4E4172

Roll No. _

Total No of Pages: 7

4E4172

B.Tech. IV-Sem (Main & Back) Exam; June-July 2016

Electrical Engineering

4EE2A Circuit Analysis-II

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks (Main & Back): 26

Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

*Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1. NIL

2. NIL

UNIT-I

Q.1 (a) Explain the Concept of Complex frequency. [6]

(b) Obtain $\frac{V(s)}{I(s)}$ and $\frac{V_{ab}(s)}{V(s)}$ for the Network shown in fig.1 [10]

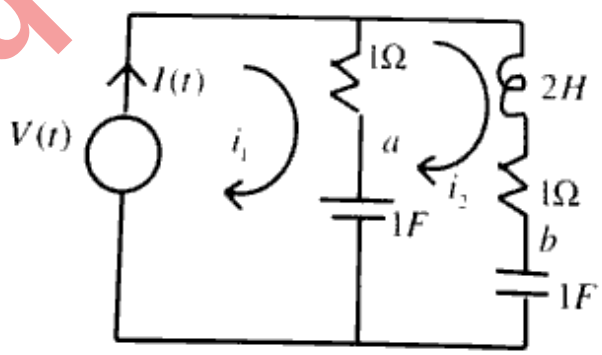

Fig.–1

OR

Q.1 (a) Determine the condition under which the input impedance of Network shown in fig.2 will be equal to R [8]

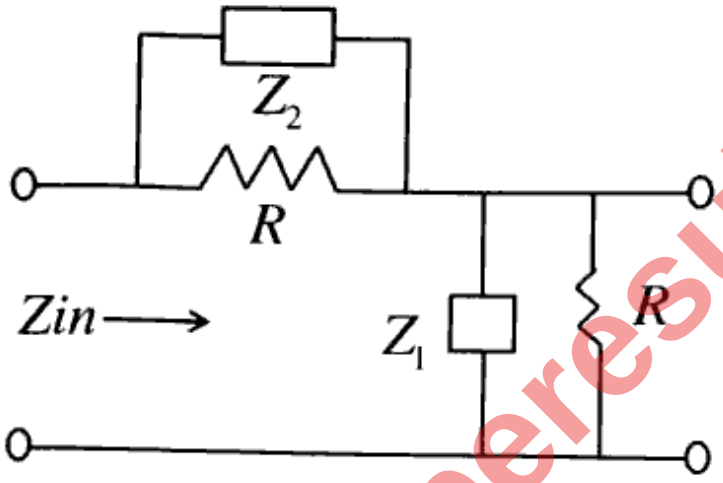

Fig.–2

(b) Find the Transform Impedance Z(s) and admittance Y(s) of the one port network shown in fig.3 [8]

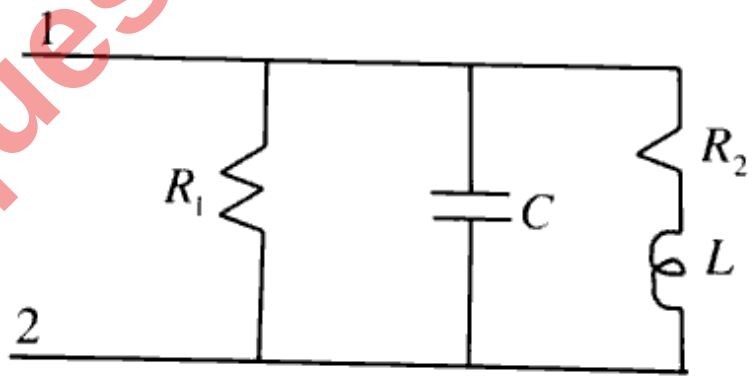

Fig.–3

UNIT-II

Q.2 (a) Write down necessary Condition for Transfer function and also find Transfer function $Z_{21}(s) = \frac{V_2(s)}{I_1(s)}$ of the Network given in fig.4 [8]

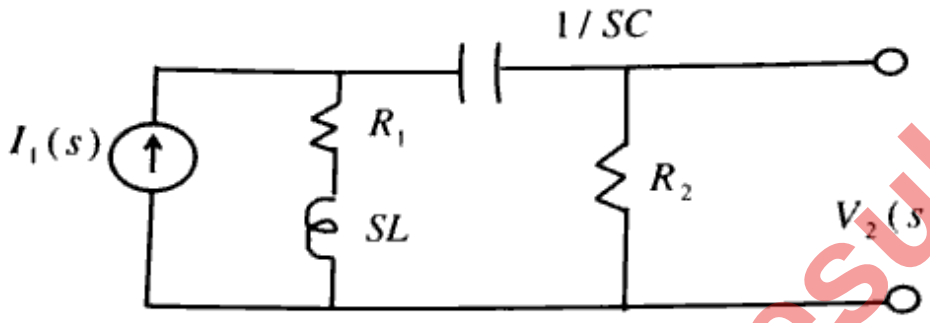

Fig . – 4

(b) For Network shown in fig.5. Compute [8

(i) $G_{21}(s) = \frac{V_2(s)}{V_1(s)}$,

(ii) $\alpha_{21}(s) = \frac{I_2(s)}{I_1(s)}$

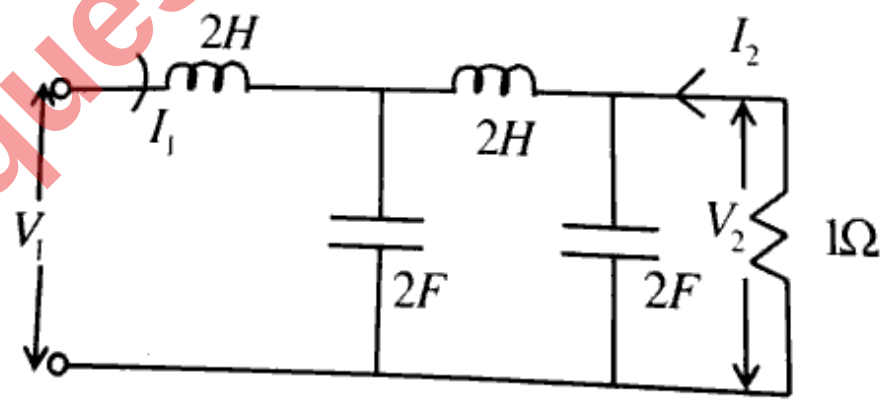

Fig.–5

OR

Q.2 (a) A series RLC circuit has for its driving point admittance pole zero diagram as shown in fig.6 find the value of R,L,C [8]

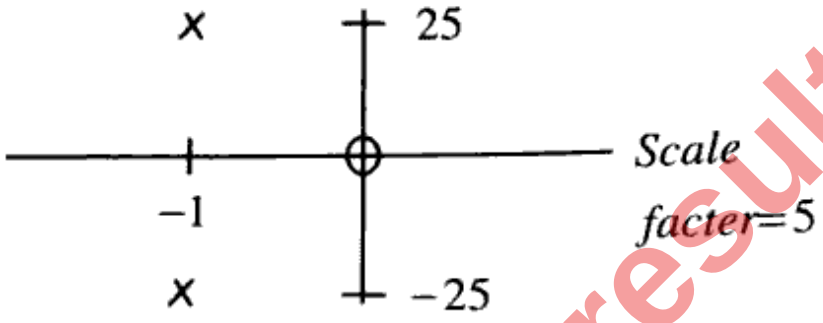

Fig.−6

(b) If Laplace transform of a voltage V (t) is

$$V(s) = \frac{4(s+1)}{(s+2)(s+3)}$$

Draw pole – zero of this function and Determine V(t) [8]

UNIT-III

Q.3 (a) Find the range of values of a so that $P(s) = S^4 + S^3 + 4S^2 + 2S + 3$ is Hurwitz. [6]

(b) Write down the property of positive real function and determine whether the function is

$$Z(s) = \frac{2s^2+5}{s(s^2+1)}$$ is P. r. or not [10]

Q.3 (a) An Impedance function is given by

$$Z(s)=\frac{(s+1)(s+4)}{s(s+2)(s+5)}$$

Find R – C representation of Cauer – I and Cauer – II forms. [8]

(b) Synthesize the Impedance $Z(s)=\frac{K(s^2+1)(s^2+9)}{S(s^2+4)}$ In Foster – I and Foster – II forms if $Z(-2)=\frac{-130}{16}$ [8]

UNIT-IV

Q.4 (a) Find Z – parameters for the Network shown in fig.7 [8]

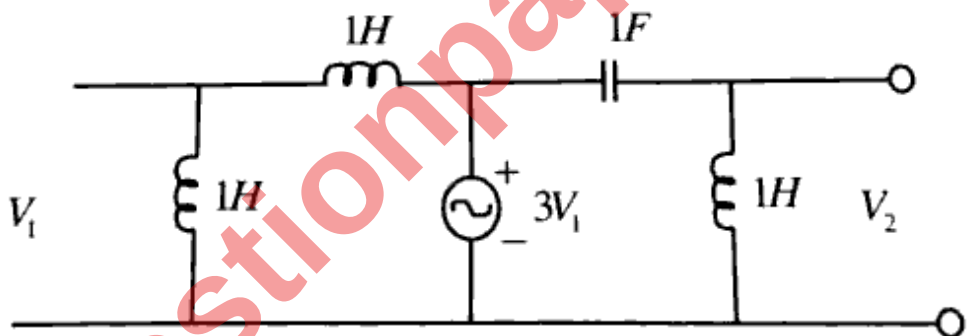

Fig.–7

(b) Define open circuit and short circuit Impedances and also calculate these Impedances in term of ABCD parameters. [8]

OR

Q.4 (a) Show that when two 2 – port Networks N_1 and N_2 are connected in parallel, the equivalent Y – parameters of the combined network is the sum of Y – parameters of each individual two – port network. [8]

(b) For the Lattice two port network of fig.8 find the Image Impedance and Image Transfer Constant. [8]

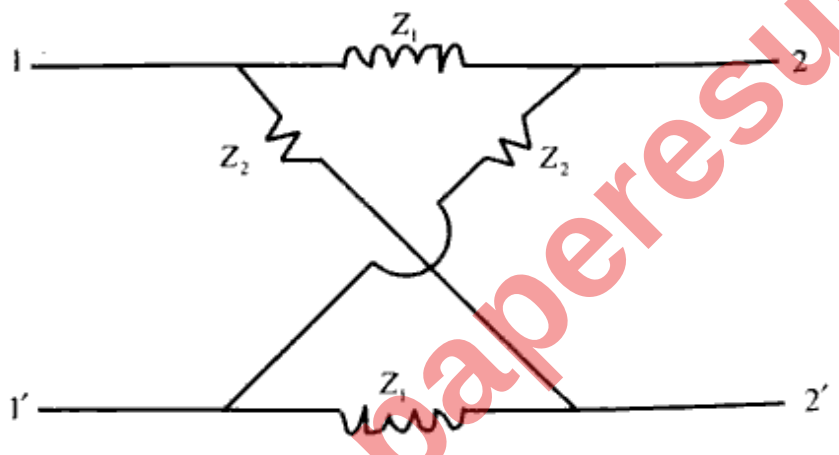

Fig.–8

UNIT-V

Q.5 (a) Design m – derived T and π section of Low Pass filter having a design Impedance 600 ohm and cut off frequency of 2000 Hz and a frequency of infinite alternation f_∞ = 2100Hz. [8]

(b) Write down short note on active filter. [8]

OR

Q.5 (a) Derive the value of characteristic Impedance for a T type constant K low pass filter. [8]

(b) Design a prototype section of band pass filter having cut off frequency of 1000Hz and 5000Hz and design Impedance of 600Ω. [8]
