Registration no: | | | | | | | | | | |

Total Number of Pages: 03

B.TECH

BEES2211

3rd Semester Back Examination 2016-17

NETWORK THEORY

BRANCH(S):AEIE, CSE, ECE, EEE, EIE, ELECTRICAL, ETC, IT, ITE

Time: 3 Hours

Max Marks: 70

Q.CODE: Y644

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

The figures in the right hand margin indicate marks.

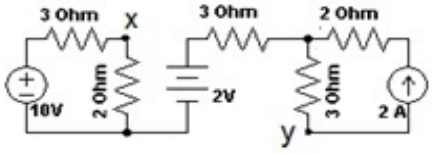
Q1 **Answer the following questions:** **(2 x 10)**

a) State Compensation theorem.

b) Test the positive realness.

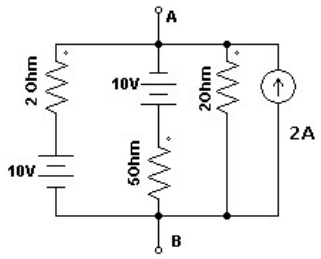
$$F(s) = \frac{s^2+8s+5}{s+2}$$

c) Find V_{xy}.



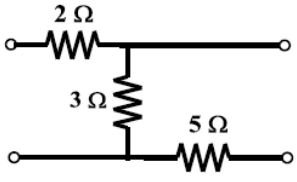
d) Define coefficient of coupling? What are their possible maximum & minimum values?

e) Convert the circuit to a single source network across A & B.



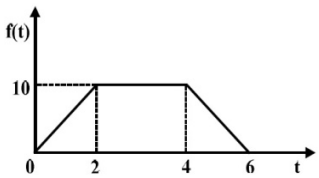
f) What do you mean by Reciprocity & Symmetry of two port network?

g) If two of such 2-port networks shown in figure are connected in series find the Z parameters of the equivalent circuit.



h) What do you mean by the term" S" used in Laplace transform?

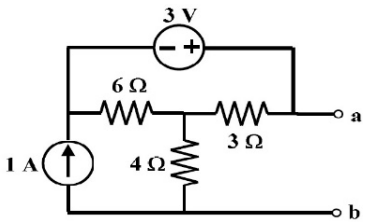
i) Find the Laplace of the wave form.



j) Which type of filter the following circuit may be and why?

Q2

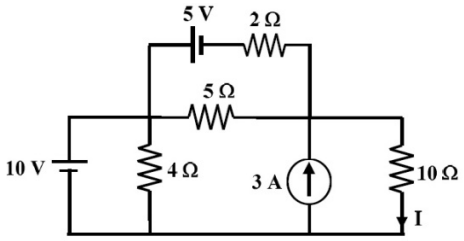
a) Find the Thevnin equivalent circuit of the circuit shown across a-b. **(5)**



b) State & explain Reciprocity theorem with examples. What are the limitations of this theorem? **(5)**

Q3

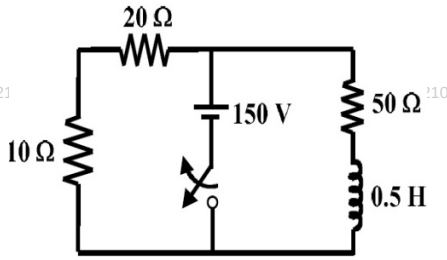
(a) Find the current I using supper position theorem **(5)**



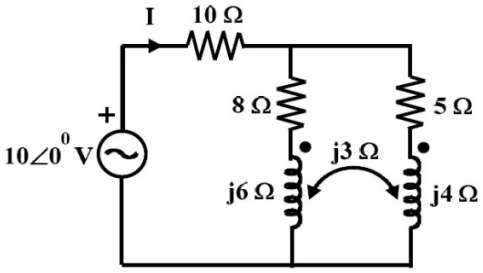
(b) Derive the condition of resonance for a circuit having a RL branch in parallel with a RC branch. **(5)**

Q4

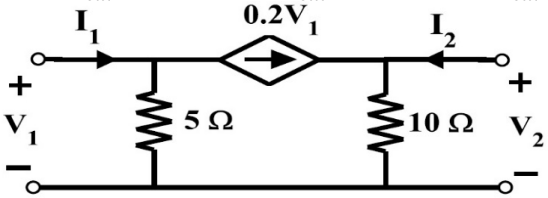
a) At t=0 switch is opened. What is the current i(t) through the 50ohm resister for the circuit shown in figure. **(5)**



b) Find I of the circuit shown in figure **(5)**



Q5 **a)** Find Z parameters of the two port network. **(5)**



b) Derive the condition of reciprocity & symmetry for a two port network in terms of hybrid parameters. **(5)**

Q6 **a)** Design a constant K-type HPF filter (both T & π) having nominal impedance of 700Ω and cut-off frequency of 6000Hz. Also determine the characteristic impedance, attenuation constant and Phase shift at 4000Hz & 10000Hz. **(5)**

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

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

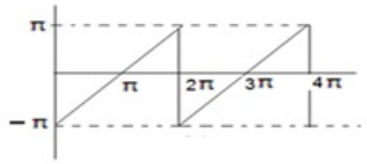
Obtain its time domain response from pole zero plot.

Q7 **a)** Synthesize the given network function in the first form of Foster and 2nd form of Cauer. $Z(s) = \frac{S(S^2+4)}{2(S^2+1)(S^2+9)}$ **(5)**

b) What are the properties of LC impedance or admittance function? **(5)**

Q8

a) Find the trigonometric Fourier series representation of the wave shown below. **(5)**



b) For an electrical network voltage & current are given below. Find the power consumed & power factor in the circuit. **(5)**

$$v = 100\sin(wt + 30) - 50\sin(3wt + 60)$$
$$i = 20\sin(wt - 30) + 15\sin(3wt + 30)$$