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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_

**End Semester Examination – Nov/Dec - 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **12EC209** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **NETWORK ANALYSIS & SYNTHESIS** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | | **Marks** | |
| **PART-A(10X1=10 MARKS)** | | | | |
| 1. | Define ‘transfer impedance’ of a two port network. | | (1) | |
| 2. | Write the necessary condition for a driving point function with regard to the degree of the numerator polynomial P(s) and the denominator polynomial Q(s). | | (1) | |
| 3. | If G(jω) =R(ω)+ j X(ω), express | G(jω)| and ∠ G(jω) in terms of R(ω)and X(ω). | | (1) | |
| 4. | Define complex locus. | | (1) | |
| 5. | If ‘n’ is the number of nodes and ‘b’ is the number of branches then number of twigs \_\_\_\_\_\_\_\_\_\_\_ number of links \_\_\_\_\_\_\_\_\_\_\_. | | (1) | |
| 6. | Define Duality of a Network. | | (1) | |
| 7. | Give one application of ABCD parameters. | | (1) | |
| 8. | Give the expression for the cut off frequency of constant K high pass filter. | | (1) | |
| 9. | In a Hurwitz polynomial, all coefficients are\_\_\_\_\_\_\_\_\_\_\_\_\_ | | (1) | |
| 10. | In the first Foster form, the presence of first element capacitor Co indicates pole at \_\_\_\_\_\_\_. | | (1) | |
| **PART B(5 X 3= 15 MARKS)** | | | | |
| 11. | Give any three properties of transfer functions. | | | (3) |
| 12. | Sketch the amplitude and phase characteristics for Y(s) =  for different values of frequency w, using pole zero plot. | | | (3) |
| 13. | Draw the dual of the following circuit.  +  R  i  V  -  L | | | (3) |
| 14. | The Z parameters of a two port network are Z11 = 6Ω, Z22=4Ω, Z12 = Z21 = 3Ω,  Find the ABCD parameters. | | | (3) |
| 15. | Write any three properties of Hurwitz polynomials. | | | (3) |
| **PART C(5 X 15= 75 MARKS)** | | | | |
| 16. |  | For the given network function, draw the pole zero diagram and hence obtain the time  domain response. Verify the result analytically.  I(s) = | | (15) |
| (OR) | | | | |
| 17. |  | For the network shown in figure, determine Z11(S), Z21(S) and G21(S).  2 H  ½ F  1  2  5Ω 2Ω | | (15) |
| 18. |  | Draw the complex locus plot of the admittance function of the RLC series circuit. | | (15) |
| (OR) | | | | |
| 19. |  | Draw poles and zeros for I(s) =  and use it to plot amplitude and phase characteristics for w=0, 1, 1.5, 2 and 3. | | (15) |
| 20. |  | Draw the graph of the network shown in figure. Select node pair potential variable and formulate cut-set matrix. Write the equilibrium equation.  4H  Es  2 F  1 H  1Ω  -  +  M = 1 H | | (15) |
| (OR) | | | | |
| 21. |  | Find the branch currents and branch voltages for the given network using Tie-set schedule.  5V  1Ω  1Ω  1Ω  2Ω  2Ω | | (15) |
| 22. |  | The Z parameters of a two port network are Z11 =10Ω ; Z22 = 15Ω ;  Z12=Z21 =5Ω.Find the equivalent T network and ABCD parameters. | | (15) |
| (OR) | | | | |
| 23. |  | Design a high pass filter having a cut-off frequency of 1KHz with a load resistance of 600Ω. Draw T-section and π-section. | | (15) |
| 24. |  | Realize the given driving point impedance function using cauer forms (cauer I and II) | | (15) |
| (OR) | | | | |
| 25. |  | Find the two Foster realizations of the given function. | | (15) |