Roll No.....

National Institute of Technology Delhi

Make up Examination

Name of Specialization: EE/ECE
Course Name: Network Analysis & Synthesis
Course Code: EEL-201

Year: 2nd/ Semester: III
Maximum Marks – 50
Total Time: 3:00 Hours

Note:

- All Questions are compulsory.
- Assume data where ever required.

Section A (*01 mark each and all parts are compulsory*)

Q1) Derive the relationship between line current and phase current for delta connection. (1)

Q2) What is the condition of reciprocity for T and g parameters. (1)

Q3) What do you mean by circuit. (1)

Q4) Write the relation between the line and phase value of voltage in a balanced delta connection. (1)

Q5) What are the open circuit impedance parameters of a two-port network? (1)

Q6) Define transfer function. (1)

Q7) Maximum power transfer occurs at a

(a) 100% efficiency (b) 50% efficiency (c) 25% efficiency (d) 75% efficiency (1)

Q8) State compensation theorem. (1)

Q9) Write the expression for Millman's equivalent source of *n* number of parallel connected sources. (1)

Q10) Define Thevenin's theorem (1)

Section B (*Any four (04) are to be attempted*)

Q11) Two networks have general ABCD parameters as shown:

Parameter	Network-1	Network-2
A	1.50	5/3
B	11Ω	4Ω
C	0.25 siemens	1 siemens
D	2.5	3.0

If the two networks are connected with their inputs and outputs in parallel, obtain the admittance matrix of the resulting network. (5)

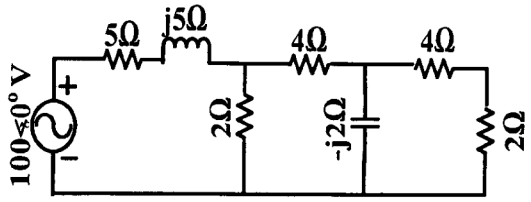
Q12) Test whether the following polynomial is Hurwitz or not with proper reason.

$s^4 + 8s^2 + 32$ (5)

Q13) How the power factor of 3-phase balanced load can be determined using two wattmeter method. Discuss the effects of power factor on wattmeter reading when measuring 3-phase power using two wattmeter method. (5)

Q14) Write the properties of RL impedance/ RC admittance function. (5)

Q15) In the circuit shown, determine the branch currents and voltages and hence verify Tellegen's theorem.



(5)

Section C (*Any two (02) are to be attempted*)

Q16) Find the limits of K so that the polynomial $s^3+14s^2+56s+K$ may be Hurwitz. (10)

Q17) For a given function, determine Foster Form-I & II. (10)

$$Z(s)=\frac{(s+1)(s+3)(s+5)}{s(s+2)(s+4)(s+6)}$$

Q18) Determine whether the function is a positive real functions (PRF) and hence realizable. (10)

$$F(s)=\frac{s^2+6s+5}{s^2+9s+14}$$