Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER B.TECH DEGREE EXAMINATION(R&S), DEC 2019

Course Code: EC201
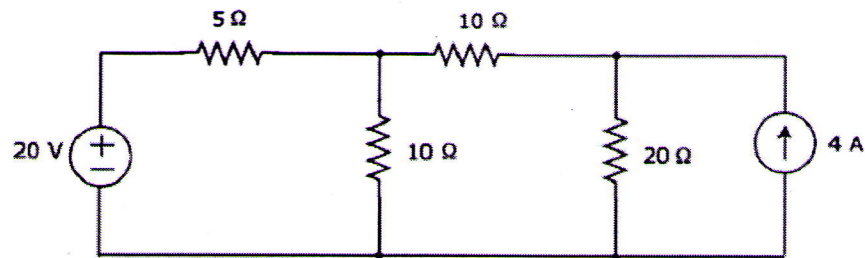
Course Name: NETWORK THEORY

Max. Marks: 100   Duration: 3 Hours

PART A
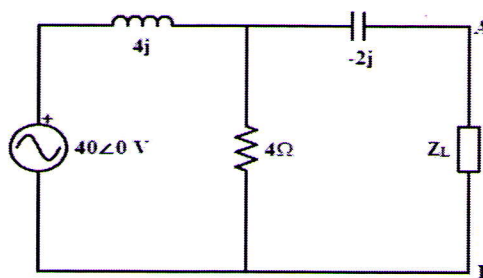### *Answer any two full questions, each carries 15 marks.*
Marks

1 a) Classify independent and dependent sources. Also mention the types of dependent sources.   (4)

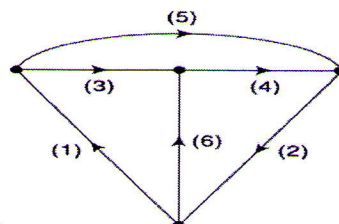b) Calculate the current through 20Ω using node analysis   (4)

fig(1)

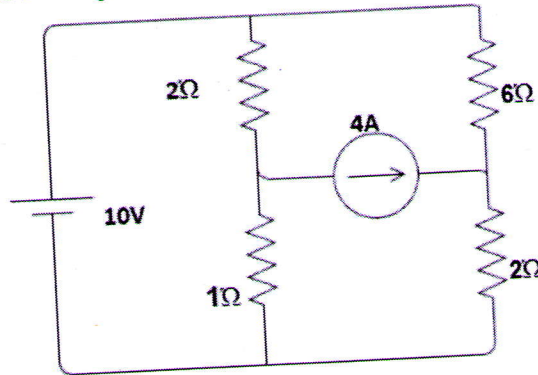c) Find the value of load and maximum power delivered to load in fig(2)   (7)

fig(2)

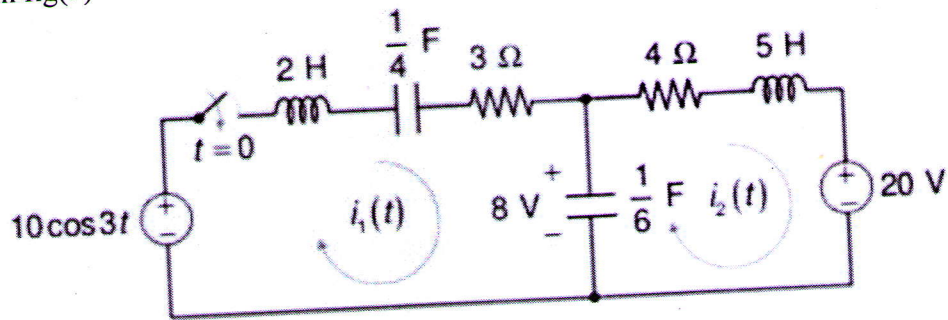2 a) Find the tie set matrix for the graph shown in fig(3)   (4)

fig(3)

(3)

b) Define Node, Tree and Link (8)

c) State and prove initial value and final value theorem (6)

3 a) Solve the circuit and find the loop currents in fig(4)

fig(4)

(3)

b) State reciprocity theorem (6)

c) Draw the laplace transformed circuit and write the mesh equations for the circuit shown
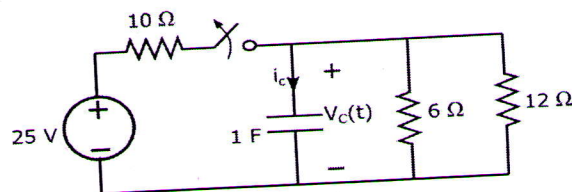
in fig(5)

fig(5)

PART B
Answer any two full questions, each carries 15 marks.

(8

4 a) Find the inverse laplace transform of

$$F(S) = \frac{21S - 33}{(S+1)(S-2)^3}$$

(7

b) Write any six properties of driving point and transfer functions. (8

5 a) The switch is opened at t = 0. Find the capacitor voltage for t > 0


fig(6)

b)   Draw the pole zero diagram of system function $\dfrac{S^3 - 7S^2 + 10S}{S^2 + S - 6}$. Also mention the   (7)

nature of the system.

6   a)   Solve the differential equation using laplace transform   (7)

$$2y'' + 3y' - 2y = te^{-2t}, \qquad y(0) = 0 \quad y'(0) = -2$$

   b)   Draw Pole Zero Plot & using pole zero plot, Find the time domain response i(t).   (8)

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

PART C
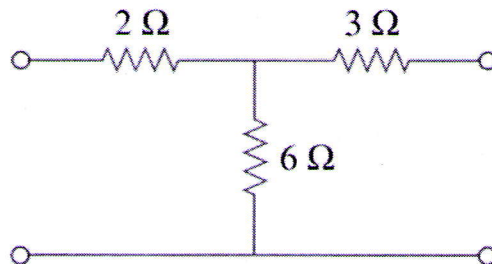### Answer any two full questions, each carries 20 marks.

7   a)   The Z parameters of a two port network areZ11=20Ω, Z12=Z21=10Ω, Z22=30Ω. Find   (9) Y and ABCD parameters.

   b)   Derive the expression for voltage amplification of single tuned circuits.   (7)

   c)   Find the equivalent inductance   (4)
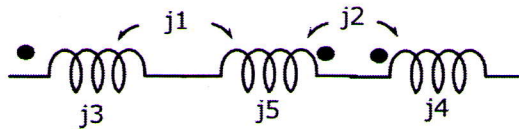
fig(7)

8   a)   Find the hybrid parameters for the network in fig(8). Also represent its hybrid model.   (6)
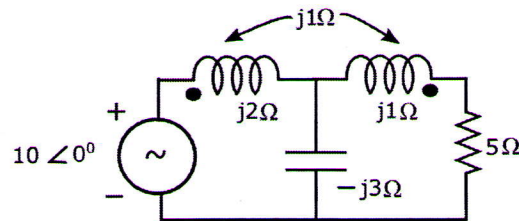

fig(8)

   b)   Explain characteristics impedance and image impedances   (6)

   c)   Find the expressions for resonant frequency, Q factor and bandwidth of parallel RLC   (8) network

9   a)   Find the Y parameters of the circuit shown and comment on the symmetry and   (7) reciprocity of the circuit.
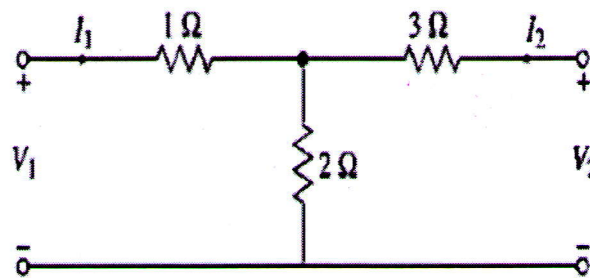
b) For the circuit shown, find the drop across 5 Ohms (7)

c) Compare and classify parallel resonance network and series resonance network (6)

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