PVP 14

Code: EC3T4

II B.Tech - I Semester – Regular Examinations – December 2015

NETWORK ANALYSIS AND SYNTHESIS
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

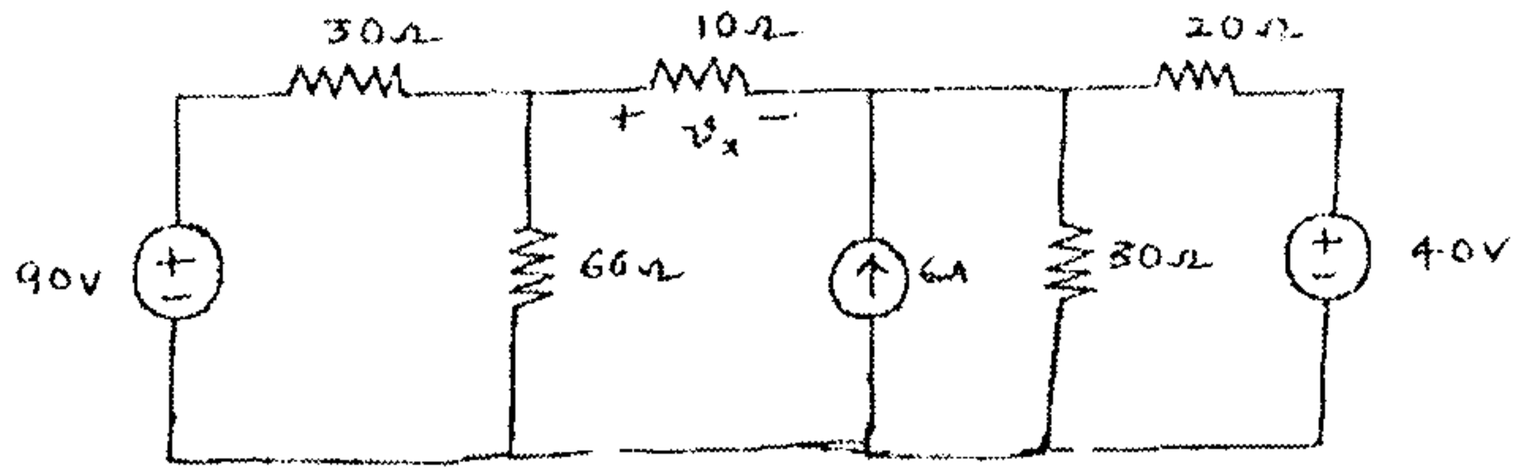
11x 2 = 22 M

1. a) What is a Supermesh? Write the steps involved to write a supermesh equation for a given network.
   b) State Tellengen's Theorem.
   c) What are planar and non-planar graphs?
   d) What is the condition for symmetry in ABCD parameters?
   e) Write the properties of an incidence matrix.
   f) Write the solution of the current for a DC response of an R-C series circuit.
   g) What do you understand by transient and steady state parts of a response? How they can be identified in a general solution?
   h) Write the expression of ABCD parameters in terms of Z-parameters.
   i) Write the necessary conditions for driving point function.
   j) What is a network function? When do you say that the network function is said to be stable?
   k) What are the properties of Hurwitz polynomials?

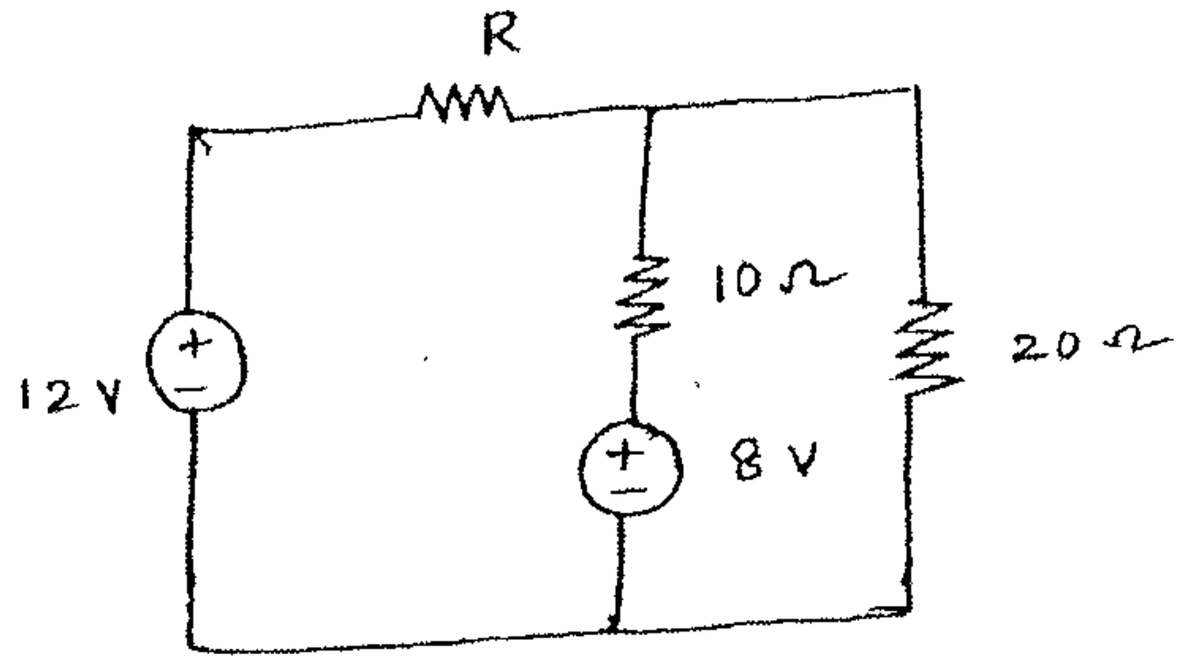
PART – B

Answer any ***THREE*** questions. All questions carry equal marks. 3 x 16 = 48 M

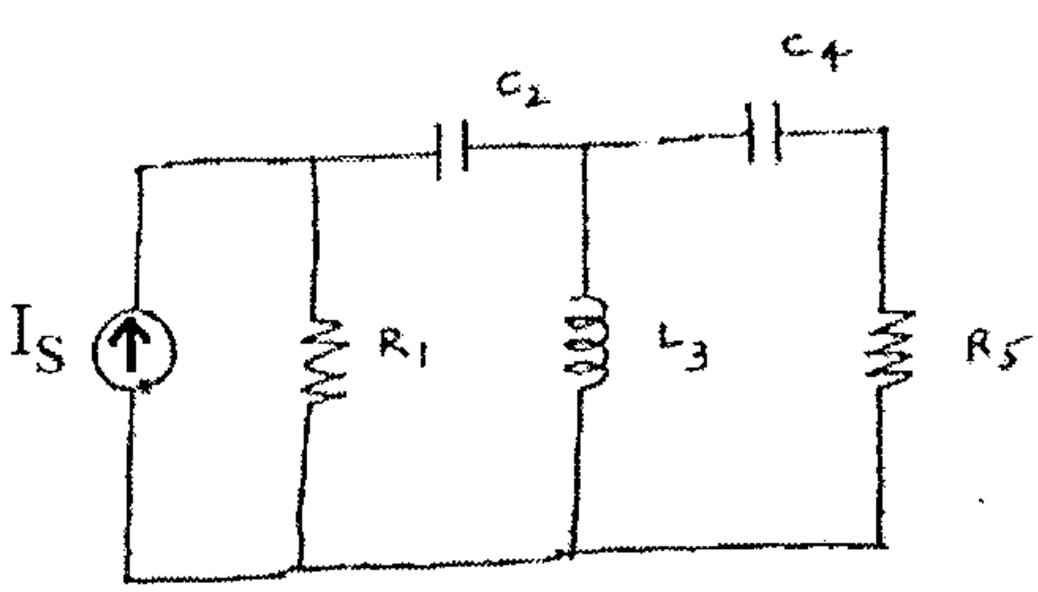
2. a) Use Superposition theorem to obtain v_x, in the circuit shown below. 8 M

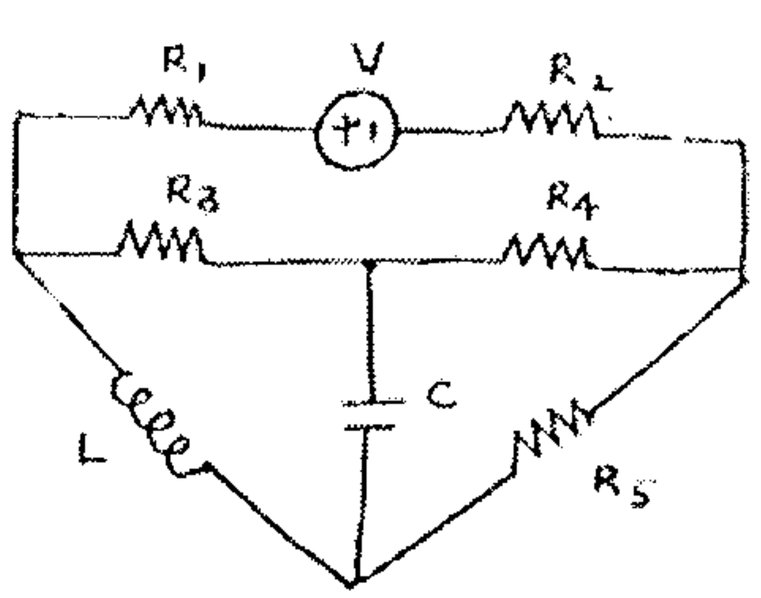


b) Compute the value of R that results in maximum power transfer to the 10 Ω resistor for the circuit shown below. Find also the maximum power. 8 M

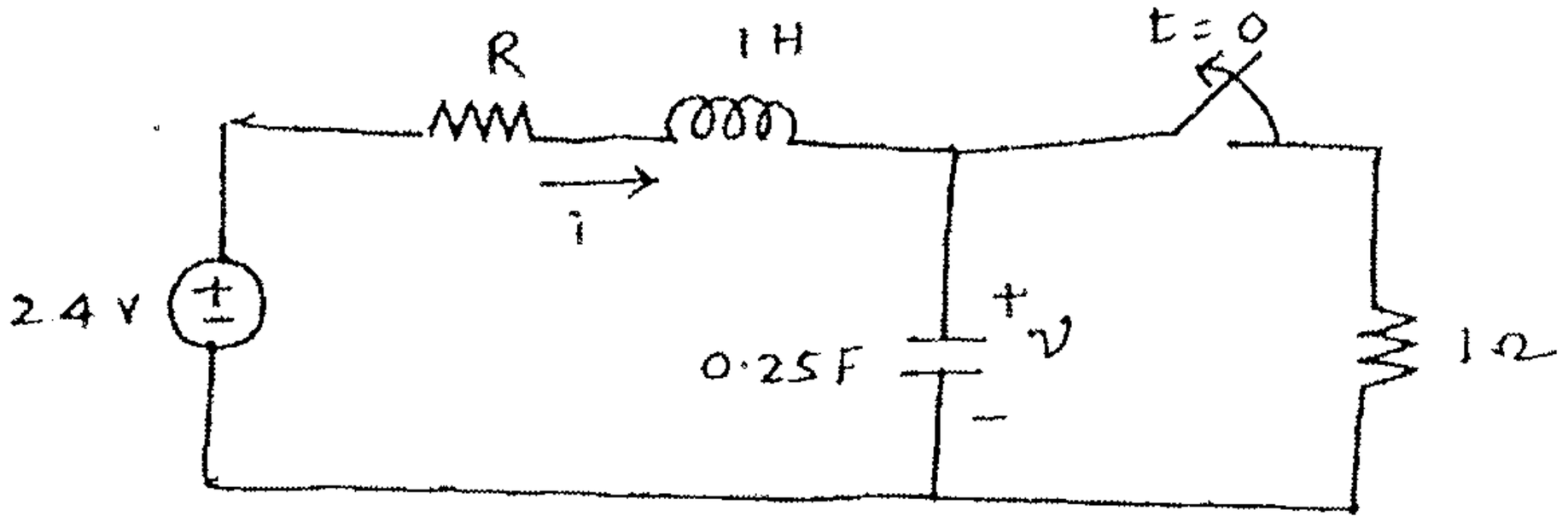


3. a) Draw the dual for the following networks. 8 M

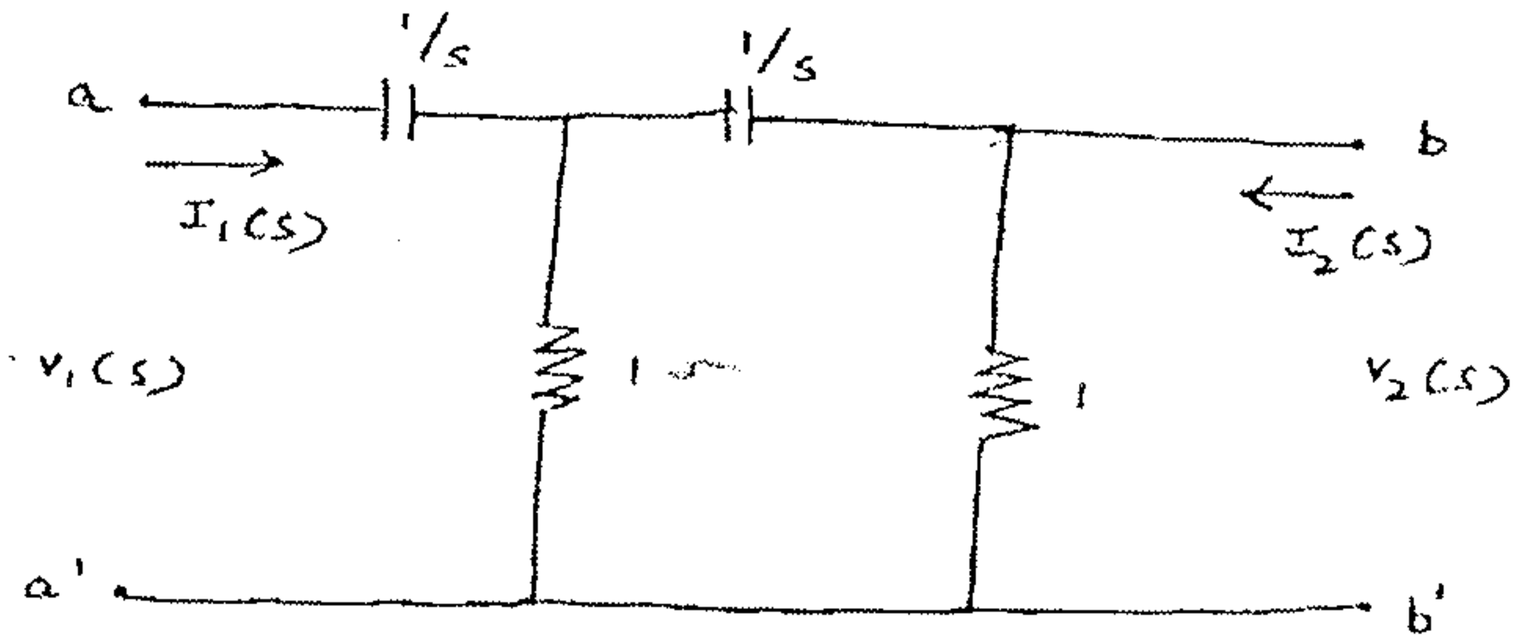




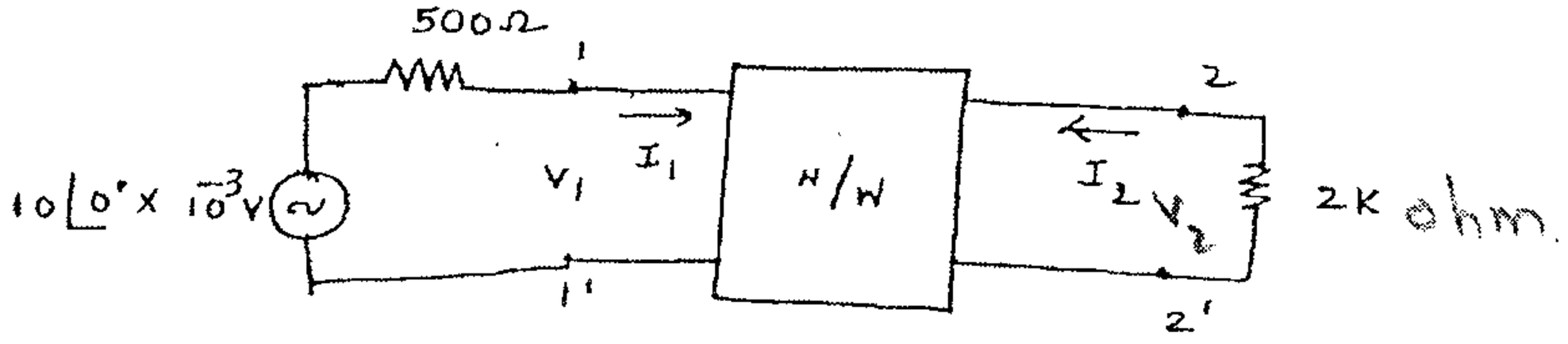
b) For the circuit shown below, find v(t) and i(t) for t>0.
Consider these cases: R=5Ω, R=4Ω and R=1Ω. 8 M



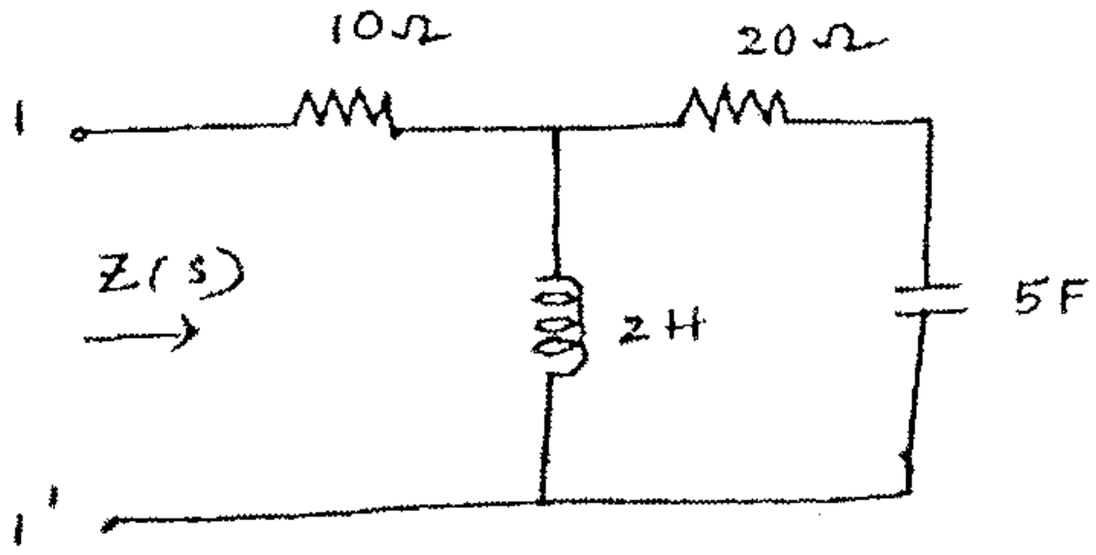
4. a) Find the Z parameters of the RC ladder network shown in circuit below. 8 M



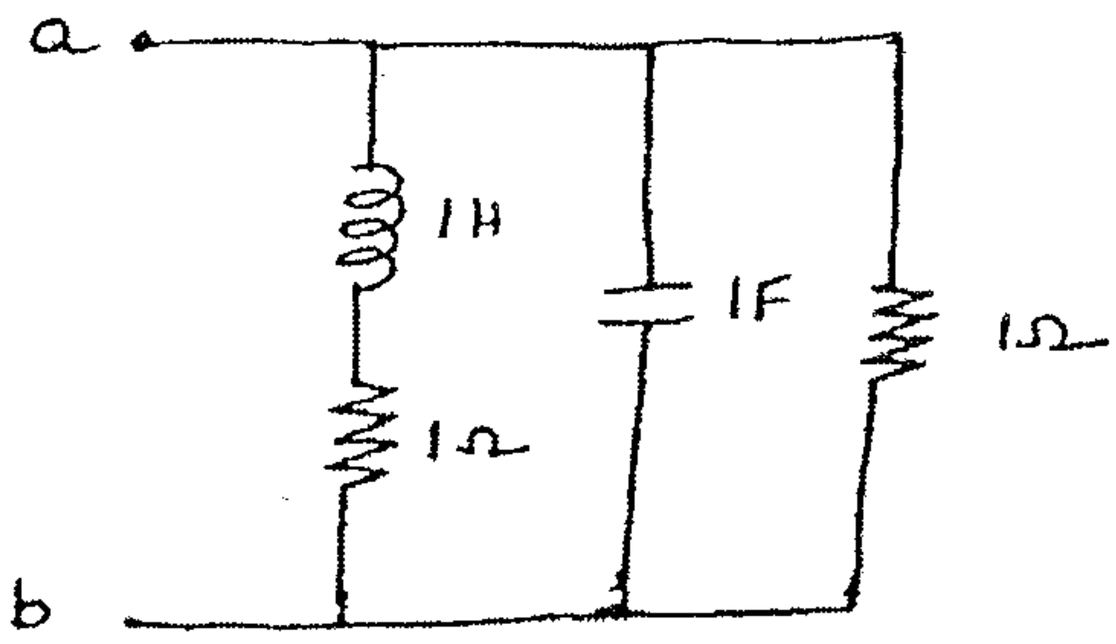
b) The hybrid parameters of a two port network shown in figure are h_{11}=0.003Ω; h_{12}=h_{21}=100; h_{22}=50μ mho. Find V_2 and Z parameters of the network. 8 M



5. a) For the network shown, determine the transform impedance Z(s). 8 M



b) Find the driving point impedance of the network shown in the figure. Also find the zeros and poles of the network and locate the in the s-plane. 8 M



6. a) What are the properties of positive real functions? Explain with examples. 8 M

b) Realize the following function having impedance function as $z(s) = \frac{s^2+4s+40}{s(s+10)}$. 8 M