Candidate seat No: _____

CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY

B. Tech. (CE/CS/IT/EC) Sem-I Theory Examination

(February 2022)

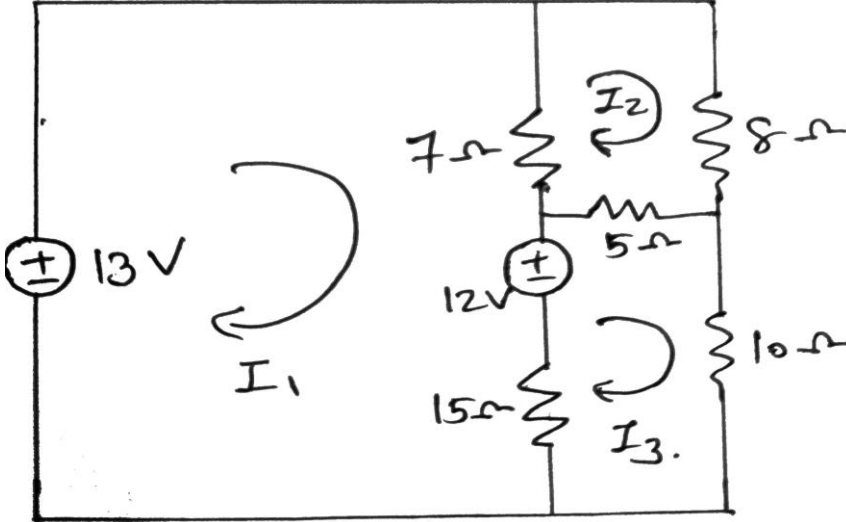**Course: EE 145 Basics of Electronics & Electrical Engineering**

Maximum Marks: 70

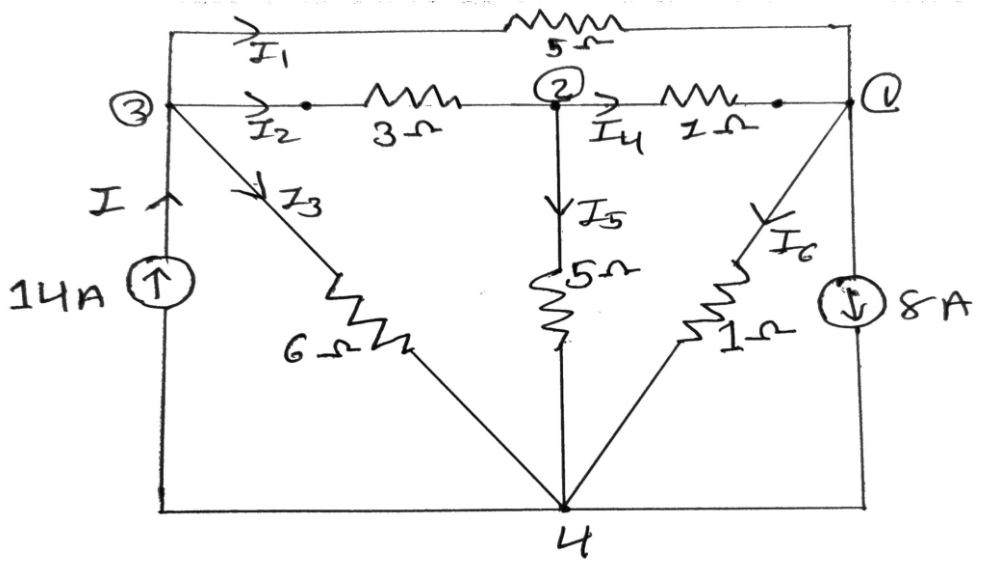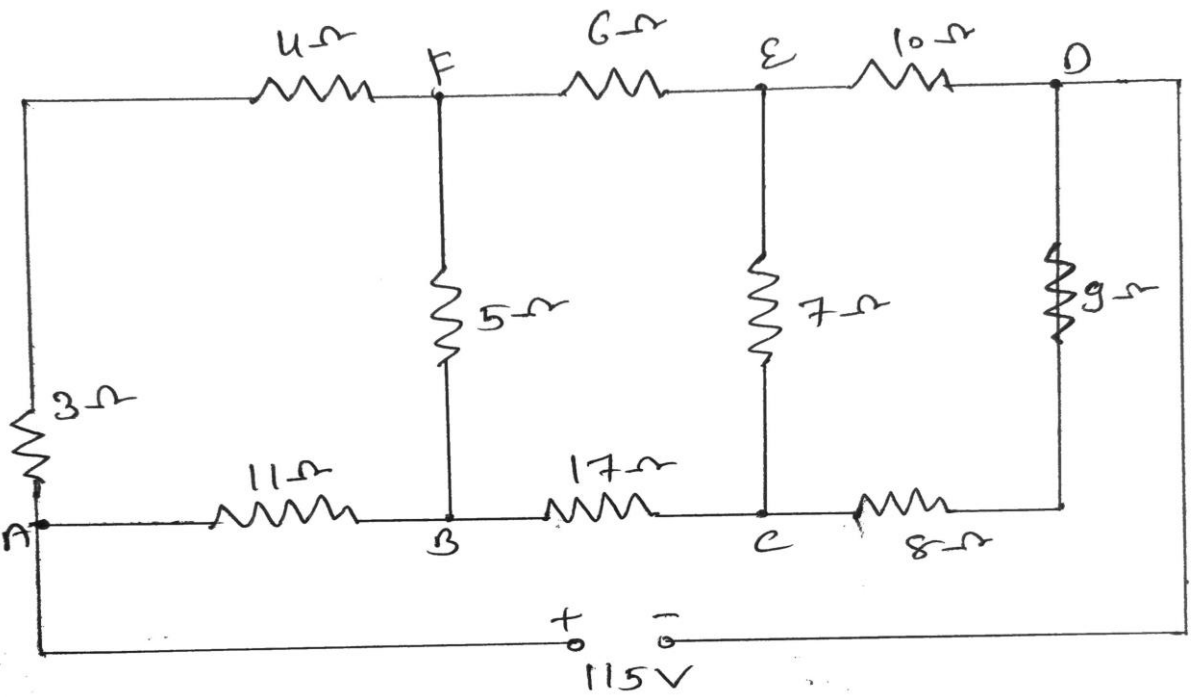**Date: 16/02/2022 (Wednesday)**   **Time: 10:00 a.m. to 01:00 p.m.**

Instructions:

(i) Attempt **all** the questions.

(ii) Figures to the right indicate **full** marks.

(iii) Make suitable assumptions and draw neat figures wherever if required.

(iv) Paper Uploading Time- 40 Minutes Extra for uploading the paper

Q-2	Answer the Following Questions. (Any Five)	[25]
A	A copper coil has a resistance of 25 ohm at 31 degree Celsius and 37 ohms at 55 degree Celsius, calculate:- 1). Temperature co-efficient of resistance at 0 degree Celsius 2). Resistance of coil at 0 degree Celsius 3). Temperature co-efficient of resistance at 85 degree Celsius 4). Resistance of coil at 60 degree Celsius	
B	Determine the mesh currents I1, I2 and I3 for the network shown in **fig a**. by using KVL. **fig a.**	

C	Using nodal analysis calculate the currents in the various resistors of the circuit shown in **fig b.** **fig b.**
D	A parallel plate capacitor has plates of area 5 m^2 spaced by the three slabs of different dielectrics. The relative permittivity are 4, 7 and 11 and the thickness 0.8, 1.3 and 1.7 mm respectively. Calculate the combined capacitance and the dielectric stress in each material. When the applied voltage is 970 V.
E	An alternating emf is represented by e=141.4*sin 377t Calculate (i) Maximum value (ii) Frequency (iii) Time period (iv) Instantaneous value of voltage when t is 3 milliseconds.
F	A series LC circuit has and inductance of 200µH, A Capacitance of 300pF and Q of 60. Determine i) Resonance frequency ii). Bandwidth iii). Upper and lower cut-off frequency

G	Determine the current in the 17 Ω resistor in the network shown in **fig c**. using the delta-star transformation. **fig c**	
Q-3	**Answer the Following Questions. (Any Five)**	**[25]**
A	Give the definition 1. Potential difference 2. Active & passive element 3. Loop & Mesh 4. Conductance & conductivity 5. Electrical energy	
B	Explain and derive the charging equation of capacitor voltage with necessary diagrams.	
C	Derive the equation of resistance for star to delta transformation.	
D	Comparison between electric and magnetic circuit. (Minimum 10 points)	
E	Explain basic principle of Generation of Alternating voltage and derive equation of alternating Voltage e= Em Sin ωt for single phase circuit.	
F	Explain series R-L circuit with phasors diagram and waveform. Also explain power factor, active power, reactive power, apparent power.	
G	Explain in detail the Voltage and current relation in 3-phase delta connected system.	
H	Explain common emitter connection with current amplification factor and expression for output current and also explain Input and output characteristics of Common Emitter connection.	

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