μF. Calculate the resonant frequency. If a 1 V source of same frequency as a frequency of resonance is applied to this circuit, calculate the frequencies at which the voltage across L and C are maximum. Also calculate the voltages.

14. For the given polynomial $F(s) = s^6 + 5s^5 + 11s^4 + 25s^3 + 36s^2 + 30s + 36$. Determine the stability of the system using Routh-Hurwitz stability criterion.

15. Find the current i(t) in a series RL circuit shown in the figure using Laplace transform. The switch K is closed at t = 0.

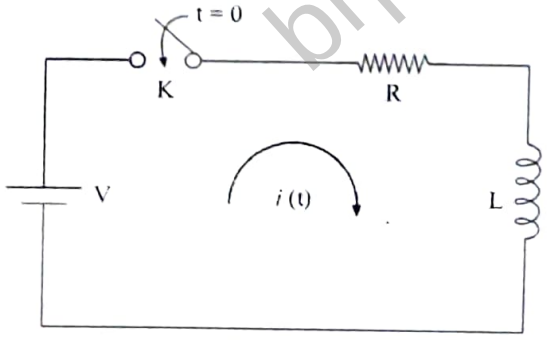

FIG.2

SECTION-C

16. Synthesize first & second the Foster and Cauer forms of the LC driving point impedance function $\frac{(s^2+1)(s^2+16)}{s(s^2+4)}$.

17. For the network shown in figure drive the open circuit impedance and short circuit admittance parameters also draw their equivalent circuits.

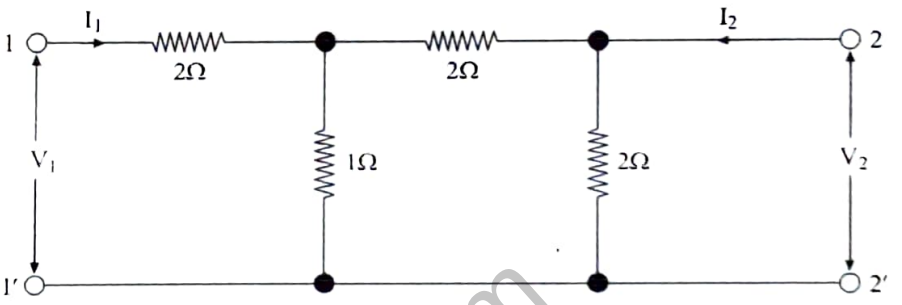

FIG.3

18. Discuss the following :

a) Reciprocity theorem

b) Norton's theorem

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.