Reg. No.															

Question Paper Code	13661

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

First Semester

Computer Science and Business Systems

20ESEE105 - PRINCIPLES OF ELECTRICAL ENGINEERING

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	_____ is a passive element in an electric circuit (a) Resistor (b) Transistor (c) Voltage source (d) Operational amplifier	1	K1	CO1
2.	Power in an electrical circuit is defined as: (a) V × I (b) V / I (c) I × R (d) V × R	1	K1	CO1
3.	According to Thevenin's Theorem, any linear electric network can be replaced by: (a) A current source in parallel with a R (b) A voltage source in series with a R (c) A current source in series with a R (d) A voltage source in parallel with a R	1	K1	CO2
4.	In Maximum Power Transfer Theorem, maximum power is transferred to the load when the load resistance: (a) Is half the R_s (b) equals the R_s (c) Is double the R_s (d) Is zero	1	K1	CO2
5.	In a 3-phase balanced AC circuit, the phase difference between any two line voltages is: (a) 0° (b) 90° (c) 120° (d) 180°	1	K1	CO3
6.	The form factor of a sinusoidal AC waveform _____ (a) 1.0 (b) 1.414 (c) 1.11 (d) 0.707	1	K1	CO3
7.	Ampere's Law states that the magnetic field in space around an electric current is: (a) Directly proportional to the I passing through the wire (b) Inversely proportional to the I passing through the wire (c) Independent of the I (d) Directly proportional to the resistance of the wire	1	K1	CO4
8.	The electric field strength (E) is defined as: (a) The force experienced by a unit charge (b) The work done per unit charge (c) The rate of change of potential difference (d) The charge stored per unit area	1	K1	CO4
9.	_____ is a basic safety device used in electrical wiring to protect against over current (a) Transformer (b) Fuse (c) Resistor (d) Relay	1	K1	CO5
10.	Which device is used to measure single-phase power in an AC circuit? (a) Wattmeter (b) Voltmeter (c) Ammeter (d) Ohmmeter	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	What is electric current?	2	K1	CO1
12.	Compare between active and passive elements of electric circuit.	2	K2	CO1
13.	Define Electric Potential.	2	K1	CO1
14.	Write the steps to convert star to delta network.	2	K1	CO2
15.	List the steps to find Thevenin's voltage.	2	K1	CO2
16.	What are the conditions for maximum power transfer in DC and AC circuits?	2	K1	CO2
17.	What is RLC circuit?	2	K1	CO3
18.	Compare true power and apparent power.	2	K2	CO3
19.	List the properties of magnetic line of force.	2	K1	CO4
20.	Summarize about electromechanical energy conversion.	2	K2	CO4

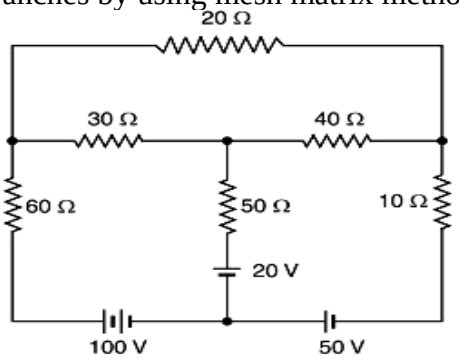
21. How does a thermocouple works? 2 K1 CO5

22. What is the necessity of earthing? 2 K1 CO5

PART - C (6 × 11 = 66 Marks)

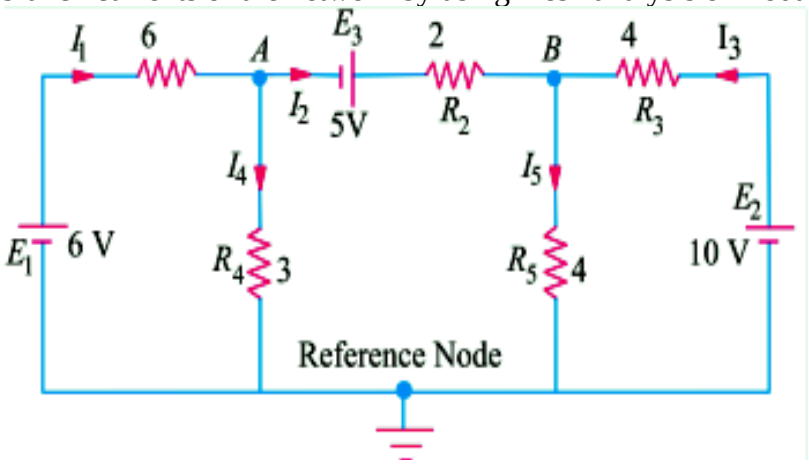
Answer ALL Questions

23. a) Infer the current in all branches by using mesh matrix method. 11 K2 CO1

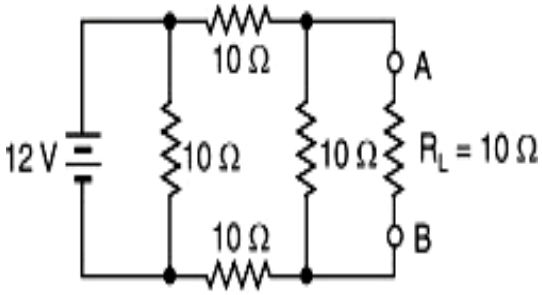


OR

b) Show the branch currents of the network by using mesh analysis or Nodal analysis. 11 K2 CO1

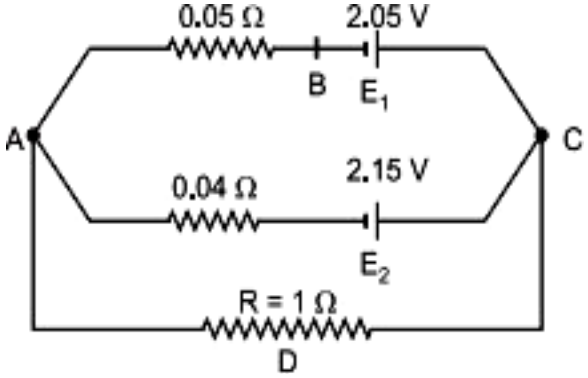


24. a) Make use of Norton's equivalent circuit and solve for load voltage and load current. 11 K3 CO2



OR

b) Identify the current in the R =1 ohm by superposition theorem. 11 K3 CO2



25.	a)	Explain the operation of AC circuit containing R only with equations for phase angle, phasor diagram, power and also draw the power curve.	*11*	*K2*	*CO3*
		OR			
	b)	A Coil having a resistance of 7ohm and an inductance of 31.8 mH is connected in 230 V, 50 Hz. Interpret (i) Circuit current (ii) Phase angle (iii) Power factor (iv) Power consumed and (v) Voltage drop across resistor and inductor.	*11*	*K2*	*CO3*
26.	a)	Explain about electric field and electric intensity.	*11*	*K2*	*CO4*
		OR			
	b)	Outline about the charging of capacitor with neat diagram.	*11*	*K2*	*CO4*
27.	a)	Explain the construction and working principle of single phase wattmeter.	*11*	*K2*	*CO5*
		OR			
	b)	Illustrate the working of thermocouple with a functional block diagram.	*11*	*K2*	*CO5*
28.	a) (i)	Classify the types of transformer with neat diagram.	*6*	*K2*	*CO4*
	(ii)	Explain the working and principle of PMMC.	*5*	*K2*	*CO5*
		OR			
	b) (i)	Summarize the transformation ratio of the transformer.	*6*	*K2*	*CO4*
	(ii)	Explain the working of Moving Iron Instrument.	*5*	*K2*	*CO5*