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Reg. No. : .....

Name : .....

Third Semester B.Tech. Degree Examination, December 2015
(2008 Scheme)
08.303 : NETWORK ANALYSIS (TA)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions.

1. Obtain the transfer function of a network (impedance function) having poles at $-1 + j$ and $-1 - j$. Also obtain its impulse response.
2. Explain the frequency transformation to high pass and bend pass filters.
3. Write down the features of Butterworth and Chebysher functions.
4. State and explain superposition theorem.
5. Define image impedance and characteristic impedance.
6. Discuss about the restrictions of poles and zeros in driving point function.
7. What is Bode Plot ? How it is useful in analysing network functions ?
8. Explain resonance in parallel circuits.
9. The y-parameters of a two port network are y_{11}, y_{12}, y_{21} and y_{22}. Obtain a two controlled source model of the network.
10. Plot impulse, step and ramp functions. **(10×4=40 Marks)**

P.T.O.

PART – B

Answer **any two** questions from **each** Module. **Each** question carries **10** marks.

Module – I

11. a) Explain the voltage waveform shown in Fig. 1 in term of unit steps and unit ramps.

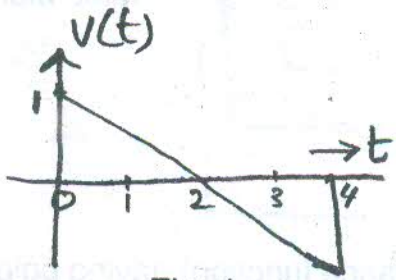

Fig. 1

b) Sketch the following functions

i) K r(t – 1)

ii) K r(t + 1).

12. For the circuit shown in Fig. 2, the switch is closed at t = 0 when the 6 μF capacitor has charge of 300 μ C . Obtain the expression for the transient voltage V_R.

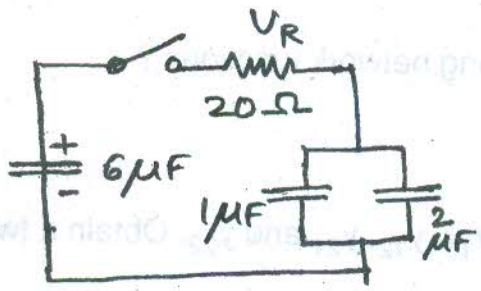

Fig. 2

13. In the RL circuit shown in Fig. 3 the switch is in position 1 long enough to establish steady state condition, and at t = 0 it is switched to position 2. Find the resulting current.

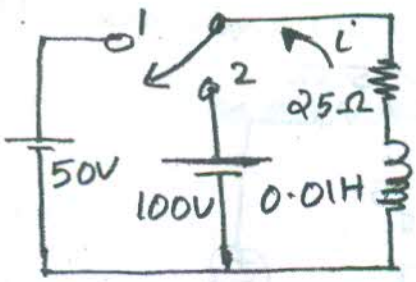

Fig. 3

Module – II

14. Determine Z-parameters of the network shown in Fig. 4.

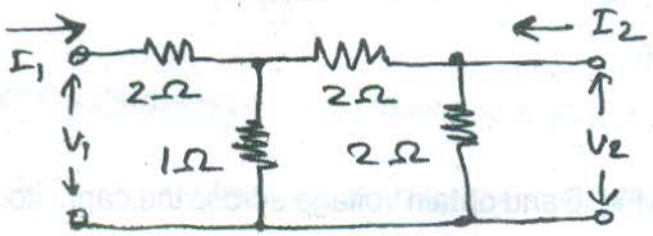

Fig. 4

15. Compute voltage transfer function for the network shown in Fig. 5.

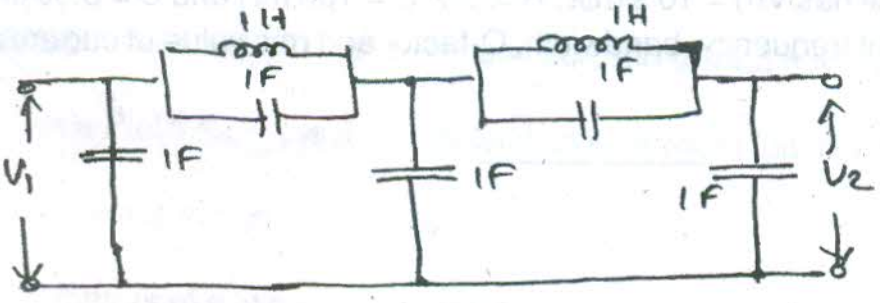

Fig. 5

16. a) Given $I(s) = \frac{20\,s}{(s+1)(s+2)}$. Plot the pole-zero diagram and hence obtain i(t).

b) Draw a T-type attenuator and obtain its characteristic impedance.

Module – III

17.

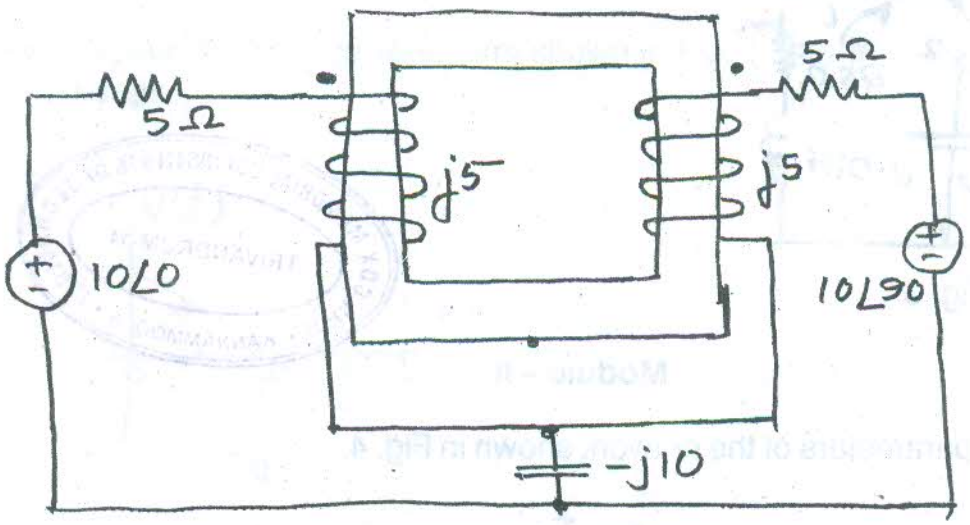

Fig. 6

Analyse the coupled circuit shown in Fig. 6 and obtain voltage across the capacitor.

18. A butterworth filter has –2 dB or better cut-off at 20 rad/sec and at least 10 dB attenuation at 30 rad/sec. Obtain its order and cut-off frequency.

19. A series RLC circuit has $V(t) = 10 \sin \omega t$, $R = 3\Omega$, $L = 100$ mH and $C = 3.09\,\mu F$. Determine resonant frequency, bandwidth, Q-factor and rms value of current at resonance.
