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

Total No. of Questions : 09

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

1. Write briefly :

a) Define maximum power transfer theorem and state the conditions for maximum power transfer for dc and ac circuits.

b) State convolution theorem.

c) Define Transmission Parameters.

d) A series RL circuit has R=10KΩ, L=10mH and C=1 μ F. Find the Transfer function of the circuit.

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

f) Define: transfer function, pole, zero.

g) Define : image impedance and Quality Factor.

h) Give the properties of LC circuit.

i) State the advantages of 3-phase supply over single phase.

j) Find the Laplace Transform of

i) $e^{-5t}\cos 2t$

ii) te^{-2t}

SECTION-B

2. For the given two port network calculate the Impedance parameters.

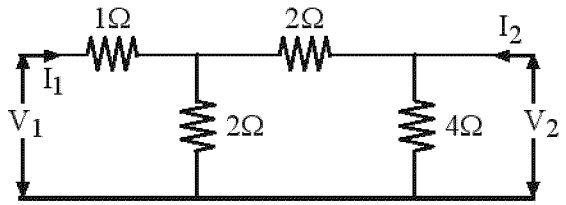

FIG.1

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

$$F(s) = \frac{s^2 + 50s + 14}{s + 12}$$

4. Determine the exponential form of Fourier series expansion for periodic wave shown in Fig.2.

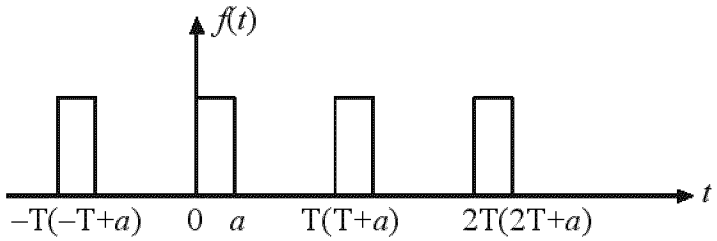

FIG.2

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

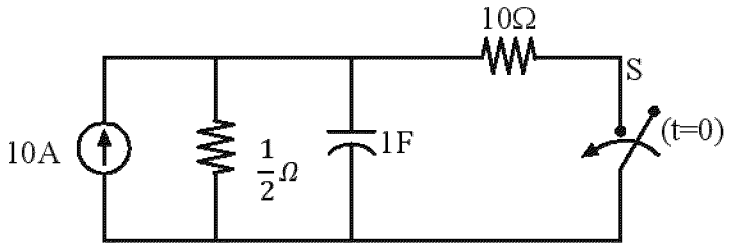

FIG.3

6. What are different types of filter? Explain Butterworth Filter.

SECTION-C

7. The driving point impedance is given by :

$$z(s) = \frac{(s+1)+(s+4)}{(s)(s+2)}$$

Obtain the Foster-I and Foster-II forms.

8. An unbalanced three-wire, star connected load has a voltage of 400V, the loads are : (4+j8),(3+j4) and (15+j20)Ω. Determine line currents and voltage across each phase impedance.

9. Find current I in the 5Ω resistor using Thevenin theorem and verify the result using Norton theorem Fig. 4.

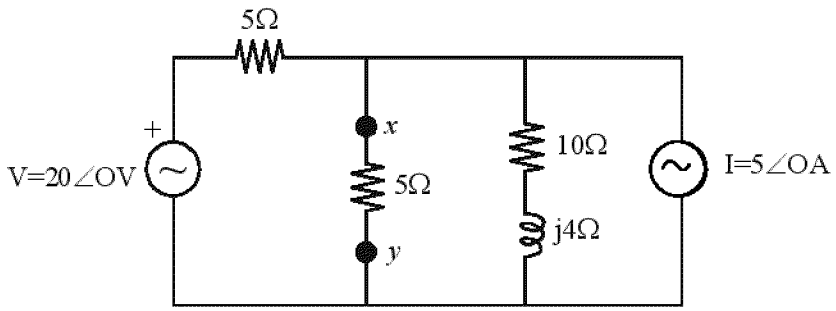

FIG.4

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.