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

Total No. of Questions : 18

B.Tech. (ECE) (2018 Batch) (Sem.–3)

NETWORK THEORY

Subject Code : BTEC-304-18

M.Code : 76447

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 and its applications.

2. Find convolution of $f_1(t)=2u(t)$ and $f_2(t)=e^{-3t}\,u(t)$,where $u(t)$ is a step function.

3. Define hybrid parameters with equations and application,

4. A series RL circuit has R=1K Ω, L=10mH and C=2 μF. Find the Transfer function of the circuit.

5. Define the necessary and sufficient conditions for a polynomial to be Hurwitz.

6. Z parameters are $Z_{11} = 10\Omega$, $Z_{22} = 20\Omega$, $Z_{12} = Z_{21} = 5\Omega$. Find equivalent T network.

7. Obtain the image impedance for a T-network for which the resistance of three arms are equal to 3Ω.

8. Give the difference in properties of RC, RL and LC circuit.

9. State the advantages of 3-phase supply over single phase.

10. For a series RC circuit excited by 10V ac voltage, with a time constant τ sec. Find the voltage across C at time t.

SECTION-B

11. For the given two port network calculate the hybrid parameters of Fig. 1.

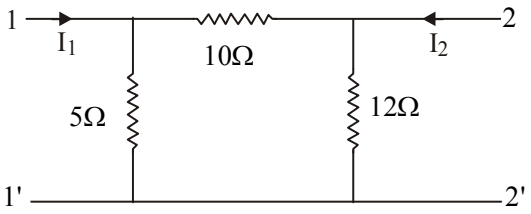

FIG.1

12. Find whether the given function is a positive real function?

$$F(s) = \frac{2s^2 + 5s + 1}{s^3 + 2s^2 + s + 2}$$

13. Find the Fourier transform of the pulse as shown in Fig. 2

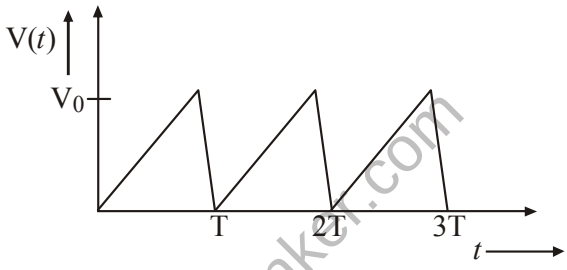

FIG.2

14. In the circuit shown, steady state is reached with switch open. Switch is closed at t=0. Determine i(t) for t > 0. (Fig. 3)

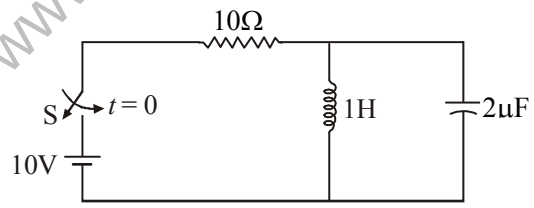

FIG.3

15. A delta connected three phase load has 10 < 0°, 5 < –90° and 2 < 90°. The supply voltage is 400V, 50Hz. Calculate the line currents for RBY phase sequence.

SECTION-C

16. The driving point impedance is given by :

$$Z(s)=\frac{s\left(s^2+9\right)}{\left(s^2+5\right)\left(s^2+13\right)}$$

Obtain the Foster-I and Foster-II forms.

17. What do you mean by balanced and unbalanced loads? Explain Millman's theorem for unbalanced loads with diagram and equations.

18. Obtain the trigonometric form of Fourier series expansion of the rectified sine wave of Fig.4.

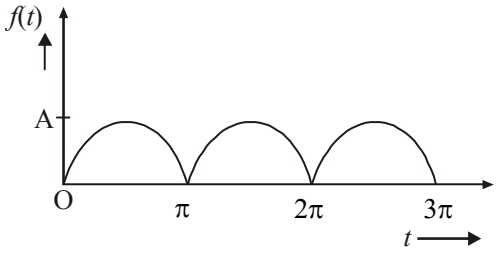

FIG.4

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.