MID-TERM EXAMINATION

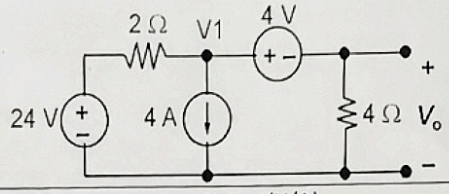
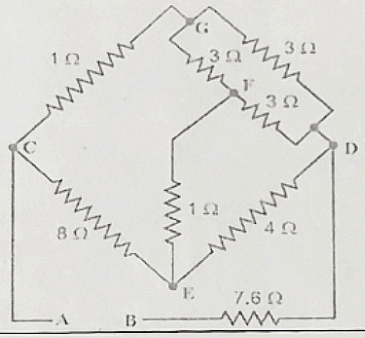
(Course Name: B. Tech.) (Semester: 1st)

(October 2024) OFF LINE mode

Subject Code: BEC-101	Subject: : Basic Electrical Engineering
Time : 1 ½Hours	Maximum Marks :30

Note: Q1 is compulsory. Attempt any two parts of Q2 and Q3

Scientific calculators are allowed for solving the questions.

Q1		(2.5*4=10)	CO Mapping
a)	Explain Thévenin's theorem utilizing nulling effect with relevant example.		CO_1
b)	Differentiate between Q-factor and power factor of a series resonant circuit with relevant equations.		CO_2
c)	The equation of an alternating current i is $i=42.42\ sin628t$. Find (i) form factor (ii) frequency.		CO_2
d)	Explain Reciprocity theorem.		CO_1
	UNIT I		**CO Mapping**
Q2	**Attempt any two parts**	**(5*2=10)**	CO_1
a)	State and prove Superposition theorem with example.		
b)	State Power transfer theorem. Determine V_O and P_{MAX} of the circuit shown below: 		
c)	Determine Star to delta (Y/Δ) conversions. Using (Y/Δ) conversions, find the equivalent resistance across A and B in following figure: 		
	UNIT II		**CO Mapping**
Q3	**Attempt any two parts**	**(5*2=10)**	CO_2
a)	A 120V, 60W lamp is to be operated on 220V, 50Hz supply mains. Calculate non-inductive resistance and pure inductance in order that lamp is run on correct voltage.		
b)	Explain R-L-C Series circuit with phasor diagram.		
c)	A coil of resistance 15Ω & Inductance 0.05H is connected in parallel with a non-Inductive resistance of 20Ω. Design the respective circuit and find (i) current in each branch (ii) Total current (iii) Phase angle when a combination has applied a voltage of 200V at 50Hz (iv)Total power consumed.		