Printed Pages: 6 **EC-404**

(Following Paper ID and Roll No. to be filled in your Answer Books)	
Paper ID : 160407	**Roll No.** ☐☐☐☐☐☐☐☐☐☐

B.TECH.

Theory Examination (Semester-IV) 2015-16

NETWORK ANALYSIS AND SYNTHESIS

Time : 3 Hours ***Max. Marks : 100***

Note : Attempt all questions

Section-A

1. Attempt all question. (2×10=20)

(a) Is initial value theorem applicable if degree of numerators is less than degree of denominator? Explain with any one example.

(b) Define link, Twigs and Datum node in Graph Theory.

(c) Write properties of L C Admittance functions.

(d) Write properties of positive real function.

(e) Explain incidence matrix with example.

(f) Define open circuit parameters.

(g) What do you mean by Transfer impedance?

(h) Write the statement of Millman theorem using complex load.

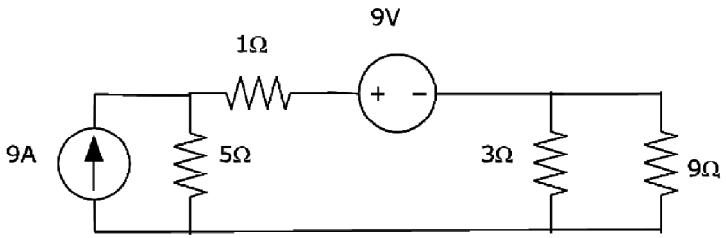
(i) What is the condition to transfer maximum power?

(j) Check whether the given polynomial $P(s) = s^4+s^3+2s^2+4s+1$ is Hurwitz or not.

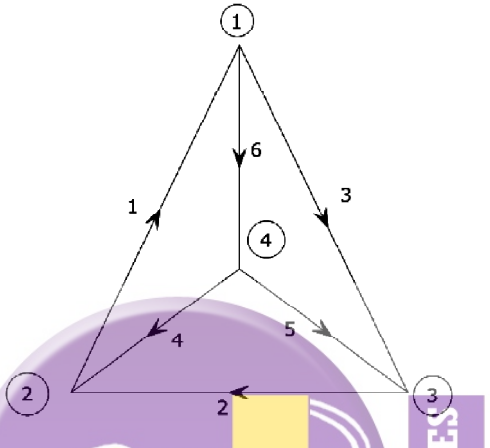
Section-B

2. Attempt any five parts of the following question. [10×5=50]

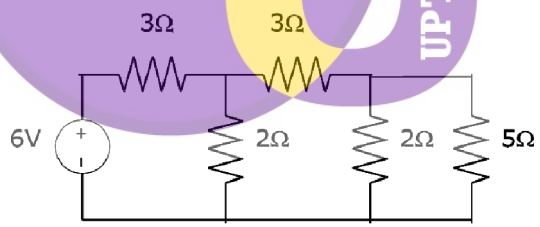
(a) State and explain superposition theorem. Find the current in 3Ω resistance using superposition theorem for the circuit shown in Fig.



(b) What do you mean by oriented graph, evaluate incidence matrix & cut set matrix of the graph given in fig Below.

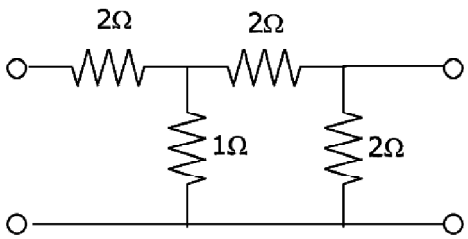


(c) Write the statement of Norton theorem. Find the current in 5Ω resistor by using this theorem as shown in fig.



(d) Derive the Max Power Transfer theorem, & prove that for max power transfer internal resistance equal to load resistance.

(e) Determine the Z parameters of circuit shown in figure .



(f) (i) Explain different type of network parameters like z, h, y etc.

(ii) Write the properties of transfer function.

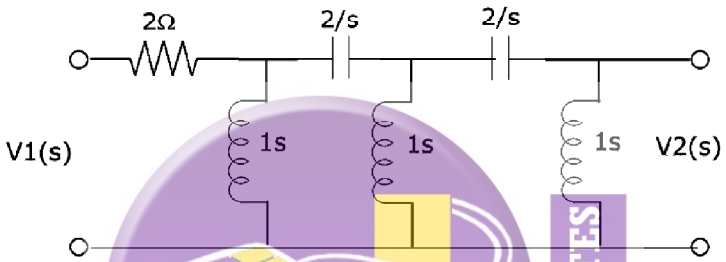
(g) Explain the properties of Hurwitz polynomial & check whether polynomial Hurwitz or not? $P(s) = S^4+S^3 +2S^2 +3S+2$

(h) Determine whether the function $Z(s)= 2s^2+5/s(s^2+1)$ is positive real or not. Also write the property of positive real function.

Section-C

Attempt any two of following questions. (15×2=30)

3. Determine the voltage transfer function V2(s) / V1(s) for the network shown in figure below :



4. (i) Using the Foster (I), synthesize the function

$Y(s) = (s^2+5)(s^2+13)/s(s^2+9)$

(ii) Diagnose whether the following impedance function represents a RL or RC network and find its first cauer form

$Z(s)= (s+4)(s+6)/(s+3)(s+5)$

5. Define the following :

(i) Cut-set matrix

(ii) branch

(iii) tree

(iv) incidence matrix