(Model Paper) **C –23, EC -305**

State Board of Technical Education and Training, A. P

Diploma in Electronics and Communication Engineering (DECE)

III Semester

Subject Name: Network Analysis

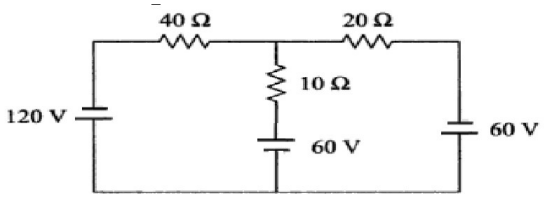
Sub Code: EC - 305

Time: 90 minutes **Unit Test I** **Max.Marks:40**

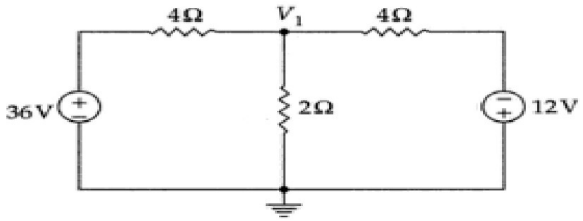
Part-A **16Marks**

Instructions: (1) Answer **all** questions.
(2) First question carries **four** marks, each question of remaining carries **three** marks

1. Fill the following blanks with one word
   a) The connecting path between two nodes is called as _____ (CO1)
   b) _____is the point where two or more elements (RLC) connected together. (CO1)
   c) The internal resistance of ideal voltage source _____ (CO2)
   d) The internal resistance of ideal current source _____ (CO2)
2. Write the mesh current equations for the network shown below (CO1)



3. Find the V_1 node voltage by applying KCL (CO1)

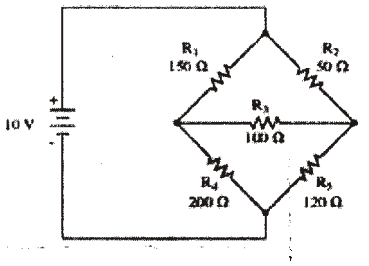


4. State Reciprocity theorem (CO2)
5. Give transformation formulas from Star to Delta (CO2)

Part-B **3×8=24**

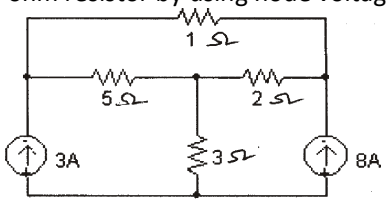
Instructions: (1) Answer **all** questions.
(2) Each question carries **eight** marks
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. (a) Solve for mesh currents using Cramer's rule for the given network below (CO1)

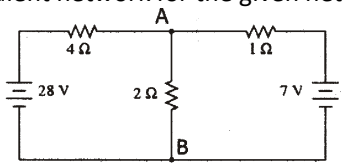


or

(b) Find the voltage across 2-ohm resistor by using node voltage analysis (CO1)

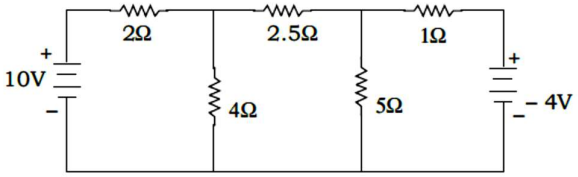


7. (a) Draw the Thevenin's equivalent network for the given network between A and B. (CO2)



or

(b) Find the current through 4-ohm resistor by using superposition theorem (CO2)



8. (a) Explain star and Delta configurations of resistances (CO3)

or

(b) Explain the duality of a network (CO1)

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State Board of Technical Education and Training, A. P

Diploma in Electronics and Communication Engineering (DECE)

III Semester

Subject Name: Network Analysis

Sub Code: EC - 305

Time: 90 minutes **Unit Test II** **Max.Marks:40**

Part-A **16Marks**

Instructions: (1) Answer **all** questions.
(2) First question carries **four** marks, each question of remaining carries **three** marks

1. Fill the following blanks with one word

   a) At resonance the admittance of the parallel RLC circuit is at its maximum and is equal to the conductance of the circuit **(State True/False)** (CO3)

   b) Laplace transform is useful for studying behaviour of a digital system **(State True/False)** (CO4)

   c) Constant K filter signal attenuation rate after the cut-off point is not very sharp **(State True/False)** (CO5)

   d) Parallel resonance occurs when the arrangement of components creates the largest impedance. **(State True/False)** (CO3)

2. State the conditions for series resonance (CO3)
3. Define the terms: i) initial conditions; ii) steady state; and iii) transient state (CO4)
4. Write the element model of inductor in time and S-domain. (CO4)
5. Define the terms: neper and decibel (CO5)

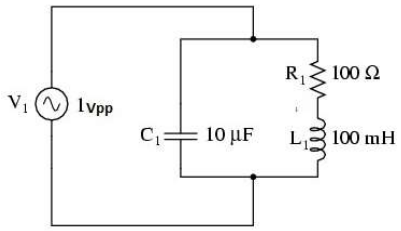
Part-B **3×8=24**

Instructions: (1) Answer **all** questions.
(2) Each question carries **eight** marks
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. (a) A series RLC circuit has a sinusoidal input voltage of 12 Vpeak to peak. If inductance, L= 20 MH, resistance, R = 80 Ω, and capacitance, C = 400 nF,find the (i) resonant frequency(ii) Inductive reactance and capacitive reactance at resonant frequency (iii) total current through the circuit at resonant frequency (CO3)

(or)

(b) Given the following parallel resonant circuit find the (i) resonant frequency (ii) Inductive reactance and capacitive reactance at resonant frequency (iii) branch currents at resonant frequency (CO3)



7. (a)Obtain the current expression in S-domain for RLC series circuit using Laplace transform (CO4)

(or)

(b) Obtain the current expression in S-domain for RC series circuit using Laplace transform (CO4)

8. (a)Explain T & π type attenuators with circuit diagram (CO5)

(or)

(b)Design a simple constant K Low Pass π filter with a cut-off frequency of 1KHz (CO5)

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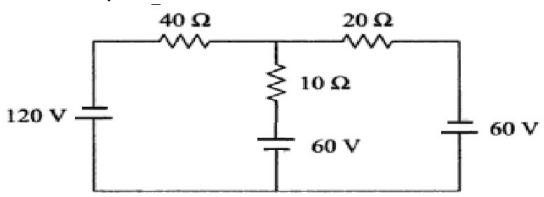
BOARD DIPLOMA EXAMINATIONS
C-23, EC-305, NETWORK ANALYSIS
III SEMESTER
MODEL PAPER - SEMESTER END EXAMINATION

TIME:3 HOURS **MAX MARKS:80**

Part-A **10×3=30**

Instructions: (1) Answer **all** questions.
(2) Each question carries **three** marks
(3) Answer should be brief and straight to the point and shall not exceed five simple sentences.

1. Define the terms: branch, node, and loop in circuits (CO1)
2. Write the mesh current equations for the network shown below (CO1)

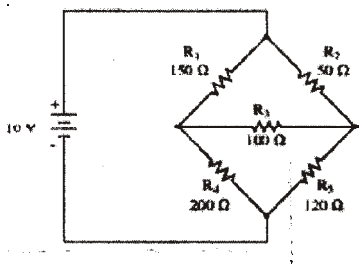


3. Give transformation formulas from Star to Delta (CO2)
4. State superposition theorem (CO2)
5. State the conditions for series resonance (CO3)
6. Compare Series and parallel resonance (CO3)
7. Define the terms: i) initial conditions; ii) steady state; and iii) transient state (CO4)
8. Write Laplace transforms for unit-step function and exponential function. (CO4)
9. List the disadvantages of constant K filters (CO5)
10. Define the terms: neper and decibel (CO5)

Part-B **5×10=50**

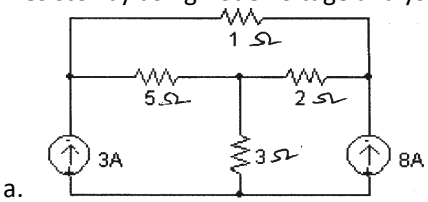
Instructions: (1) Answer **any five questions**.
(2) Each question carries **10** marks
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Solve for mesh currents using Cramer's rule for the given network below (CO1)

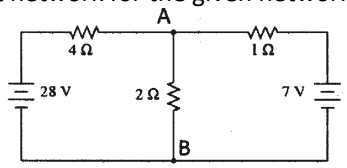


12. Find the voltage across 2-ohm resistor by using node voltage analysis (CO1)

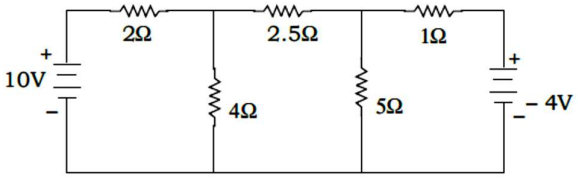
a.



13. Draw the Thevenin's equivalent network for the given network between A and B. (CO2)



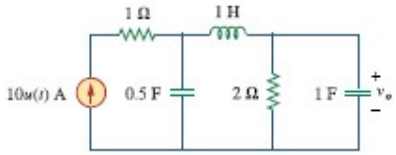
14. Find the current through 4-ohm resistor by using superposition theorem: (CO2)



15. A series RLC circuit has a sinusoidal input voltage of 12 Vpeak to peak. If inductance, L = 20 mH, resistance, R = 80 Ω, and capacitance, C = 400 nF, find the (i) resonant frequency(ii) Inductive reactance and capacitive reactance at resonant frequency (iii) total current through the circuit at resonant frequency (CO3)

16. Obtain the current expression in S-domain for RLC series circuit using Laplace transform (CO4)

17. Find the voltage $v_o(t)$ in the following circuit using Laplace transform



18. Explain T & π type attenuators with circuit diagram (CO5)

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