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

Total No. of Questions : 18

B.Tech. (Electrical & Electronics/Electronics & Electrical)
(2018 Batch) (Sem.–3)

ELECTRICAL CIRCUIT ANALYSIS

Subject Code : BTEEE-301-18
M.Code : 76463

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

Write briefly :

1. State reciprocity theorem.
2. What do you mean by steady state response? Explain.
3. Explain the importance of phasor diagrams.
4. List the advantages of Laplace transform.
5. Differentiate between passband and band reject filters.
6. What do you mean by an ideal transformer? What is the need of a transformer? Discuss.
7. What do you mean by natural response of the network? Explain.
8. Compare constant k and m-derived filters.
9. What is the effect of poles and zeros in a system? Explain.
10. Why two port networks are required? Explain.

SECTION-B

11. Obtain the Thevenin equivalent for the bridge circuit of the figure shown below at terminal xy.

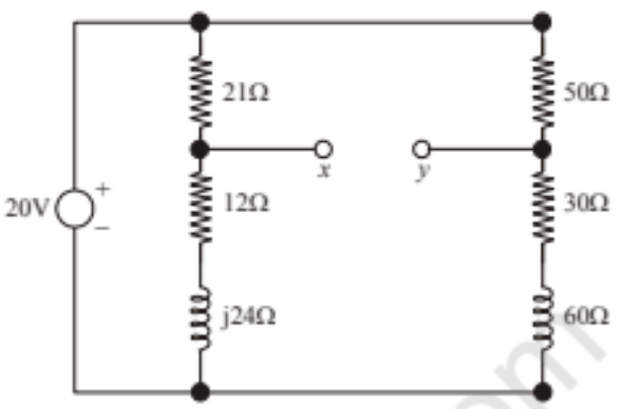


FIG.1

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

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

    ii) Attenuation at 6kHz

    iii) The characteristic impedance and phase constant at 2 kHZ.

13. Two identical sections of the network shown in figure are connected in series. Obtain the Z parameters of the combination and verify the result by direct calculation.

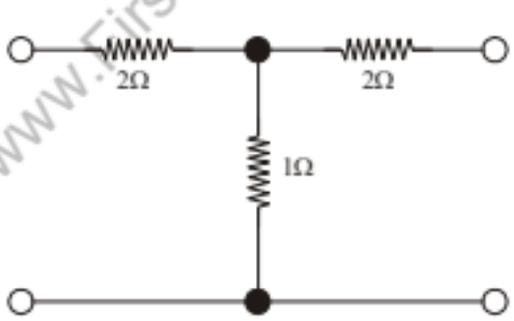
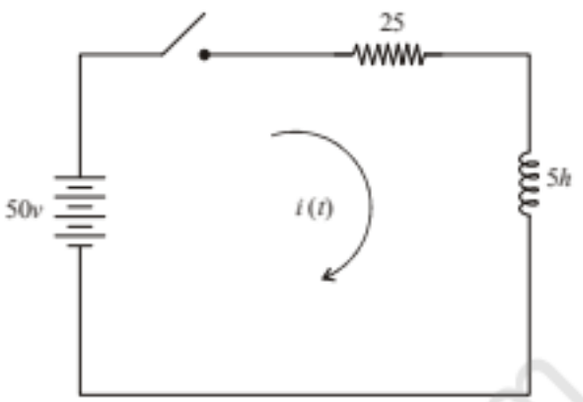


FIG.2

14. For the given polynomial $F(s) = s^4 + 3s^3 + 3s^2 + 2s + K$, Determine the range of parameter K for the system to be stable using Routh-Hurwitz stability criterion.

15. For the circuit shown in figure, determine the voltage and the current in the circuit and obtain an expression for the power delivered by the source.

Assume the switch is closed at time t=0 and the circuit is under steady state.



For $t < 0$

FIG.3

SECTION-C

16. Determine the Foster and Cauer form of realization of the given driving- point impedance function $Z(s) = \dfrac{4(s^2+1)(s^2+9)}{s(s^2+4)}$.

17. For the circuit given in figure, calculate the current following through the load connected across AB using Nodal analysis. Verify your result using mesh analysis.

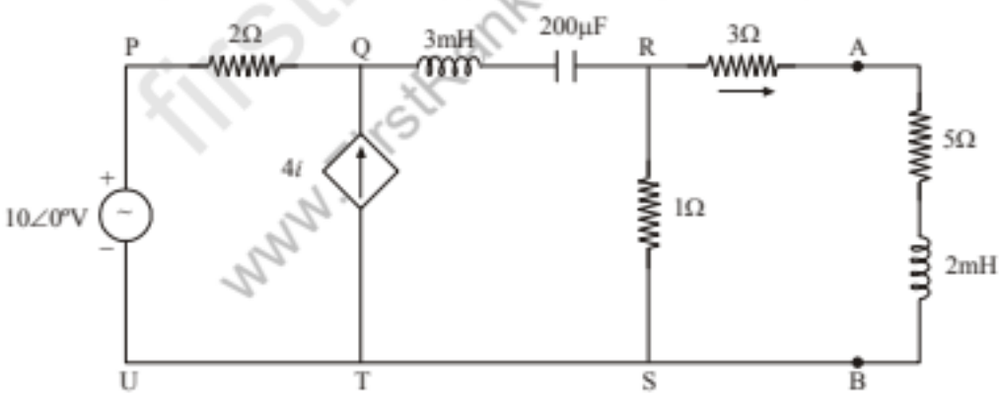


FIG.4

18. Discuss the following :

i) Parallel Resonance

ii) Filters and their classification

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.