Registration No : | | | | | | | | | | |

Total Number of Pages : 02 **B.Tech**

BEES2211

3rd Semester Back Examination 2018-19

NETWORK THEORY

BRANCH : AEIE, AERO, CSE, ECE, EEE, EIE, ELECTRICAL, ETC, IEE, IT, ITE

Time : 3 Hours

Max Marks : 70

Q.CODE : E993

Answer Question No.1 which is compulsory and any five from the rest.

The figures in the right hand margin indicate marks.

Q1 **Answer the following questions :** **(2 x 10)**

a) Define Kirchoff's current and voltage laws.

b) State the maximum power transfer theorem.

c) Write an expression for resonance frequency and band width of series RLC circuit.

d) Write two properties of Laplace Transform.

e) Convert a star connection to delta. R_a = 1KΩ, R_b= 5KΩ, R_c= 100Ω

f) Check Whether the polynomial is stable or not
P(s)= $6s^6+8s^5+3s^4+4s^3+9s^2+12s+5$

g) State the necessary conditions for driving point functions.

h) What is the Initial &Final value of the function? $F(s) = \frac{0.24}{s(s^2+0.53s+0.617)}$

i) What is the difference between oriented graph and incident graph?

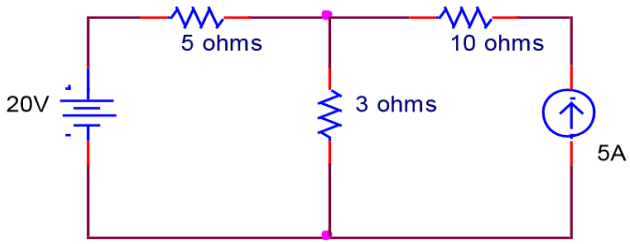
j) What is the efficiency and power produced by the network at maximum power transfer condition?

Q2 **a)** A series RL circuit with R=100Ω and L= 20H has a DC voltage of 200V applied through a switch at t=0. Find **(5)**

i. The equation for current and voltage across L and R

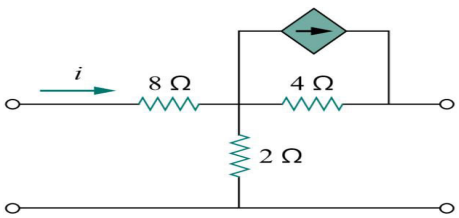
ii. The current at t=0.5sec

b) **(5)**



Find the current through 3Ω register using superposition theorem.

Q3 **a)** **(5)**



Obtain h- parameter of given circuit.

b) Sketch the waveform that is represented by **(5)**

i. I(t)= r(t)+2r(t−1)−u(t −2)−2r(t−2) +r(t−3)+u(t −4)

ii. v(t)= 3u(t)+3u(t −1)−3u(t −2)+2u(t −3)

Q4 **a)** Derive the condition of symmetricity and reciprocity condition in terms of y-parameter. **(5)**

b) Derive the condition of resonance for a circuit having a RL branch in parallelwith a RC branch. **(5)**

Q5 **a)** Explain the following term with example **(5)**

i. Incidence matrix

ii. Tie-set matrix

b) With neat diagram explain about series connection of two port network. How it is different from cascade connection. **(5)**

Q6 **a)** A function is given by $Z(s) = \frac{s^3+5s^2+9s+3}{s^3+4s^2+7s+9}$ **(5)**

Find the positive realness of the function.

b) A current transfer function is given by **(5)**

$$I(s) = \frac{5s}{(s+2)(s^2+2s+2)}$$

Obtain its time domain response from pole zero plot.

Q7 Find the First and second Foster form of the driving point impedance function **(10)**

$$Z(s) = \frac{2(s^2+1)(s^2+9)}{s(s^2+4)}$$

Q8 **Write short answer on any TWO :** **(5 x 2)**

a) Image impedance

b) Hurwitz polynomial

c) Transient analysis of Series resonant circuit.

d) Time domain behavior of pole zero plot