Printed Page 2

Uni. Roll No.....

B. Tech. I Year, I Semester, Ist Term Examination, 2016-17

EEE-1001: Electrical Engineering

Time: 01 ½ Hours **Total Marks: 20**

Section-A

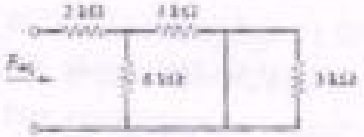
Note: Attempt All Questions. **[1x5=5 Marks]**

(I). Two sinusoidal currents are given by $i_1 = 10\sin(wt+\pi/3)$ and $i_2 = 15\sin(wt-\pi/4)$. Calculate the phase difference between them in degrees.

(II) A voltage wave is represented by $v(t) = 300\sin 314t$. Determine instantaneous value of voltage at 0.05 sec.

(III) Draw the power triangle indicating different types of powers.

(IV) Find the value of R_{eq} in Fig.1



(Fig. 1)

(V). The current through a branch in a linear network is 2 A when the input source voltage is 10 V. If the voltage is reduced to 1V and the polarity is reversed, find the current through the branch.

Section-B

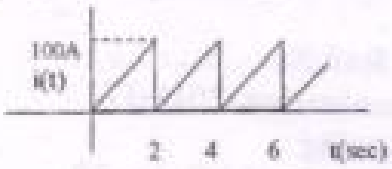
Note: Attempt Any Three Questions. **[2x3 = 6 Marks]**

(I). State the maximum power transfer theorem and determine the condition for which maximum power is transferred from source to load.

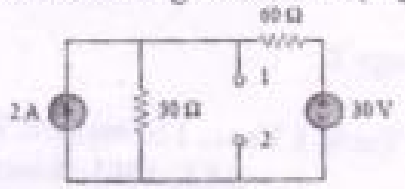
(II). Two voltages given by $V1 = 50\sqrt{2}\cos(377t - 30^\circ)$, $V2 = 20\sqrt{2}\sin(377t + 45^\circ)$ act in the series circuit. Determine (a) frequency of the total voltage and (b) rms value of the resultant voltage.

P.T.O.

(III).Find the average and rms values of the following waveform (Fig. 2):



(Fig. 2)



(Fig-3)

(IV). Find the Thevenin equivalent circuit across 1-2 terminals in Fig 3 shown above:

Section-C

Note: Attempt Any Three Questions. **[3x3=9 Marks]**

(I) Explain Superposition theorem with the help of a suitable example. Also explain linearity property in case of DC circuits.

(II). A coil of resistance 20 Ω, inductance 0.2 H is connected in series with a capacitor of 150μF across 230V,50 Hz supply. Calculate:

a) Impedance b) current c) magnitude and nature of power factor.

(III) Explain the following with the help of phasor diagram & necessary equations:

a) Disadvantage of low power factor

b) power factor correction

(IV) Using Node analysis, find the value of V_1 & V_2 in Fig 4.

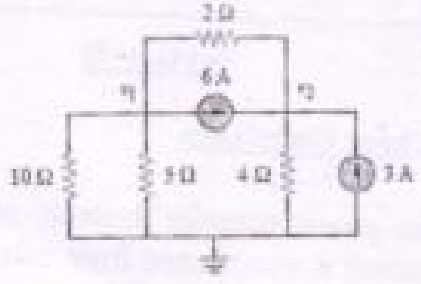


Fig-4

B.Tech, I Year II semester, First Term Examination, 2016-17

EEE-1001: Electrical Engineering

Time: $1\frac{1}{2}$ Hours **Total marks: 20**

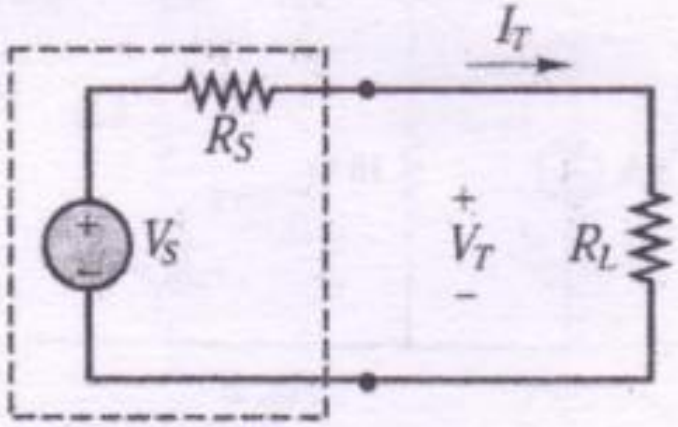
Notes:

1. Answer should be brief and to the point and be supplemented with neat sketches wherever necessary.
2. Any missing data may be assumed suitably with proper justification.
3. All symbols, abbreviation have their usual meaning.

SECTION A

Attempt all questions (1x5=5)

I. In the circuit shown in figure 1, determine the terminal voltage of the source, where $V_S = 12$ V, $R_S = 5\Omega$, $R_L = 7\Omega$.



Non-Ideal Source

Fig. 1

II. Differentiate between unilateral and bilateral elements, give example in each case?

III. Suggest a method to improve poor power factor in an electrical circuit?

IV. Write units of active power and reactive power?

V. Why knowledge of effective value in a sinusoid is more useful than its maximum value?

SECTION B

Attempt any three questions (2x3=6)

I. The instantaneous values of two alternating currents are given below,

$$i_1(t) = 10\sqrt{2}sin(314t - \frac{\pi}{3})$$

$$i_2(t) = 5\sqrt{2}sin(314t + \frac{\pi}{6})$$

a) Write the time expression for $i(t) = i_1(t) + i_2(t)$ and also calculate the frequency of $i(t)$.

b) Find the effective value of $i(t)$ and draw the phasor diagram showing all the currents.

II. State Thevenin's theorem. Evaluate R_{th} and V_{th} for the circuit shown in figure 2.

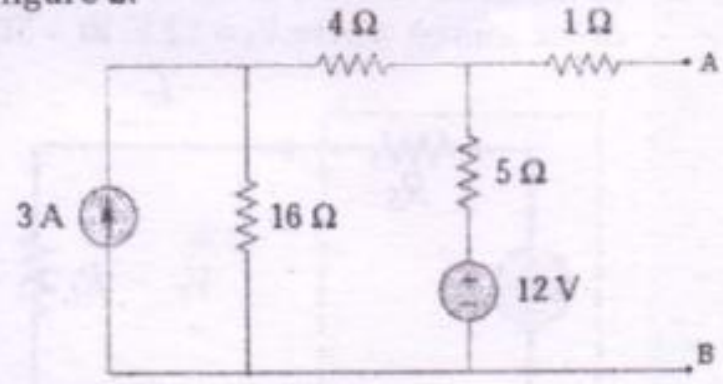


Fig. 2

III. (a) Can we use superposition theorem in power calculation, justify your answer.

(b) Explain Ideal voltage source and practical voltage source.

IV. Determine the rms value of the voltage waveform shown in Figure 3, If this waveform is given to a 5Ω resistor, find the average power absorbed by the resistor.

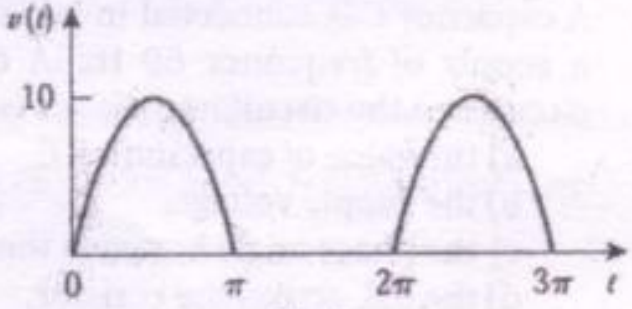


Fig. 3

SECTION C

Attempt any three questions (3x3=9)

I. Using nodal analysis, calculate v_o in the circuit of figure 4.

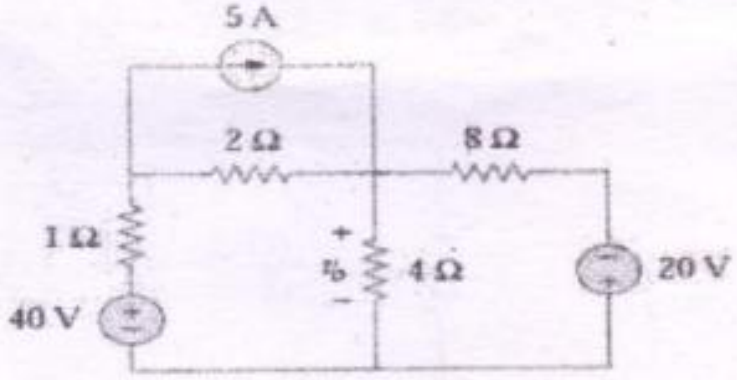


Fig. 4

II. (a) What do you mean by form factor and peak factor?
(b) What is the difference between loop and mesh?
(c) Explain Kirchhoff's laws?

III. State and proof maximum power transfer theorem in a dc circuit also calculate efficiency at maximum power transfer.

IV. A capacitor C is connected in series with a 40Ω resistor across a supply of frequency 60 Hz. A current of 3 A flows in the circuit and the circuit impedance is 50 Ω. Calculate:

a) the value of capacitance, C,
b) the supply voltage,
c) the phase angle between the supply voltage and current,
d) the p.d. across the resistor,
e) the p.d. across the capacitor,
f) draw the phasor diagram.

Printed pages:3 University Roll no.....

First Term Examination
Odd- Semester, 2017-18
B.Tech, I Year
Electrical Engineering, EEE-1001

Time: 1 Hours **Total marks: 15**

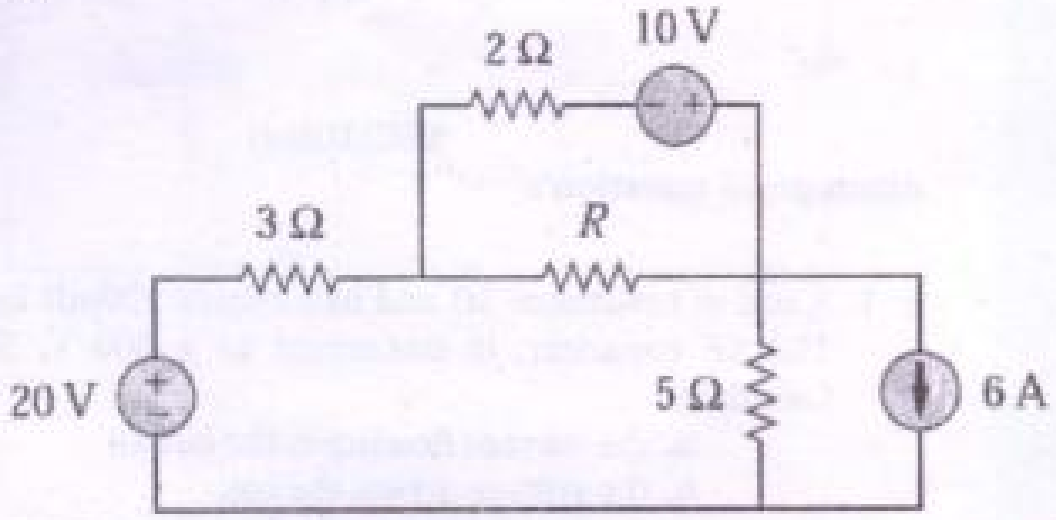
Notes:

1. Answer should be brief and to the point and be supplemented with neat sketches wherever necessary.
2. Any missing data may be assumed suitably with proper justification.
3. All symbols, abbreviation have their usual meaning.

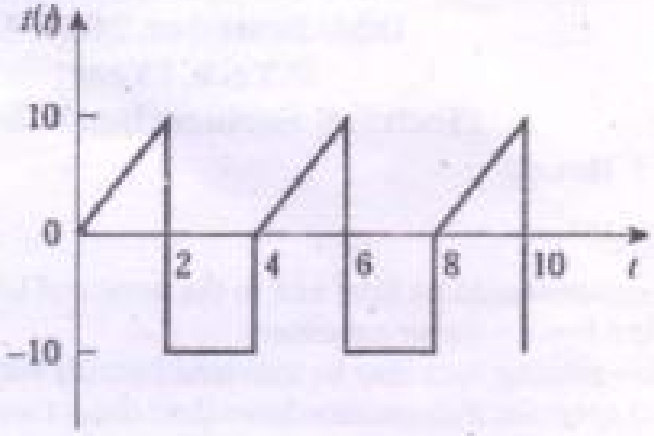
SECTION-A

Attempt all question's **[2x3=6]**

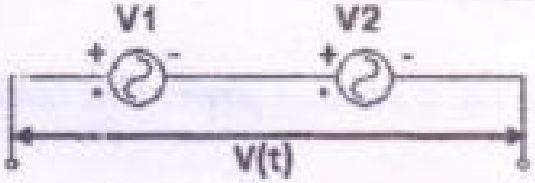
1. Find the maximum power that can be delivered to the resistor R?



2. Determine the rms value of the current waveform in Fig. If the current is passed through a 2Ω resistor, find the average power absorbed by the resistor.



3. For the given figure, $V_1(t) = 10\cos(50t - \pi/3)$ and $V_2(t) = 12\cos(50t - 30^o)$. Write the time expression for $V(t)$, also draw phasor diagram for V_1, V_2 and $V(t)$.



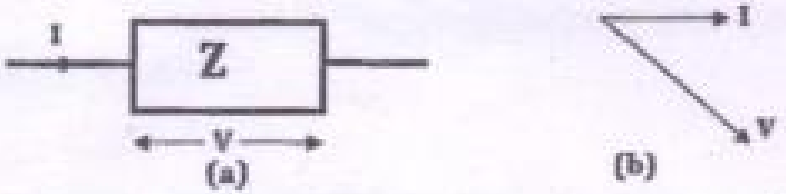
SECTION-B

Attempt all question's **[3x3=9]**

1. A coil of resistance 5Ω and inductance 120mH in series with a 100 μF capacitor, is connected to a 300 V, 50 Hz supply. Calculate
   a. the current flowing in the circuit
   b. the voltage across the coil
   c. the voltage across the capacitor
   d. the phase difference between the supply voltage and current

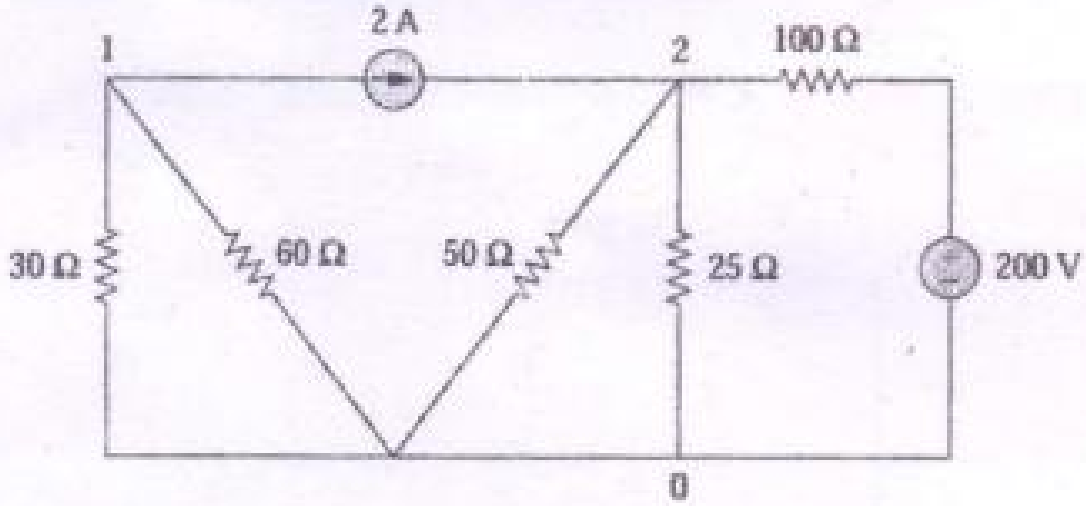
2. a. What do you mean by linear and non-linear elements, give suitable example in each case?

b. In the given figure impedance Z is composed of only two elements out of R, L, C. Phasor diagram for the impedance is given in figure (b), Identify the elements present in Z.



c. What do you mean by practical voltage source, draw its equivalent circuit and i-v characterstic?

3. For the given circuit calculate the node voltages V_1 and V_2 using nodal analysis.



Printed pages:2 University Roll no.....

First Term Examination
B.Tech, I Year, odd semester, 2018-19
Basic Electrical Engineering: BEEG-0001

Time: 1 Hour **Total marks: 15**

Notes:

1. Answer should be brief and to the point and be supplemented with neat sketches wherever necessary.
2. Any missing data may be assumed suitably with proper justification.
3. All symbols, abbreviation have their usual meaning.

SECTION-A

Attempt all question's **[2x3=6]**

1. **(a)** What do you mean by form factor in a periodic waveform?
   (b) Define an ideal voltage source, also draw its *i-v* characteristics.

2. For the circuit shown in figure.1, $i_1(t) = 2\sin(50t - 60^\circ)$ and $i_2(t) = 5\sin(50t - 30^\circ)$.
   (a) Write the time expression for $i_L(t)$.
   (b) Draw phasor diagram showing i_1, i_2 and i_L.

3. Evaluate the voltage v_x across 6Ω resistor as marked in the circuit (figure.2) using mesh analysis.

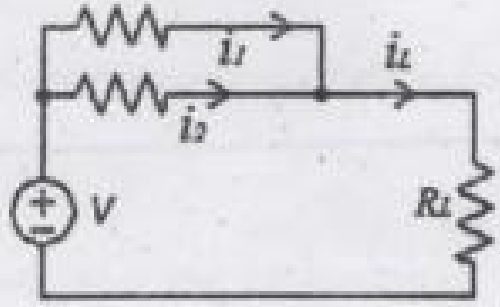


fig.1

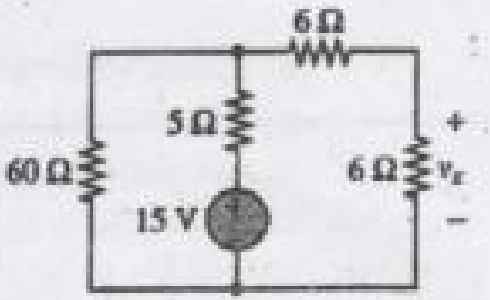


fig.2

SECTION-B

Attempt all question's **[3x3=9]**

1. A coil connected to a 240 V, 50 Hz supply has a resistance of 4Ω and an inductance of 9.55mH. Calculate,
   a) the impedance
   b) the current drawn
   c) phase angle between supply voltage and current

2. **(a)** State maximum power transfer theorem in a dc circuit.
   (b) Define unilateral and bilateral elements, give suitable example in each case.

3. **(a)** Evaluate Thevenin's equivalent parameters for the given circuit in figure 3.
   (b) If a load resistance of 10Ω is connected between terminal a-b, evaluate the maximum power which can be delivered to the load.

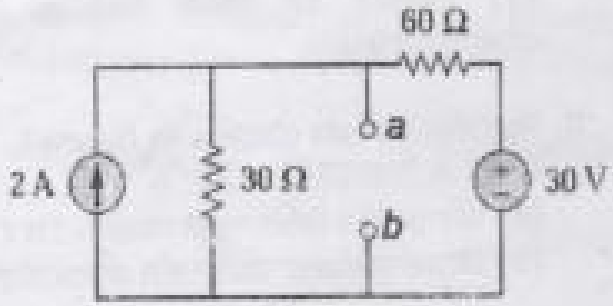


fig.3

University Roll No.....

First Term Examination
EVEN-Semester, 2018-19
B.Tech, Ist Year
Basic Electrical Engineering, BEEG0001

Time: 1 Hour **Total Marks:15**

Section-A

Note: Attempt All Questions. [2x3=6]

I. Define ideal voltage source and ideal current source with necessary characteristics. What is the value of internal resistance for an ideal current source and an ideal voltage source? Explain.

II. Using mesh analysis calculate the mesh currents and also find the power supplied by 80V voltage source for the given Fig.1.

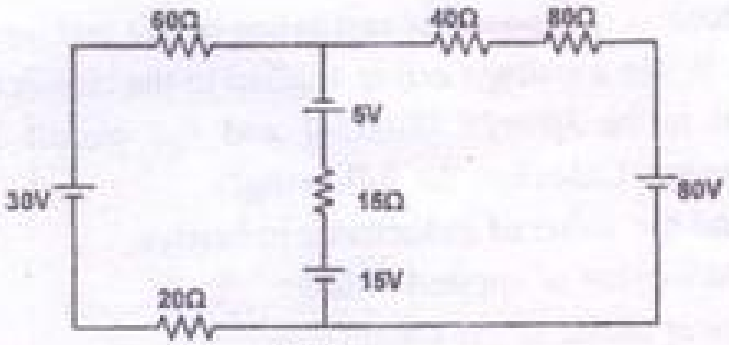


Fig.1

III. Estimate the average and root mean square value for the waveform given in Fig.2.

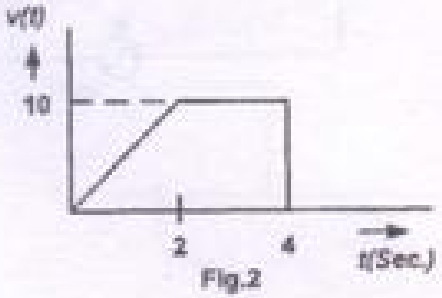


Fig.2

Section-B

Note: Attempt All Questions. [3x3=9]

I. A. Define the following terms:

a. Active and Passive Elements with examples.

b. Unilateral and Bilateral Elements with examples.

c. Power Triangle.

II. For the circuit of Fig.3, calculate the value of R_L for maximum power dissipation in it and the value of this maximum power.

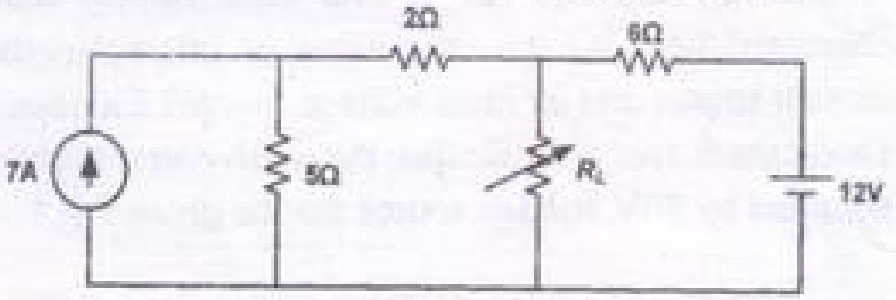


Fig.3

III. A circuit is composed of resistance of 9Ω and an inductive reactance of 12Ω. When a voltage *e(t)* is applied to the circuit the resulting current is found to be $i(t)=28.3\sin 314t$ and the circuit is operating at 50Hz frequency. Calculate the following:

a. Find the value of inductance in henrys.

b. RMS value of applied voltage.

c. Power factor of the circuit.

d. Active power of the circuit.

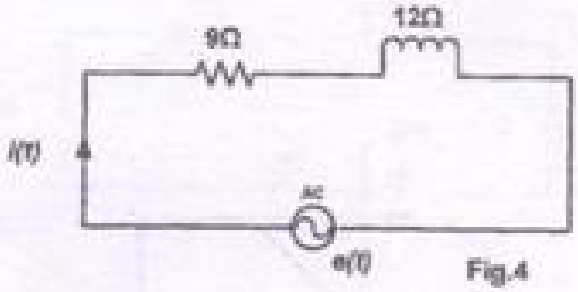


Fig.4

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Mid-Term Examination, odd semester, 2019-20

B.Tech (CS,EE,EN), I Year, I sem

BEEG 1001:Basic Electrical Engineering

Time: 2 Hours **Maximum Marks: 30**

Notes:

1. Answer should be brief and to the point and be supplemented with neat sketches wherever necessary.
2. Any missing data may be assumed suitably with proper justification.
3. All symbols, abbreviation have their usual meaning.

SECTION-A

Attempt all question's **[3x2=6]**

1. What do you mean by unilateral and bilateral element? Give a suitable example in each case.
2. Distinguish between ideal and practical voltage source.
3. Enlist advantages of a three phase system over single phase system.

SECTION-B

Attempt all question's **[3x3=9]**

1. State thevenin's theorem and calculate the thevenin's equivalent parameters for the circuit shown in fig.1.

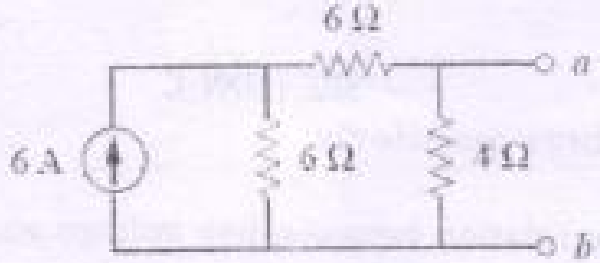


Figure 1

2. **(a)** State superposition theorem. Can it be used to calculate power, justify your answer? **(2)**

(b) For the given circuit in fig.2 calculate voltage across 1Ω resistor. **(1)**

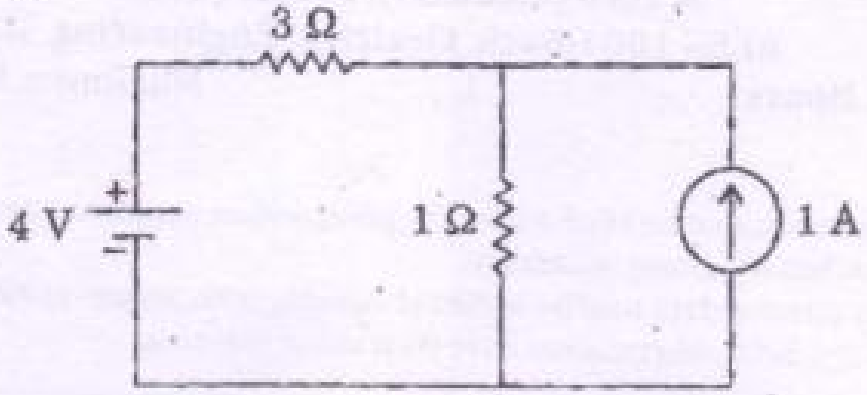


Figure 2

3. For the circuit shown in fig.3, $i_1(t)=10\sin(50t-60^\circ)$ and $i_2(t)=12\sin(50t-30^\circ)$.

(a) Write the time expression for $i(t)$.

(b) Evaluate the effective value of $i(t)$.

(c) Draw phasor diagram showing i_1,i_2 and i.

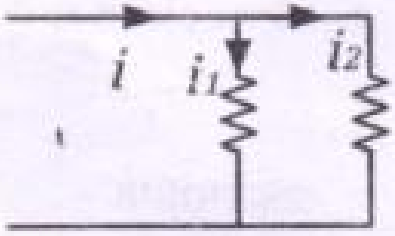


Figure 3

SECTION-C

Attempt any three question's **[3x5=15]**

1. Derive the relation between line voltage and phase voltage for a balanced three phase star connected system.

2. Using nodal analysis, find v_o in the circuit of Fig.4

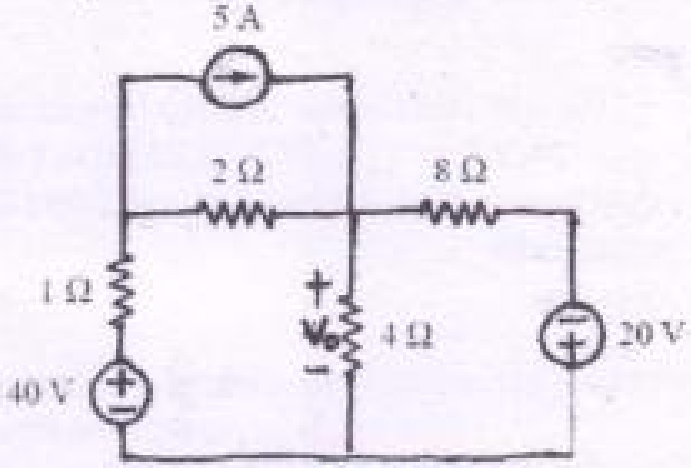


Figure 4

3. (a)Define power factor for an ac circuit. (1)
(b)The instantaneous value of current in an ac circuit is represented as $i(t)=150\sin(60\pi t)$ amperes. Evaluate amplitude and the frequency of the ac current. (2)
(c) State maximum power transfer theorem in a dc circuit. (2)

4. A coil consists of a resistance of 100Ω and an inductance of 200 mH. If an alternating voltage, v, given by $v(t)=200\sin(500t)$ volts is applied across the coil, calculate
(a) the circuit impedance,
(b) the current flowing,
(c) the p.d. across the resistance,
(d) the p.d. across the inductance and
(e) the phase angle between voltage and current.

Printed Pages:03 University Roll No.....

Mid-Term Examination, Odd Semester 2021-22

B.Tech. (common), 1st Year, 1st Semester

BEEG1001/BEEG0001: BASIC ELECTRICAL ENGINEERING

Time: 2 Hours **Maximum Marks: 30**

Section- A

Note: Attempt All Three Questions. 3 x 2 = 6 Marks

I. Define the terms unilateral and bilateral elements using suitable examples.

II. Find the current *Io* in Fig.1.

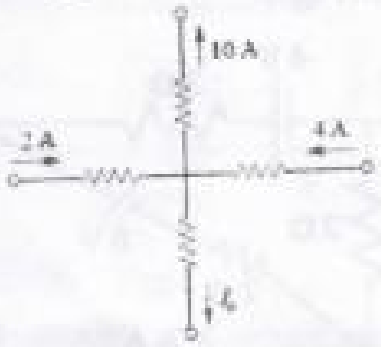


Fig.1

III. Find the amplitudes and frequencies of i=42.1sin (377t + 30°).

Section- B

Note: Attempt All Three Questions. 3x3=9Marks

I. If $v1 = 30 \sin(\omega t - 10°)$ and $v2 = 20 \sin(\omega t + 50°)$, then calculate:

(a) The phase difference between v1 and v2.

(b) v=v1+v2.

(c) Draw the phasor diagram of v1 and v2.

II. Calculate the average and effective values of the following waveform:

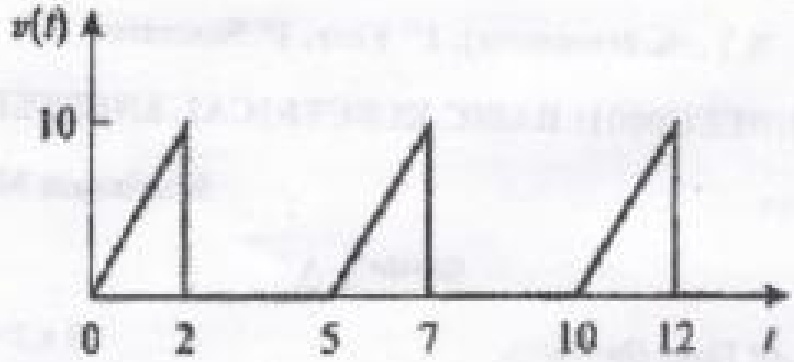


Fig.2

III. Using the mesh analysis, determine the current through 3 Ω resistor as shown in Fig3.

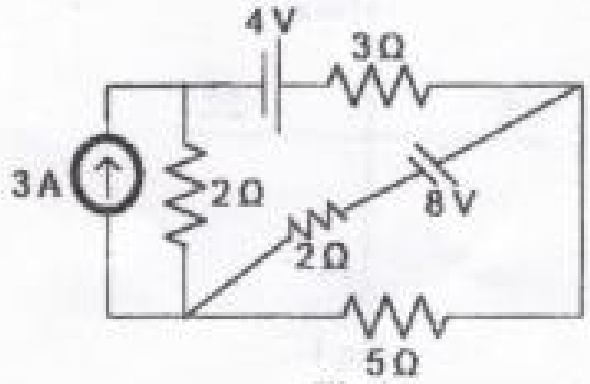


Fig.3

Section – C

Note: Attempt Any Three Questions. 3 x 5 = 15 Marks

I. State and prove maximum power transfer theorem and draw graph between powers versus load resistance.

II. An AC sinusoidal voltage, Vs=160+j120V is applied to a circuit. The resulting current is I= -4+j10A. Find the impedance of the

circuit and state whether it is inductive or capacitive. Also find the active power and apparent power.

III. A coil of inductance 80 mH and resistance 60Ω is connected to a 200V, 50Hz supply. Calculate the circuit impedance and the current taken from the supply. Find also the phase angle between the current and the supply voltage.

IV. For the circuit as shown in the Fig.4, with RL=28ohm, obtain the Thevenin's equivalent across terminals a-b, and also:

a. Calculate the current in load resistance

b. Find voltage across the load resistance.

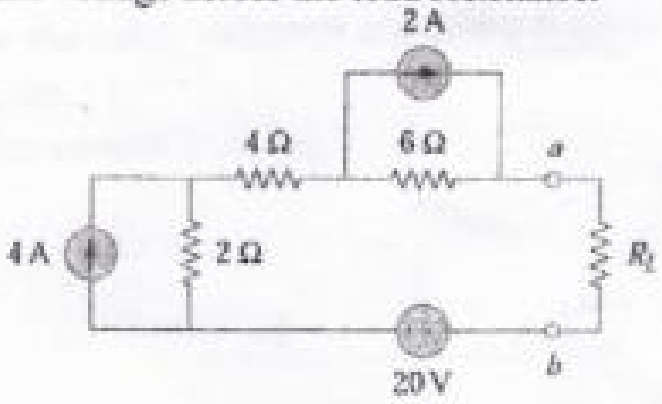


Fig.4

V. (a) What are the advantages of three-phase system over single-phase system?

(b) State and explain superposition theorem. What are the limitations of superposition theorem?

Course Name: B.Tech

Course Outcome

CO1- *Define the basic concept of Active and Passive elements, Linear & non-linear elements, Unilateral and Bilateral Elements, Sources-Ideal & Practical voltage and current sources*

CO2- *Explain the concept of KVL/KCL and can calculate the current, voltage and power by using nodal method, mesh method, Thevenin's theorem, Super position Theorem and Maximum power transfer theorem*

CO3- *To evaluate the steady state behavior of single phase and three phase AC electrical circuits*

CO4- *Analyze the Magnetic circuit, principle of operation and efficiency of transformer*

CO5- *Analyze the components of low voltage electrical installation*

CO6- *Explain the various machines like DC Machine, Induction motor and synchronous motor in terms of working principle and applications*

Printed Pages: 2 **University Roll No. .....**

Mid Term Examination, Odd Semester 2022-23

Program (B.Tech), 1st Year, 1st Semester

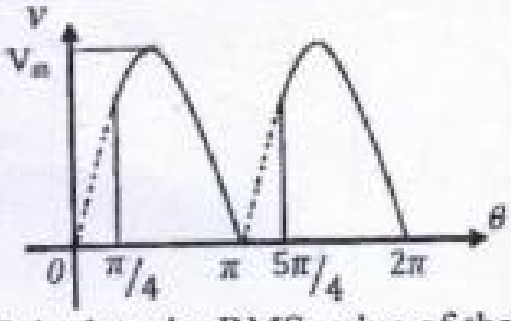
Subject Code & Subject Name- BEEG1001, BASIC ELECTRICAL ENGINEERING

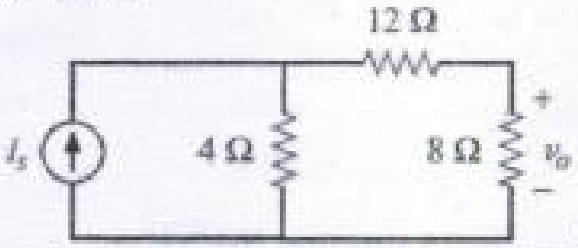
Time: 2 Hours **Maximum Marks: 30**

Instruction for students: Attempt All Questions

Section – A

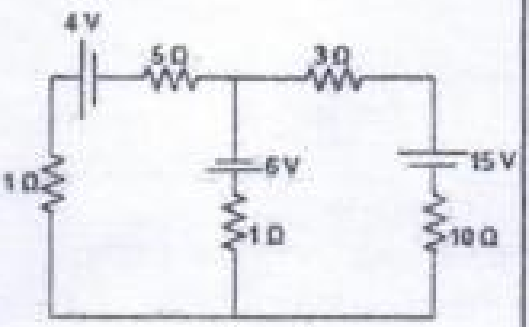
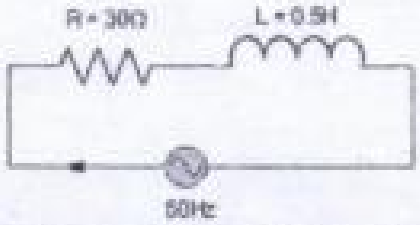
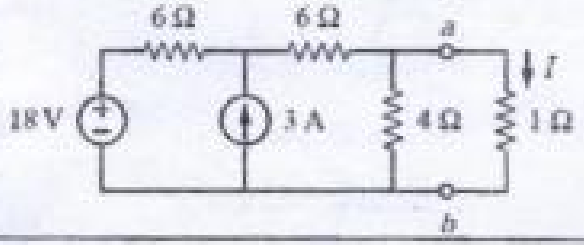
Attempt All Questions 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Differentiate between Ideal and Practical energy sources. Also, show their corresponding *i-v* characteristics.	3	1	R	F
2	State and derive the Maximum Power Transfer Theorem.	3	2	R	C
3	 Figure 1 Calculate the RMS value of the waveform given in Fig. 1. The peak value of the waveform is 20V.	3	3	An	M
4	a. A sinusoidal current of $20\angle 45°$ is added to another sinusoidal current of $30\angle 60°$. Find the resultant current. b. An alternating current varying sinusoidally with a frequency of 50 Hz has an RMS value of 20 A. Write down the equation for the instantaneous value.	3	3	R	C

5	For the circuit given in Fig. 2 find v_o when: i. $i_s = 15$ A ii. $i_s = 30$ A.  Figure 2	3	2	A	P

Section – B

Attempt All Questions 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
6	a. Differentiate between loop and mesh. b. Using mesh analysis determine the two mesh currents for the circuit given in Fig. 3.  Figure 3	5	2	E	P
7	In the series R-L circuit given in Fig. 4, R=30Ω and L=0.5H. The supply voltage is 640V and supply frequency is 50 Hz. Determine the following: a. Inductive reactance & Impedance b. Current through the circuit c. Power Factor d. Phasor diagram  Figure 4	5	3	An	M
8	a. State Thevenin Theorem using a suitable diagram b. For the circuit given in Fig. 5, find the Thevenin equivalent across the terminals a-b and then find I.  Figure 5	5	2	E	C

Course Name: BASIC ELECTRICAL ENGINEERING

Course Outcome

CO1-Define the basic concept of active & passive elements, Linear & non-linear elements, Unilateral and Bilateral Elements, Ideal & Practical voltage and current sources.
CO2-Illustrate the working principle of various machines like DC Machine, and induction motor.
CO3-Classify DC motors and induction motors.
CO4- Apply the concept of KVL/KCL, Thevenin's theorem, Super position Theorem and Maximum power transfer theorem to solve the electrical circuits.
CO5-Compute the parameters of single phase and three phase AC electrical circuits, magnetic circuit and transformer.

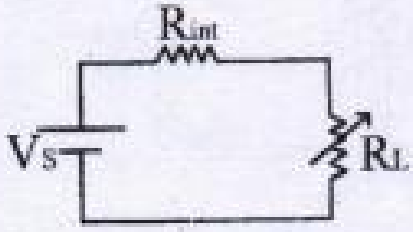
Printed Pages:2 **University Roll No. .....**

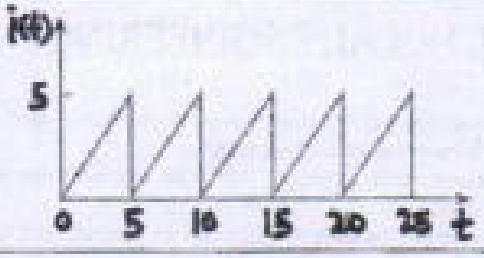
Mid Term Examination, Even Semester 2022-23
B.Tech (All Branch), Ist Year, IInd Semester
BEEG 1001: BASIC ELECTRICAL ENGINEERING

Time: 2 Hours **Maximum Marks: 30**

Section – A

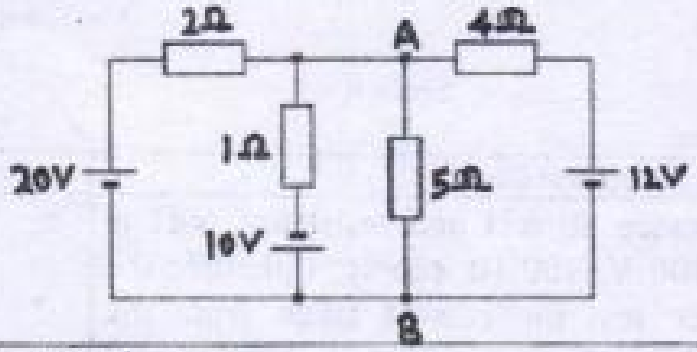
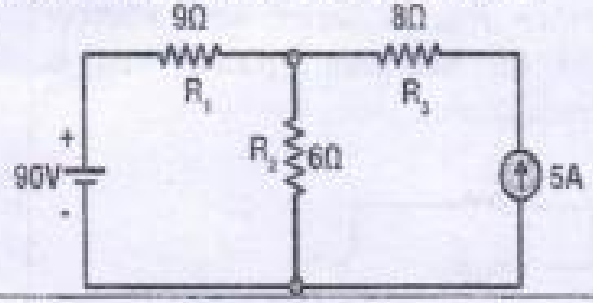
Attempt All Questions 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	A coil of inductance 80 mH and resistance 60Ω is connected to a 200 V, 100 Hz supply. Calculate the circuit impedance and the current taken from the supply. Also find the phase angle between the current and the supply voltage.	3	5	E	P
2	State and explain Superposition theorem. What are its limitations?	3	4	R	F
3	Write Short note on following with suitable examples: (i) Kirchhoff's Voltage Law (KVL) (ii) Kirchhoff's Current Law (KCL)	3	4	R	F
4	A load resistance R_L is connected across the source V_S with internal resistance R_{int} in series with source; obtain the condition for maximum power that is transferred to load from source. 	3	4	An	C
5	Calculate the Average and RMS of the waveform given below:	3	5	E	P

Section – B

Attempt All Questions 5 X 3 = 15 Marks

No	Detail of Question	Marks	CO	BL	KL
6	State Thevenin's Theorem. Calculate the voltage across the 5Ω resistance using Thevenin's theorem. 	5	4	E	P
7	Differentiate between: (i) Unilateral and Bi-lateral elements (ii) Active and Passive elements (iii) Ideal and Practical Voltage Sources	5	1	U	C
8	In the given circuit use mesh analysis to determine the following: (i) Current through each resistor (ii) Potential difference across 8Ω resistor. 	5	4	E	P