(Pages : 4) **3031**

Reg. No. : .....

Name : .....

Third Semester B.Tech. Degree Examination, April 2015
(2013 Scheme)
13.303 : NETWORKS AND SYSTEMS (E)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions. **Each** question carries **2** marks.

1. Explain neutral displacement in 3ϕ , 3 wire systems.
2. Explain waveform symmetry in Fourier series analysis.
3. Write short notes on frequency spectrum of waveform.
4. Define tree. List its properties.
5. Derive the Laplace transform of te^{-at} from fundamentals.
6. Explain image impedance of 2 port network.
7. Explain the characteristics of filters.
8. Give the conditions for reciprocal network in terms of 2-parameters.
9. List the properties of L-C admittance function.
10. Explain static and dynamic systems. **(10×2=20 Marks)**

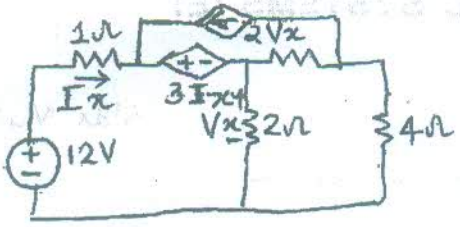
P.T.O.

PART – B

Answer **one** full question from each Module. Each question carries **20** marks.

Module – I

11. a) Determine the power delivered to 4 Ω resistor by mesh analysis. **8**

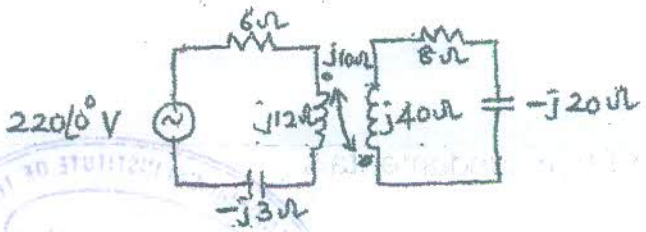


b) A balanced star connected load of impedance 15 + j 20 Ω per phase is connected to a three phase, 400 V, 50 Hz supply. Find the line currents and power absorbed by load. Assume RYB sequence. Draw the phasor diagram. **12**

OR

12. a) Explain the exponential from of Fourier series. **8**

b) Calculate the primary and secondary current in the coupled circuit. **12**



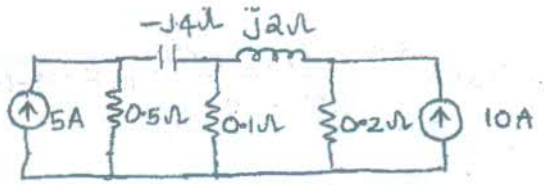
Module – II

13. a) If $H(S) = \frac{s(s+1)}{(s+4)(s^2+6s+18)}$, find h(t) using the pole-zero diagram of the function. **12**

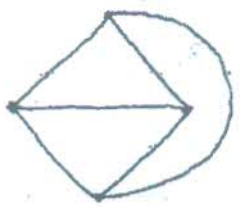
b) Derive the expression for total response of a series RL circuit excited by DC source. Assume initial energy is stored in the inductor. **8**

OR

14. a) For the given network, obtain incidence matrix. 12



b)



For the given graph, determine f-cutset matrix. 8

Module – III

15. a) Find h parameters in terms of

i) ABCD parameters

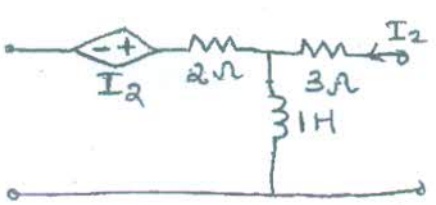
ii) Y parameters.

Also determine the condition for

iii) Reciprocal

iv) Symmetrical network in terms of h parameters. 12

b) Obtain the Z parameters of the given network. 8



OR

16. a) Design an m-derived low pass filter having design resistance R = 500 Ω, cut off frequency = 1500 Hz and infinite attenuation frequency 2000 Hz. 10

b) Find the component values of π-network constant k-high pass filter having cut off frequency of 8 KHz and nominal characteristic impedance of 600 Ω. Also find its characteristic impedance and phase constant at f = 12 KHz and attenuation at f = 0.8 KHz. 10

Module – IV

17. a) Synthesize the given network function $2(s) = \frac{8(s^2+4)(s^2+25)}{s(s^2+16)}$ in Foster-I and Foster-II forms. 14

b) Determine whether the following functions represent LC driving point impedance $Z_1(s) = \frac{s(s^2+4)(s^2+16)}{(s^2+9)(s^2+25)}$; $Z_2(s) = \frac{(s^2+1)(s^2+8)}{s(s^2+4)}$. 6

OR

18. a) Find whether the following systems are linear or non linear

i) $y(t) = 4\frac{dx(t)}{dt}$

ii) $y(t) = e^{x(t)}$ 10

b) Define LTI system and

i) Verify whether the given system is linear and time invariant $3\frac{dy(t)}{dt} + 6y(t) = x(t)$.

ii) Find whether the following systems are causal or non-causal

a) $y(t) = x(t) + x(t^{-1})$

b) $y(t) = x(t^3)$. 10
