Total No. of Questions : 8]

SEAT No. :

P-1504

[Total No. of Pages : 5

[6002]-132

S.E. (Electrical Engineering)

NETWORK ANALYSIS

(2019 Pattern) (Semester - IV) (203147)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7or Q.8.***
2) ***Neat diagram must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of calculator is allowed.***
5) ***Assume suitable data, if necessary.***

Q1) a) Obtain the expression for current flowing through Inductor in series RL circuit and voltage across capacitor in series RC circuit connected to a d. c. voltage V for t > 0. Assume initial current flowing through Inductor is zero. **[10]**

b) The switch is closed at t = 0 for the network shown in Fig. No.1 Find i(t), $\frac{di(t)}{dt}$ at t=0+, if inductor has zero current flowing through it initially is zero. **[7]**

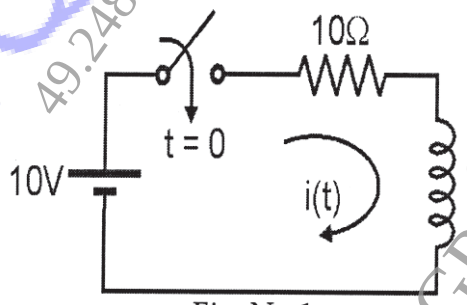

Fig. No.1

OR

P.T.O.

Q2) a) A series R-L-C circuit shown in fig. No.2, find current i(t) using conventional method. The switch is closed at t = 0. **[10]**

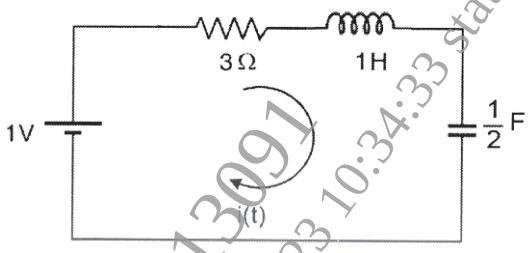

Fig. No.2

b) What is time constant? Explain time constant in case of series R-C and series R-L circuit. **[7]**

Q3) a) State any six properties of Laplace Transform. **[6]**

b) Find Laplace Transform of the following : **[6]**

i) e^{3t} cosh $4t$ and ii) t sin $5t$

c) Using Laplace Transform solve differential equation **[6]**

$$2\frac{d^2i(t)}{dt^2}+7\frac{di(t)}{dt}+6i(t)=0$$ with $I(0^-) = 0$ and $I'(0^-)=1$

OR

Q4) a) A series RL circuit in Fig No.3, the switch is closed at t=0. Find the expression for i(t) using Laplace Transform method. **[6]**

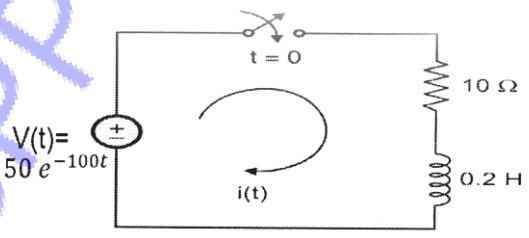

Fig. No.3

b) Find Laplace Transform of the waveform given in Fig No.4. **[6]**

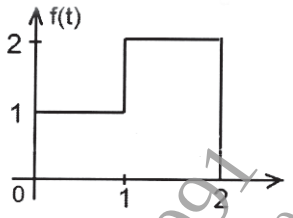

Fig. No.4

c) Find the inverse Laplace of given. **[6]**

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

Q5) a) Design constant K high pass filter T and π section having f_c = 5kHz and nominal characteristic R_0 = 600Ω. **[9]**

b) What is Low pass filter? Derive the expression for the cut-off frequency of prototype High pass filter in terms of L and C. **[8]**

OR

Q6) a) Find the transmission parameters of the network shown in Fig. No.5. **[9]**

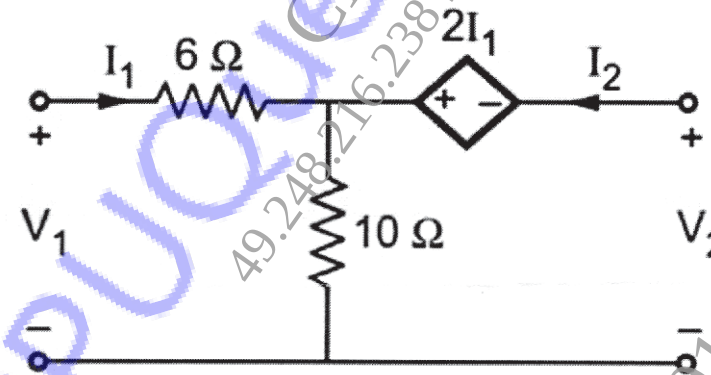

Fig. No.5

b) Express Z-parameters in terms of ABCD parameters. **[8]**

Q7) a) Find Driving point Admittance Y(S) of given network Fig. No.6. **[10]**

$$\left[Y(s) = \frac{1}{Z(s)} \right].$$

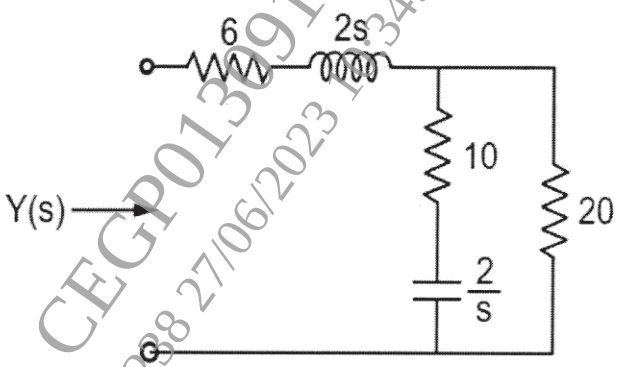

Fig. No.6

b) Define the following terms: **[8]**

i) Driving point Impedance

ii) Driving Point Admittance

iii) Voltage Transfer function

iv) Current transfer function

OR

Q8) a) Obtain the impedance function Z(s) for which pole-zero diagram is given in Fig. No.7 Z(∞) =1. **[10]**

$$\left[Z(s) = \frac{H(s - Z_1)(s - Z_2 \ldots.)}{(s - P_1)(s - P_2 \ldots.)} \right]$$

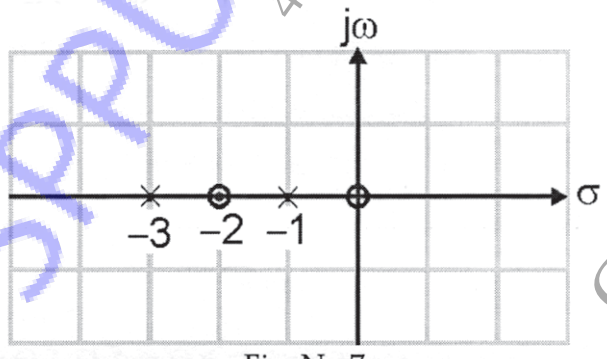

Fig. No.7

b) Define the following terms : **[8]**

i) Transfer impedance function

ii) Transfer admittance function

iii) Poles of system function

iv) Zeros of system function

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