Date: 25-12-2023

Total Number of Pages: [2]

Total Number of Questions: [6]

Course Title:Fundamental of Electrical Engineering

Course Code:EEL 1006

Time Allowed: 3 Hours

Max Marks: [50]

Instructions : NOTE

i. Support your answer with neat freehand sketches/diagrams, wherever appropriate.
ii. Assume an appropriate data / information, wherever necessary / missing.
iii. **Attempt 5 questions and question 1 is compulsory**

Section - A

Q1 **First question consist of 10 parts each carry 1 marks.** (10)

(1.1) In an ac circuit, the ratio of kW/kVA represents .....

(1.2) An RL circuit has z=(6+j8) ohm. Its suseptance is

(a) 0.06 (b) 0.08 (c) 0.1 (d)-0.08

(1.3) Thevenin resistance rth is found by;

(a) between any two open terminal

(b)by short circuiting the given two terminal

(c)by removing voltage sources along with their internal resistance

(d) between same open terminal as for vth

(1.4) For ideal transformer the winding should have

(a) maximum resistance on primary side and least resistance on secondary side

(b)least resistance on primary side and maximum resistance on secondary side

(c) equal resistance on primary and secondary side

(d) no ohmic resistance on either side

(1.5) Real part of admittance is ..... and the imaginary part is.....

(a) R and X (b) B and G (c) R and G (d) B and X

(1.6) The commutator of a dc motor serves the purpose of

(a) changing ac to dc (b) converting dc into ac

(c) reduce friction (d) avoiding arc at the brushes

(1.7) Unit of inductive reactance is

(a) henry (b) milihenry (c) Wb (d)ohm

(1.8) Which of the following is active element

(a) resistance (b) current source (c) voltage source

(1.9) The circuit having same properties in either direction

(a)bilateral (b) unilateral (c) irreversible (d) reversible

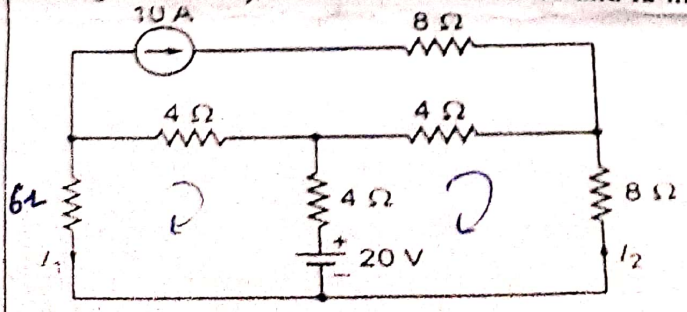
(1.10) Two resistors R1 and R2 give combined resistance of 4.5 ohm when in series and 1 ohm when in parallel, the resistance are

(a) 2 ohm and 2.5 ohm (b) 1 ohm and 3.5 ohm

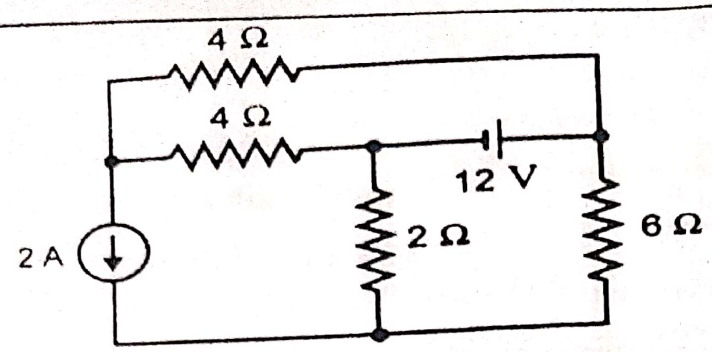
(c) 1.5 ohm and 3 ohm (d) 4 ohm and 0.5 ohm

Section - B

Q2. Using mesh analysis calculate currents I1 and I2 in figure (4)



(b) Using Thevenin theorem, find the Vth, Rth , Current flowing through 6 ohm resistor and also draw Thevenin equivalent circuit. (6)

		
Q3.	(a)With phasor diagram and waveform show the behavior of AC through RL circuit. Also obtain the expression for instantaneous power and average power. (b)Define Active power, reactive power, apparent power and power factor **OR** Explain the working principle of a dynamometer type wattmeter. A dynamometer type wattmeter with its voltage coil connected across the load side of the instrument reads 200 w. If the load voltage be 200 V, what power is being taken by load? The voltage coil branch has a resistance of 2000 ohm.	(6) (4) (10)
Q4	(a) What do you mean by three phase supply and what are its advantages over single phase supply, also differentiate between line voltage and phase voltage in 3 phase circuits. (b)For the star connection with help of phasor diagram, show the relation between (1) line voltage and phase current. (2) line current and phase current **OR** Explain the working principle of three phase slip ring induction motor using electrical equivalent circuit or otherwise. Does magnetic field produced keeps rotating? Support your answer with reasons.	(5) (5) (10)
Q5	(a)Explain the construction and working of transformer. Also derive the emf equation for the transformer. (b)What are the assumptions for ideal transformer. With the help of phasor diagram show the behavior ideal transformer for R load.	(6) (4)
Q6.	(a)With the help of diagram explain the construction and working of DC generator. (b)What is back emf in dc motor, derive the expression for emf generator in dc generator. **OR** Write short notes on the following **(any two)** **(1)** Hysteresis and eddy current losses. **(2)** Synchronous machines **(3)** PMMC (4) B-H Curve	(5) (5) (10)

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA

School of Electrical Engineering

B. Tech. (Branch) Minor I Examination (Odd) 2023-24

Entry No: | | | | | | | | | |

Date:

Total Number of Pages: [02]

Total Number of Questions: [06]

Course Title: Fundamental of Electrical Engineering

Course Code: EEL 1006

Time Allowed: 1 Hours **Max Marks: [20]**

Instructions / NOTE

i. Attempt All Questions.

ii Support your answer with neat freehand sketches/diagrams, wherever appropriate.

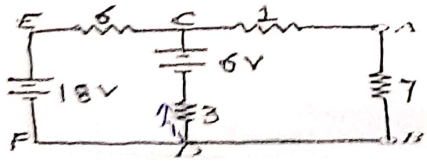
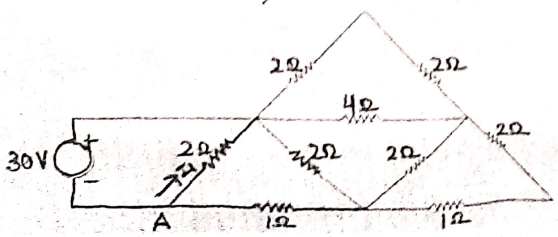
iii. Assume an appropriate data / information, wherever necessary / missing.

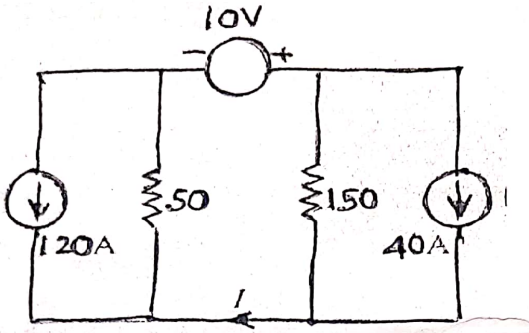
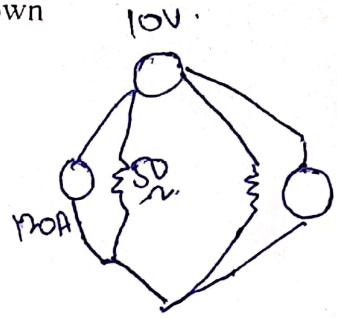
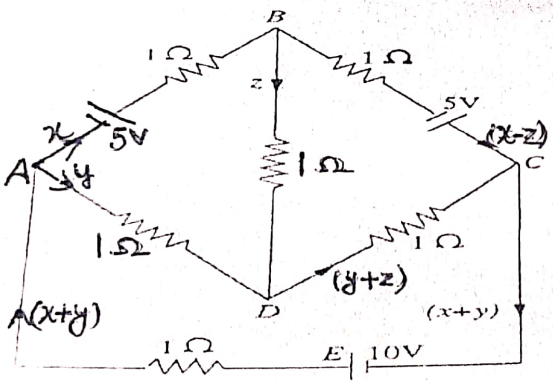
Section – A

Q1.	(1.1)A network consists of linear resistors and ideal voltage source. If the value of resistors are doubled, the voltage across each resistor is (a) halved (b) doubled (c)increased 4 times (d) not changed (1.2)Ideal current source have (a) zero internal resistance (b) infinite internal resistance (c)low value of voltage (d) large value of current (1.3) Two resistors of 12 ohm , 4 ohm are connected in series . a short is placed across the combination . the effective resistance will be…….. (1.4) Three resistances each of R ohm are corrected to form triangle. The resistance between any two terminals will be (a) R ohm (b) 3/2 R ohm (c) 3 R ohm (d) 2/3 R ohm (1.5) How are 500 ohm resistors connected so as to give an effective resistance of 750 ohm. (a) three resistors of 500 ohm each, in parallel (b) three resistors of 500 ohm each, in series (c) two resistors of 500 ohm each, in parallel (d) two resistors of 500 ohm each, in parallel and combination in series with another 500 ohm resistors.	[05]	[CO1]

Section – B

Attempt any three questions

Q2.	Derive the expression for maximum power transfer theorem. Also explain the different types of voltage and current sources OR State kirchoff's laws and explain them with suitable example.	[05]	[CO1]
Q3.	Use thevenin theorem to find the current through 7 ohm  Or Determine the current by the source in the circuit shown below, also find current I1  	[05]	[CO1]

Q4.	A bridge network ABCD has arms AB, BC, CD, DA of resistance 1,1,2 and 1 ohm respectively. If detector AC has a resistance of 1 ohm, determine by star / delta transformation , the network resistance as viewed from battery terminals.	[5]
Q5.	Use superposition theorem to find current I in the circuit shown   OR Determine the branch current in the network when value of each branch resistance is one ohm  	[5]
Q6.	Write short note: (1) faradays law of electromagnetic induction (2) law of conservation of energy	

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Electrical Engineering
B. Tech. (Branch) Minor2 Examination (Odd) 2023-24

Entry No: | | | | | | | | | |

Total Number of Pages: [01]

Date: 22 nov 2023

Total Number of Questions: [04]

Course Title: Fundamental of Electrical Engineering

Course Code: EEL 1006

Time Allowed: 1 Hours

Max Marks: [20]

Instructions / NOTE

i. Attempt All Questions.
ii. Support your answer with neat freehand sketches/diagrams, wherever appropriate.
iii. Assume an appropriate data / information, wherever necessary / missing.

	Section – A		
Q1	First question consist of fill ups and Mcqs carrying one mark each. (1.1)Superposition theorem can be applied only to circuits having .....elements (a) non linear (b) passive (c)linear bilateral (d) resistive (1.2) while calculating rth , constant current sources in circuit is replaced by..... (1.3)Nodal analysis is based on application of ..... (1.4) the phase angle of series RLC circuit is leading when (a) XL =0 (b) R=0 (c) Xc greater than XL (d) Xc is less than XL (1.5) Power factor of an ac circuit is equal to.....	[05]	[CO1]
	Section – B		
Q2.	(a)With the help of phasor diagram and waveform of (v,I, p). Explain the behaviour of AC through R circuit. Also find the expression of instantaneous power. (b)in a given RL circuit , R =3.5 ohm and L=0.1 H. Find (i) the current through circuit (ii) power factor. if a 50 Hz voltage V=220 angle 30 degree is applied across the circuit.	[03] [02]	[CO1]
Q3.	A series circuit has R=10ohm, L=50mH and C=100microfarad and is supplied with 200V, 50 Hz. Find (a) impedence (c) current (d) power (e)power factor (f) voltage drop across each element .	[05]	[CO1]
Q4.	Write short note on any two: (a) Power triangle (b)Generation of AC (c) power factor	[5]	[CO1]

Date: 20 Dec. 2024 — Number of Pages: [02]

Total Number of Questions: [04]

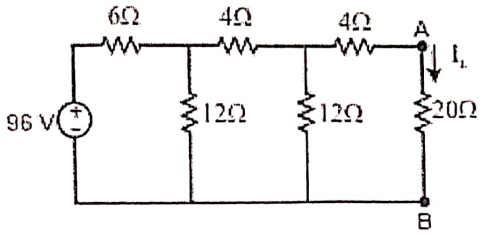
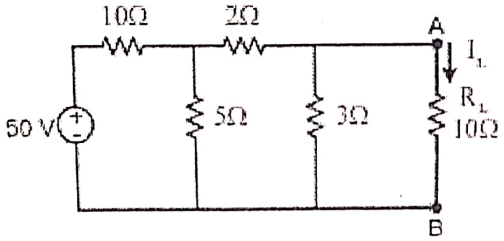
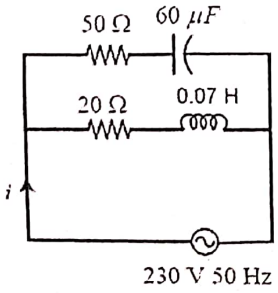
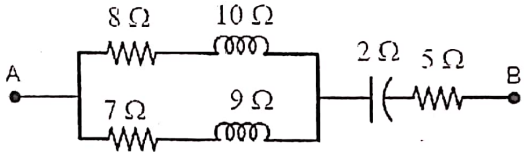
Course Title: Fundamentals of Electrical Engineering

Course Code: EEL ES101

Time Allowed: 3 Hour — **Max Marks: [50]**

NOTE (i) Make assumptions properly (if required)

(ii) Question 5 has a choice (any one is to be attempted)

Q1.	(a) Find the Thevenin and Norton equivalent circuit with a diagram, and find the current I_l for the circuit shown in the Figure 1 with respect terminals A-B.	[05]	CO3
	Figure 1 		
	(b) Determine the current I_l in branch A-B in Figure 2. Then using the maximum power transfer theorem again find the current in branch A-B to find the difference.	[05]	CO3
	Figure 2 		
Q2.	(a) An alternating current carrying sinusoidally with a frequency of 50 Hz has a maximum value of 100 A. Determine: i. the instantaneous value of current after 1/300 sec . ii. the time taken for the current to reach 80 A for	[05]	CO4
	(b) Three alternating currents i1 = 141sin(ωt + π/4), i2 = 30sin(ωt + π/2), and i3 = 20sin(ωt-π/6) are fed into common conductor. Find the equation for the resultant current, its rms value, form factor, and peak factor.	[05]	CO4
Q3.	(a) Two parallel circuits in Figure 3, comprising of (i) a coil of resistance of 20 and inductance of 0.07 H and (ii) a resistance of 50 in series with a condenser of capacitance 60 μF are connected across 230 V, 50 Hz. Calculate the main current and power factor of the arrangement.	[05]	CO4
	 **Figure 3**  **Figure 4**		
	(b) In the arrangement shown in the Figure 4. Calculate the impedance between AB and the phase angle between voltage and current. Also calculate the total power consumed, if the applied voltage between AB is $200\angle 30^{\circ}$	[05]	CO4
Q4.	An alternating voltage of (160+j120) V is applied to a circuit and the current is given by (6+j8)A. Find the values of circuit elements by assuming f=50Hz. Calculate the power factor of the circuit and power consumed by the circuit.	[05]	CO4

Q5.	Given V = 200sin377 volts and i = 8sin(377t+30°) Amps for an AC circuit, determine (i) the power factor (ii)True power (iii) Apparent power (iv) Reactive power indicate the unit of the power calculated. **OR** A coil of resistance R=20 Ω and inductance L=0.2 H is connected in series with a capacitance across 230 V supply Find (a) the value of the capacitance for which resonance occurs at 100 Hz frequency (b) the current through and voltage across the capacitor (c) Q factor of the coil	[05

Course Outcomes:

1. Understanding of the basics of electrical engineering
2. The ability to analyse the AC and DC electrical circuits
3. The ability to apply simplified methods such as electrical circuit theorems for circuit analysis
4. The ability to apply different methods for AC electrical circuit analysis for solving the design problems
5. Understanding of the resonance in electrical circuits and its significance.

CO	Questions Mapping	Total Marks	Total Number of Students (to be appeared in Exam)
CO3	1	10	31 + 78 (ECE, CE)
CO4	2, 3, 4	25	31 + 78 (ECE, CE)
CO5	5	5	31+ 78 (ECE, CE)

SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Electrical Engineering
B. Tech. (I – CE/ECE) Midterm Examination (ODD) 2024-25

Entry No: 24BEC065

Date: 10th Oct. 2024

Total Number of Pages: [01]

Total Number of Questions: [04]

Course Title: Fundamentals of Electrical Engineering

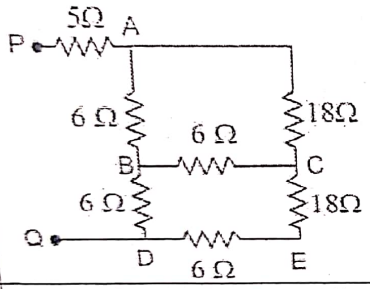
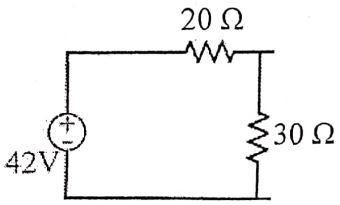
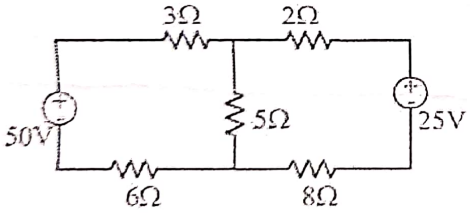
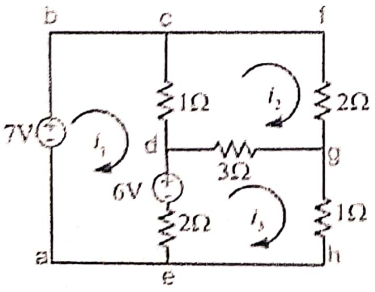
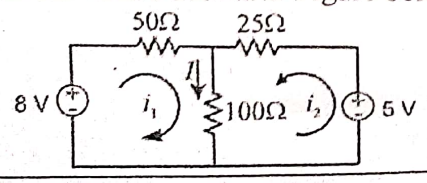
Course Code: EEL ES101

Time Allowed: 1.5 Hours

Max Marks: [20]

Instructions / NOTE (Faculty may include any other relevant instruction, if required)

i. Attempt All Questions.
ii. Support your answer with neat freehand sketches/diagrams, wherever appropriate.
iii. Assume an appropriate data / information, wherever necessary / missing.

	Section - A		
Q1.	(i) Determine the equivalent resistance between terminals PQ using star-delta method  (ii) Determine the voltages across 20 Ω and 30 Ω resistors 	[04] [01]	CO1
Q2.	In the circuit shown in Figure below, determine all branch currents and the voltage across the 5 Ω resistor by node analysis. 	[05]	CO2
Q3.	In the circuit shown in Figure below, determine the mesh currents i_1; i_2; i_3. 	[05]	CO2
Q4.	In the circuit shown in Figure below, using superposition theorem find the current I 	[05]	CO3

Course Outcomes

Instructions / NOTE

i. Attempt All Questions.
ii. Support your answer with neat freehand sketches/diagrams, wherever appropriate.
iii. Assume an appropriate data / information, wherever necessary / missing.

Section – A

Q1. **(1.1)**A network consists of linear resistors and ideal voltage source. If the value of resistors are doubled, the voltage across each resistor is
(a) halved (b) doubled (c)increased 4 times (d) not changed
(1.2) Ideal current source have
(a) zero internal resistance (b) infinite internal resistance (c)low value of voltage (d) large value of current
(1.3) Two resistors of 12 ohm , 4 ohm are connected in series . a short is placed across the combination . the effective resistance will be....1.6.....
(1.4) Three resistances each of R ohm are corrected to form triangle. The resistance between any two terminals will be
(a) R ohm (b) 3/2 R ohm (c) 3 R ohm (d) 2/3 R ohm
(1.5) How are 500 ohm resistors connected so as to give an effective resistance of 750 ohm.
(a) three resistors of 500 ohm each, in parallel
(b) three resistors of 500 ohm each, in series
(c) two resistors of 500 ohm each, in parallel
(d) two resistors of 500 ohm each, in parallel and combination in series with another 500 ohm resistors.

Section – B

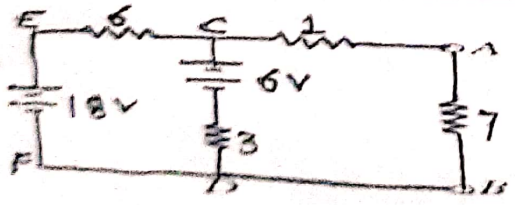
Attempt any three questions

Q2. Derive the expression for maximum power transfer theorem. Also explain the different types of voltage and current sources [0

OR

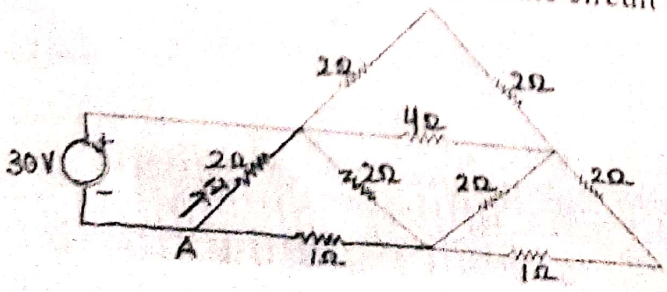
State kirchoff's laws and explain them with suitable example.

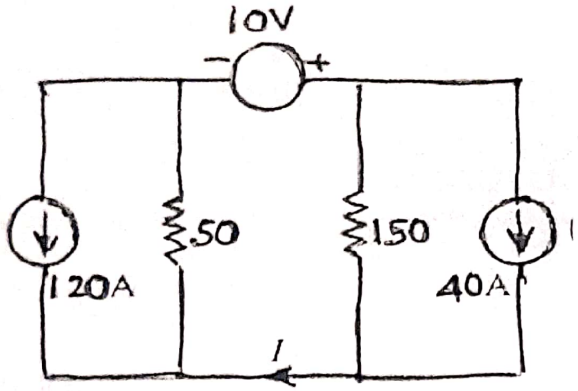
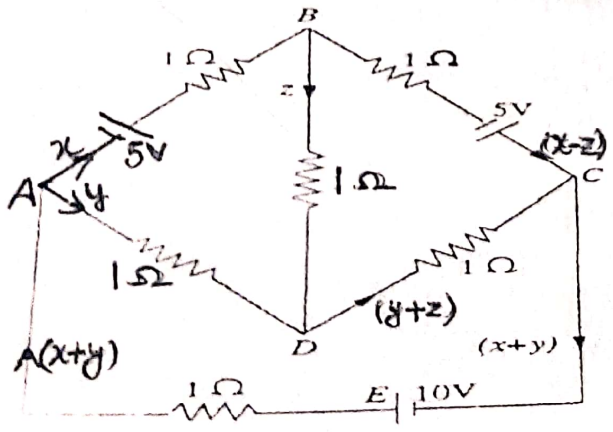
Q3. Use thevenin theorem to find the current through 7 ohm [0



Or

Determine the current by the source in the circuit shown below, also find current I1



Q4.	A bridge network ABCD has arms AB, BC, CD, DA of resistance 1,1,2 and 1 ohm respectively. If detector AC has a resistance of 1 ohm, determine by star / delta transformation , the network resistance as viewed from battery terminals.
Q5.	Use superposition theorem to find current I in the circuit shown  OR Determine the branch current in the network when value of each branch resistance is one ohm 
Q6.	Write short note: (1) faradays law of electromagnetic induction (2) law of conservation of energy