Reg. No. : | | | | | | | | | | | |

A 1214

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2008.

Third Semester

Electronics and Communication Engineering

EC 231 — NETWORK ANALYSIS AND SYNTHESIS

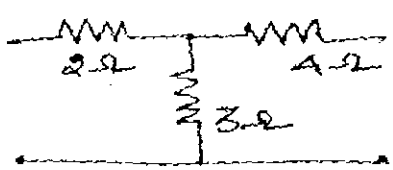
Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. What is Transfer function?

2. Find the Z parameters for the circuit.



3. What are the advantages of PSPIECE?

4. Compute e^{AT} for $\begin{bmatrix} 0 & 2 \\ -1 & 0 \end{bmatrix}$.

5. What are zeros of Transmission?

6. List out the properties of LC network.

7. What is the use of frequency transformation?

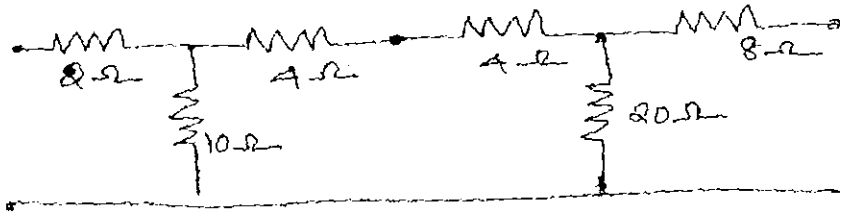
8. List out the ideal characteristics of OP-Amp.

9. What is normalization in filter design?

10. Compare the passive filters and active filters.

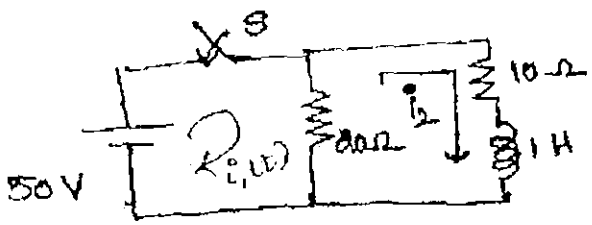
PART B — (5 × 16 = 80 marks)

11. (a) Find the transmission parameters for the cascaded network



Or

(b) Obtain the equations for $i_1(t)$ and $i_2(t)$ when the switch is closed at $t = 0$ for the given circuit.



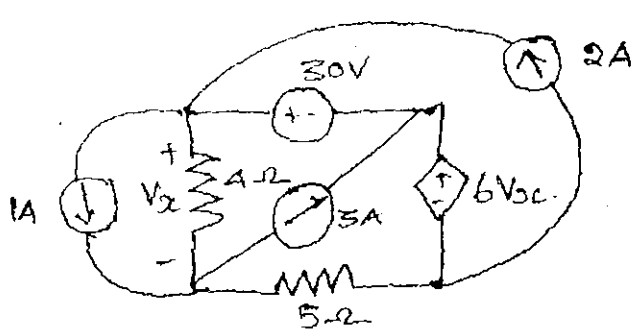
12. (a) Find the time response for unit step input of a system.

$$\dot{X}(t) = \begin{bmatrix} 0 & 1 \\ -2 & 3 \end{bmatrix} X(t) + \begin{bmatrix} 0 \\ 5 \end{bmatrix} u(t)$$

$$Y(t) = \begin{bmatrix} 0 & 1 \\ -2 & 3 \end{bmatrix} X(t) \text{ and } Y(0) = \begin{bmatrix} 1 \\ 0 \end{bmatrix}.$$

Or

(b) Find the value of V_x in the circuit of figures shown below using Graph theory.



13. (a) Find the two foster realizations of $Z(S) = \dfrac{4(S^2+1)(S^2+16)}{S(S^2+4)}$.

Or

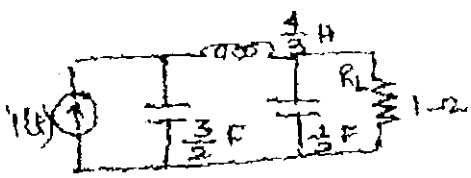
(b) (i) Test whether the following polynomial is Hurwitz $S^4 + 2S^3 + 2S^2 + 6S + 10$. (8)

(ii) Check the positive realness of the following function $\dfrac{(S^2+2S)}{(S^2+1)}$. (8)

14. (a) Synthesis the given transfer function $Z_{21} = \dfrac{1}{S^3+2S^2+2S+2}$.

Or

(b) Convert the given low pass filter in to high pass filter with following specifications : $W_C = 10^6 \text{ rad/sec}, R_L = 500\ \Omega$



15. (a) Design a second order Low-pass butter worth active filter with a cut off frequency of 4.5 KHZ with pass band gain 2.

Or

(b) Design a high pass active filter with a cut off frequency of 15 KHZ with pass band gain 1.5.
