MANAV RACHNA
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MANAV RACHNA UNIVERSITY
FORMERLY MANAV RACHNA COLLEGE OF ENGINEERING
NAAC ACCREDITED A GRADE INSTITUTION
Declared as State Private University under section 2f of the UGC act, 1956

DEPARTMENTOF ELECTRONICS AND COMMUNICATION

"T3 Examination, MAY-2018"

Semester:4TH **Date of Exam**: 15/05/2018
Subject:Network Analysis and Synthesis **Subject Code**:ECH-211
Branch: ECE **Session**:II
Course Type: CORE **Course Nature:** HARD
Time: 3 HOURS**Program:** **B.TechMax.Marks**:**80**

Note: All questions are compulsory fromPart A (2*10=20 Marks
Attempt ant two question two Questions from Part B(15 Marks each).Attempt ant two question two Questions from Part C (15 Marks each).

PART-A

1(a). Identify the Filter for the Network. (fig. 1)

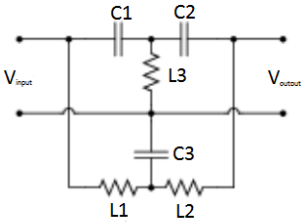

fig. 1

(b). In Constant K type filter what is meant by 'Constant K'.
(c). For constant K type BSF, draw the Characteristic impedance vs Frequency plot.
(d). Design a constant K-high pass Filter T and π-section having $f_c = 5kHz$ and characteristic impedance $R_0 = 600\Omega$.
(e). Draw the m-Derived HPF circuit.
(f). Find the driving point impedance(Z(s)) for the given Network (fig. 2)

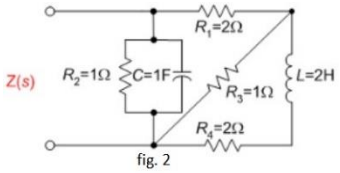

fig. 2

(g). For the pole zero plot find the Transfer function of the system and also determine from the plot whether the system is stable or not. (fig. 3)

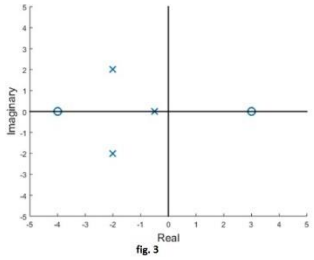

fig. 3

(h). Define the conditions for stability, instabilities and marginally stability in terms of location of polesand zeros.

(i). check whether the given polynomial P(s) = $s^4 + s^3 + 2s^2 + 3s + 2$ is Hurwitz or not.
(j). check the positive realness of the function Y(s) = $\frac{s^2+2s+20}{s+10}$.

PART-B

2.(a). What are the properties of Passive Filters. (5)

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(b). Find out the cut off frequency of Prototype LPF. And draw its Characteristic vs frequency plot. (10)

3. Design a prototype band pass filter to match a load of 600Ω and to allow frequencies between 3kHz and 6kHz. (15)

4.Design an m-derived LPF to match a line having characteristic impedance of 500 Ω and to pass signals up to 1kHz with infinite attenuation occurring at 1.2 kHz. (15)

PART-C

5.(a) What are the Properties of Hurwitz polynomial. (5)

(b) Check whether the given polynomial $P(s)=s^7+3s^5+s^3+2s$ is Hurwitz or not. (10)

6.The driving point impedance of a one port LC network is given by $Z(s)=\frac{8(s^2+4)(s^2+25)}{s(s^2+16)}$ obtain the first and second Foster form of equivalent networks. (15)

7. (a) The driving point impedance of a network is given by $Z(s)=\frac{s^3+4s}{s^2+2}$. Realize the Network. (5)

(b) Realize the network function $z(s)=\frac{(s^2+2)(s^2+4)}{s(s^2+3)}$ in cauer-2 form. (10)

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