Reg No.:_____ **00000EC201121905** Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third Semester B.Tech Degree (S,FE) Examination December 2020

Course Code: EC201

Course Name: NETWORK THEORY

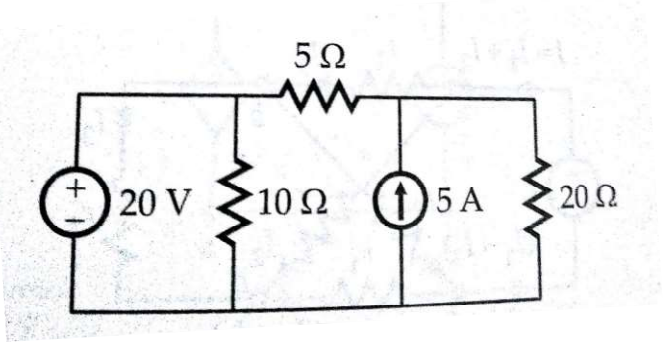
Max. Marks: 100 Duration: 3 Hours

PART A

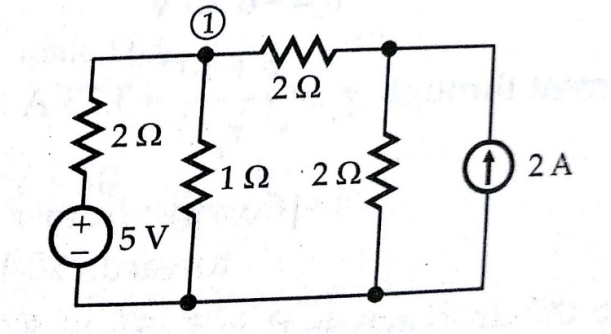
Answer any two full questions, each carries 15 marks. Marks

1 a) State and explain Thevenin's theorem and Norton's theorem. (4)

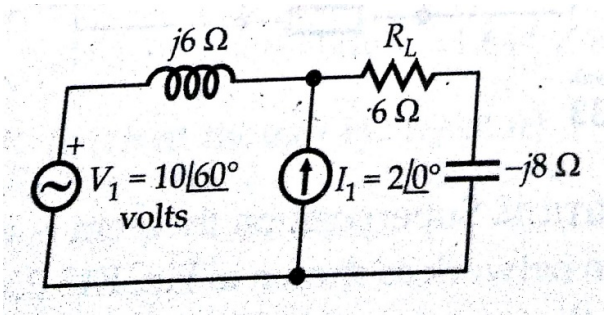
b) Find the power loss across 5Ω for the given network by using mesh analysis. (5)



c) Find the current in 1Ω by nodal analysis. (6)



2 a) Using super position theorem, find the current through 6Ω for the given network. (8)



b) Explain Complete incidence matrix and fundamental cutest matrix with an example. (7)

3 a) State and prove Initial value theorem. (3)

b) Find inverse Laplace transform of $F(s) = \frac{50}{(s+1)(s+5)}$ (4)

(c) Find the Laplace Transform of the following (8)

(i) $\cos(\omega t+\Theta)$ and (ii) $(1+ 2t\, e^{-6t})^3$

PART B

Answer any two full questions, each carries 15 marks.

4 a) Solve the differential equation using Laplace Transform $Y''+ 2y' + 3y = 0$ (8)
Given $y(0) = 1$ and $y'(0) = 0$

b) Given $I(s) = \frac{3s}{(s+1)(s+3)}$ (7)

Plot Pole zero plot and hence obtain i(t) from pole zero plot.

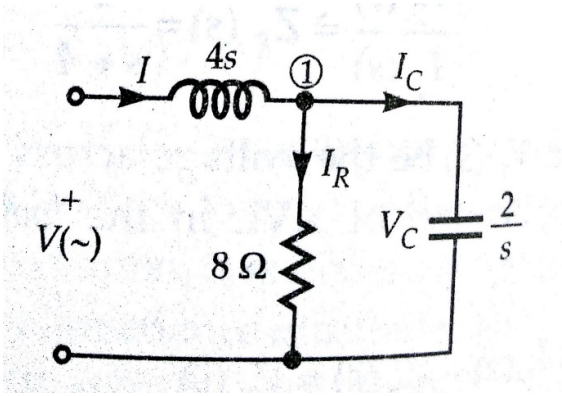
5 a) Write any five properties of driving point admiittance functions. (5)

b) A series RLC circuit with R= 300Ω L= 1 H and C= 100 Micro Farad has a constant voltage of 50 V applied at t=0. Find maximum value of current. Assume zero initial condition. (6)

c) A series RL circuit with R= 200Ω and L= 20 H is connected to a 250 V dc source. Find the transient current. (4)

6 a) Derive transient current and voltage responses of RL and RC Circuits energised by a dc voltage source of V volts. (10)

b) Find Voltage Transfer function for the given network. (5)



PART C

Answer any two full questions, each carries 20 marks.

7 a) Find the ABCD parameters for the given network. Given Z_{11}= 4 Ω, Z_{12} = 1Ω , Z_{21}= 3Ω and Z_{22} = 3Ω (8)

b) Explain hybrid parameters of two port network. (7)

c) Explain dot convention in coupled coils. (5)

8 a) Explain series and parallel connections of two port networks. (8)

b) Determine the interrelationship between hybrid and Z parameters. (6)

c) Explain the following terms (6)

(i) Bandwidth (ii) Q- factor and (iii) Selectivity

9 a) Two similar coupled coils of resistance 5Ω and self inductance 1 H are in series. This is in series with a 100 Micro Farad Capacitor. A 220V, 50 Hz source energise the circuit. Draw the dotted equivalent circuit. Calculate the coefficient of coupling so that circuit behaves as a pure resistor. (8)

b) Derive the output voltage expression for a single tuned circuit. (7)

c) A double tuned circuit is tuned to a frequency of 750 Hz. when excited with voltage source at critical coefficient of coupling, the maximum voltage across C2 = 20 V. Find the coefficient of coupling and the source voltage. (5)

Given Q_1 = 6 , Q_2 = 10 R_1 = 10Ω and R_2 = 90Ω

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