Electrical Circuit Analysis question Papers of SET 1 & 2 for R16 and R19 Regulations

2 messages

Rajitha Korrapati <korrapati.rajitha@gmail.com>
To: ace1@jntugv.edu.in

Fri, Mar 22, 2024 at 1:42 PM

Hello Sir, Please find the attached files regarding Electrical Circuit Analysis Question Papers of SET 1 & 2 for R16 and R19 Regulations.

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Regards
K.Rajitha
Assistant Professor
Malineni Women's Engg College, Pulladigunta
Guntur,AP-522017

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4 attachments

📄 **R19 Electrical Circuit Analysis QP _SET 2.docx**
169K

📄 **R16 Electrical Circuit Analysis QP_SET 2.docx**
103K

📄 **R16 Electrical Circuit Analysis QP_SET 1.docx**
90K

📄 **R19 Electrical Circuit Analysis QP_SET 1.docx**
111K

Addt. Controller of Examinations 1 JNTUGV <ace1@jntugv.edu.in>
To: Rajitha Korrapati <korrapati.rajitha@gmail.com>

Fri, Mar 22, 2024 at 2:26 PM

Thank you sir, we received your mail.
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PRINCIPAL
MALINENI LAKSHMAIAH
WOMEN'S ENGINEERING COLLEGE
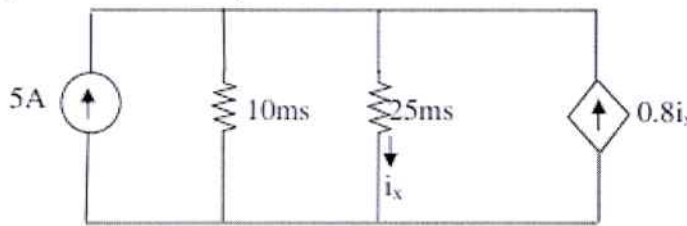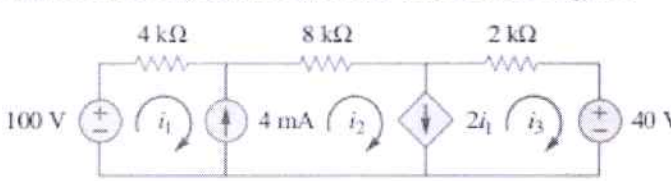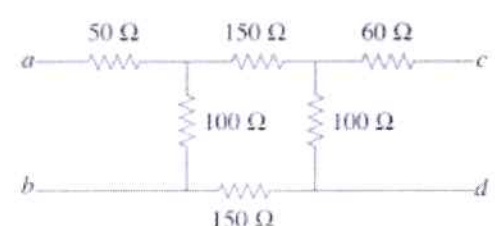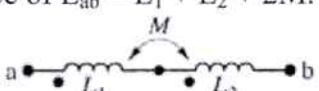PULLADIGUNTA, GUNTUR-522017.

Code No: R19ES1217   **R19**   Set No. 1

II B. Tech I Semester Supplementary Examinations, June– 2023
Electrical Circuit Analysis-I

(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 75

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks
*****
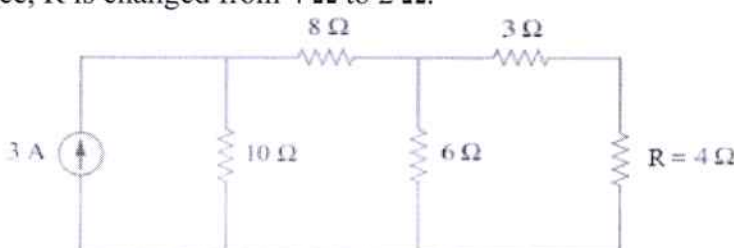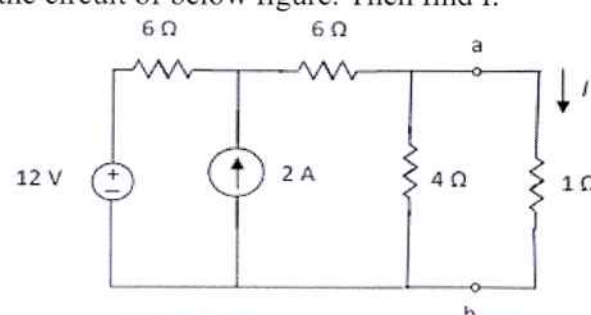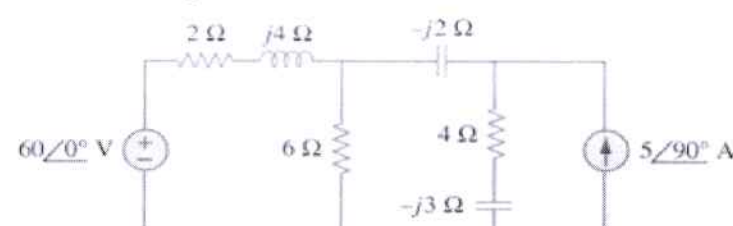
1	a)	Find the power absorbed by each element in the circuit shown in figure	[8]
	b)	Explain the source transformation with examples.	[7]
		(OR)	
2	a)	Find the mesh currents i_1, i_2, and i_3 in the network of figure.	[7]
	b)	Consider the circuit in figure, find the equivalent resistance across the terminals: (i) a-b and (ii) c-d.	[8]
		Figure	
3	a)	Show that the two coupled coils in figure can be replaced by a single coil having an inductance of $L_{ab} = L_1 + L_2 + 2M$.	[7]
		Figure	
	b)	Define the following Terms: i) Self Inductance ii) Mutual Inductance iii) Coupled Coils iv) Coupling Coefficient	[8]
		(OR)	

4	a)	A coil of 200 turns is wound uniformly over a wooden ring having a mean circumference of 600 mm and a uniform cross sectional area of 500 mm². If the current through the coil is 4 A, calculate: (i) magnetic field strength, (ii) flux density, and (iii) total flux.	[7]
	b)	Two coils of self-inductances L1 and L2 are mutually coupled. Derive the expression for the net inductance of the coils if they are connected in Series Aiding.	[8]
5	a)	Explain the following terms: i)RMS value ii)Average Value iii) Peak factor iv) Form factor	[7]
	b)	A Voltage v(t) =141.4 sin (314t+10⁰) is applied to a circuit and a steady current given by i(t) = 14.14 sin (314t-20⁰) is found to flow through it. Determine: (i) Power factor of the circuit (ii) Power delivered to the circuit. Also draw the phasor diagram.	[8]

A Voltage $v(t) = 141.4 \sin(314t+10^0)$ is applied to a circuit and a steady current given by $i(t) = 14.14 \sin(314t-20^0)$ is found to flow through it. Determine: (i) Power factor of the circuit (ii) Power delivered to the circuit. Also draw the phasor diagram.

(OR)			
6	a)	A resistance and an inductance are connected in series across 250V, AC supply. When the frequency is 40Hz, the current is 1.9A and when the frequency is 50Hz, the current is 1.7A. Determine (i) resistance and inductance of the circuit (ii) power factor of the circuit at 50Hz (iii) power consumed at 50Hz.	[7]
	b)	A coil having a resistance of 10 ohms and an inductance of 0.2 H is connected in series with a 100 µF capacitor are fed with 230 V, 50 Hz AC supply. Calculate (i) active and reactive components of current (ii) voltage across the coil. Draw the phasor diagram	[8]
7	a)	A series RLC circuit consists of R =25Ω, L =0.02 H and C =0.06µF. Calculate the frequency at resonance. If a 25 Volts of frequency equal to the frequency of resonance is applied to this circuit, calculate the values of voltage across C and L respectively. Find the frequencies at which these voltages are maximum?	[8]
	b)	In a series resonant network R = 6 ohm. The resonant frequency 0.5 MHz and the band width is 105 rad/sec. Compute L and C of the network	[7]
(OR)			
8	a)	An inductive coil having a resistance of 30 ohm and inductance of 0.03H is connected in series with 0.03 µF capacitor. Calculate i) Q of the coil ii) Resonant frequency and iii) the half-power frequencies.	[7]
	b)	Explain the meaning of half-power frequencies and derive the expressions for a series RLC Circuit.	[8]
9	a)	Verify the compensation theorem of the circuit in figure, when	[7]

		resistance, R is changed from 4 Ω to 2 Ω.	
	b)	State and explain thevenin's theorem. Also explain the limitations of this theorem.	[8]
		(OR)	
10	a)	Using Norton's theorem, find the equivalent circuit to the left of the terminals in the circuit of below figure. Then find I.	[7]
	b)	Assuming that $(4 - j3)$ Ω branch as load in the following circuit, determine maximum power transfer to this branch.	[8]

Code No: R19ES1217

R19

Set No. 2

II B. Tech I Semester Supplementary Examinations, June– 2023
Electrical Circuit Analysis-I

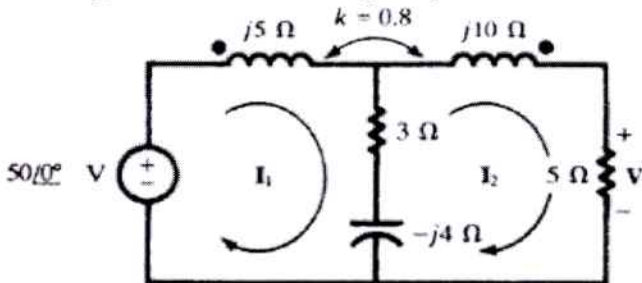(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks
*****

1	a)	Calculate the effective resistance between the points A and B in the circuit shown in below figure.	[7]
	b)	Explain the steps various involved in network reduction from Delta to Star.	[8]
		(OR)	
2	a)	For the bridge network in figure, find i_0 using mesh analysis.	[7]
	b)	Find R_{ab} for the following circuit	[8]
3	a)	Explain the following terms: (i) Reluctance (ii) mmf (iii) Co-efficient of coupling (iv) Magnetic flux density (v) Magnetic field strength.	[7]
	b)	The total inductance of two coils is measured to be 13 mH. If one of the coil is reversed total inductance is found to be 8 mH. If inductance of one coil is known to be 5 mH, calculate inductance of the other coil, the	[8]

		mutual inductance, and the coefficient of coupling between the two coils	
		(OR)	
4	a)	How do you use dot convention? For mutually coupled parallel coils show that $L_{eq} = \dfrac{L_1 L_2 - M^2}{L_1 + L_2 - 2M}$	[7]
	b)	Compute the voltage V for the following coupled circuit:	[8]
5	a)	For a half-wave rectified alternating current, find average value, rms value and form factor. Find average and rms values when $I_m=3A$.	[7]
	b)	A capacitor having a reactance of 5 Ω is connected in series with a resistor of 10 Ω. This circuit is then connected (a) in series and (b) in parallel with a coil of impedance (5+j7) Ω. Calculate for each case (i) the current drawn from the supply, (ii) the power supplied, and (iii) the power factor of the whole circuit	[8]
		(OR)	
6	a)	Determine the rms value of the current waveform shown below. If this current is passed through a resistor of 9Ω resistor, Calculate the average power absorbed by the resistor.	[8]
	b)	Describe in detail the analogy between electrical and magnetic circuits.	[7]
7	a)	Show that for an RLC series resonant circuit, $Q_r = \dfrac{\omega_r L}{R} = \dfrac{f_r}{Band\ width}$	[7]
	b)	An RLC Series circuit consists of R=1kΩ, L=100mH, C=10μF. If a voltage of 100V is applied across the combination, determine resonant frequency, quality factor and bandwidth.	[8]
		(OR)	
8	a)	Derive the Q – factor for the Parallel RLC Resonating circuit	[7]
	b)	A series RLC circuit consists of R =25Ω, L =0.02 H and C =0.06μF. Calculate the frequency at resonance. If a 25 Volts of frequency equal to the frequency of resonance is applied to this circuit, calculate the values of voltage across C and L respectively. Find the frequencies at which these voltages are maximum?	[8]

9	a)	Find the thevenin's equivalent for the circuit shown below:	[7]
	b)	Solve for the current I in the circuit by superposition theorem.	[8]
		(OR)	
10	a)	Verify the reciprocity theorem using the network given in figure	[7]
	b)	State and explain millman's Theorem	[8]

II B. Tech I Semester Supplementary Examinations, June -2023
Electrical Circuit Analysis-I
(Electrical and Electronics Engineering)

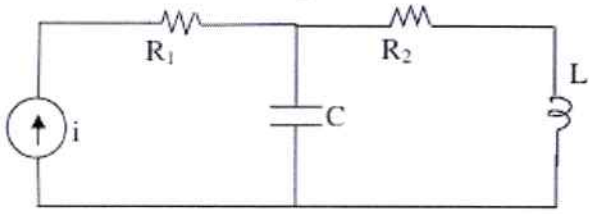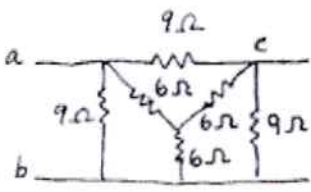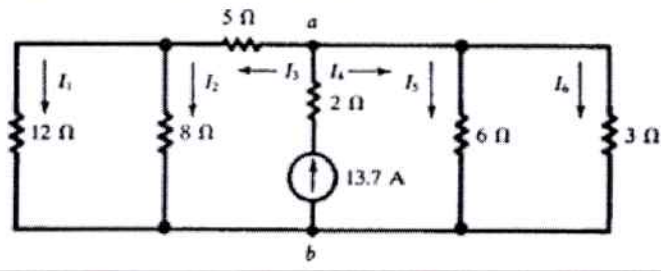Time: 3 hours   Max. Marks: 70

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
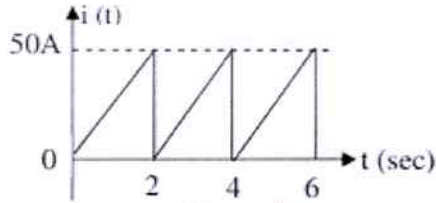*Answer any FOUR questions from Part-B*
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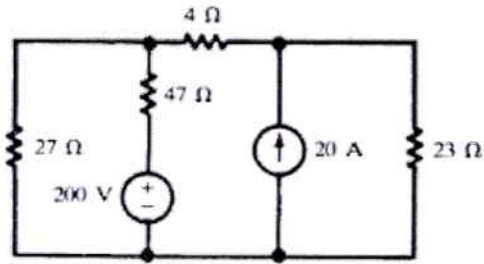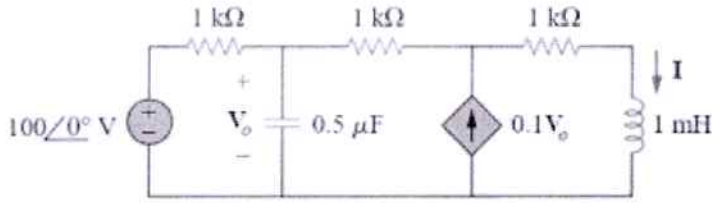|		**PART–A***(14 Marks)*	
1.	a)	What are the uses of source transformation?	[2M]
	b)	Draw the dual of the network shown in figure	[3M]
	c)	A series RLC circuit has a resonant frequency of 12 KHZ. If R=5 ohms and X_L at resonance is 300 ohms, find the bandwidth.	[2M]
	d)	Distinguish between a Series and a parallel magnetic circuit.	[3M]
	e)	What is a locus diagram? What are the benefits with locus diagram?	[2M]
	f)	State Norton's theorem.	[2M]
		PART–B*(4x14 = 56 Marks)*	
2.	a)	Explain the star-delta transformation and delta-star transformation and derive the expressions for equivalent resistances.	[7M]
	b)	Calculate the resistance across the terminal's ab for the following network:	[7M]
3.	a)	Explain the steps involved in finding the fundamental cut sets and also list its properties.	[7M]
	b)	Find all branch currents for the network shown below:	[7M]
4.	a)	Define the following terms w.r.t magnetic circuits: i) Flux density ii) magneto motive force iii) magnetic field strength iv) Reluctance	[7M]

	b)	Two coils of self-inductances L1 and L2 are mutually coupled. Derive the expression for the net inductance of the coils if they are connected in parallel opposing.	[7M]
5.	a)	Calculate RMS value, average value, and form factor for the saw waveform shown in Figure.	[7M]

	b)	The current is 15 mH inductor can be expressed as $i(t)=(2-e^{-1000t})$ mA. Find (i) voltage across the inductor (ii) instantaneous power.	[7M]
6.	a)	Show that the resonant frequency ω_0 of an RLC series circuit is the geometric mean of ω_1 and ω_2, the lower and upper half-power frequencies respectively.	[7M]
	b)	Analyze the phase relations in a pure resistor, pure inductor and pure capacitor with necessary waveforms and related vector diagrams.	[7M]
7.	a)	Compute the current in the 23- ohm resistor by applying Super position theorem.	[7M]

	b)	By using the nodal analysis determine various node voltages in the following circuit.	[7M]

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II B. Tech I Semester Supplementary Examinations, June -2023
Electrical Circuit Analysis-I
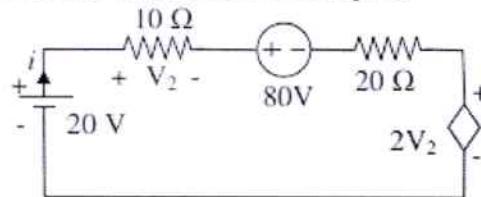(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
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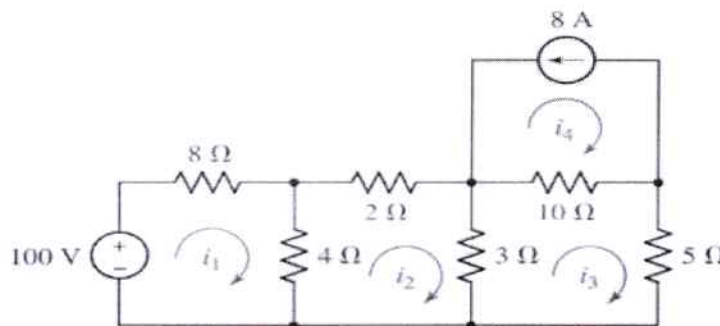|		**PART–A***(14 Marks)*	
1.	a)	What is the value of V2 in the circuit shown in figure	[2M]
	b)	List the properties of a tree in graph theory.	[3M]
	c)	Define MMF and reluctance.	[2M]
	d)	What is the difference between instantaneous power and complex power?	[3M]
	e)	Distinguish between periodic and A periodic waveforms	[2M]
	f)	State Compensation theorem.	[2M]
		PART–B*(4x14 = 56 Marks)*	
2.	a)	By using the mesh analysis determine the loop currents in the following circuit.	[7M]
	b)	State and explain the ohms law and also explain about the Resistance, Inductance and capacitance parameters.	[7M]
3.	a)	For the network shown in figure 3, obtain the oriented graph of the network and write the cut-set schedule of the graph and determine loop currents.	[7M]
	b)	Explain the star-delta transformation and delta-star transformation and derive the expressions for equivalent resistances.	[7M]
4.	a)	Two coils of self-inductances L1 and L2 are mutually coupled. Derive the	[7M]
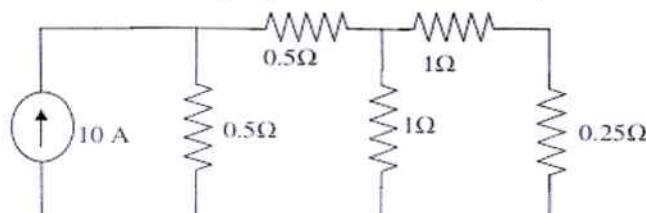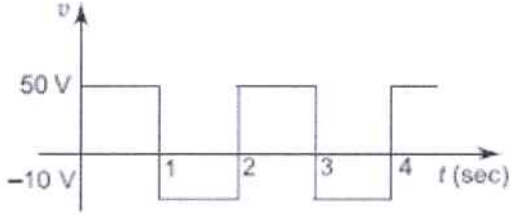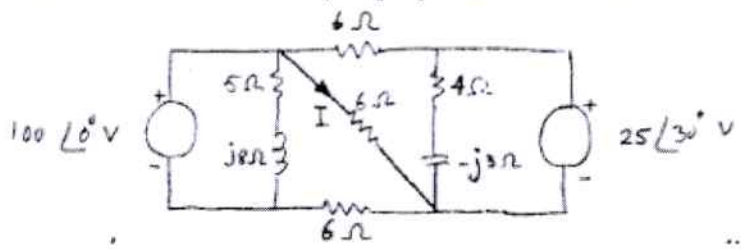
		expression for the net inductance of the coils if they are connected in parallel opposing.	
	b)	Define the following Terms: i) Self Inductance ii) Mutual Inductance ii) Coupled Coils iv) Coupling Coefficient	[7M]
5.	a)	A 20 ohms resistance and 30 mH inductance are connected in series and the circuit is fed from 230 V, 50 Hz AC supply. Find (i) Inductive reactance and total impedance (ii) current in the circuit (iii) voltage across resistance and inductance (iv) real, reactive and apparent power (v) Power factor.	[7M]
	b)	Calculate the average and effective values of the following waveform and also find the form factor	[7M]
6.	a)	Analyze the Series RLC circuit with corresponding impedance diagram along with supporting Phasor diagram.	[7M]
	b)	For a given series RLC circuit with R=120Ω, L=0.6H and C=70μF, Calculate the resonance, lower and upper half power frequencies.	[7M]
7.	a)	Solve for the current I in the circuit by superposition theorem.	[7M]
	b)	State and explain Maximum Power Transfer theorem.	[7M]

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M Gmail   Yenugula Bhaskararao <bhaskararao.yenugula@gmail.com>

Re: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING question papers of SET -1 @ SET-2 for R16 and R19 regulatons. reg

Addt. Controller of Examinations 1 JNTUGV <ace1@jntugv.edu.in>   Sat, Mar 23, 2024 at 1:43 PM
To: Yenugula Bhaskararao <bhaskararao.yenugula@gmail.com>

Thank you sir, we received your mail.

On Sat, Mar 23, 2024 at 11:41 AM Yenugula Bhaskararao <bhaskararao.yenugula@gmail.com> wrote:
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING question papers of SET -1 @ SET-2 for R16 and R19 regulations. reg

Thanking you sir
Y. BHASKARARAO
ASSOCIATE PROFESSOR.
MLWEC, GUNTUR
9032947721

PRINCIPAL
MALINENI LAKSHMAIAH
WOMEN'S ENGINEERING COLLEGE
PULLADIGUNTA, GUNTUR-522017.

Code No: **R19** Set No. 1

I B. Tech II Semester Supplementary Examinations, June– 2023
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
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Time: 3 hours   Max. Marks: 75

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks
*****

1	a)	**Unit -1** State and explain Kirchhoff's Law with an example of each.	[7]
	b)	Derive an expression for the equivalent capacitance of a group of capacitors when they are connected (i) in parallel (ii) in series.	[8]
		(OR)	
2	a)	**Unit-1** List and explain the basic types of network Elements.	[7]
	b)	Calculate the current supplied by the 12 V battery for the network shown below: 	[8]
3	a)	**Unit-2** Explain the various types of DC generators and list their applications.	[7]
	b)	Explain the speed-current, torque-current and speed-torque characteristics of dc shunt motor.	[8]
		(OR)	
4	a)	**Unit-2** Draw and explain the working of a Three Point Starter.	[7]
	b)	Explain Swinburne's Test -Brake test on DC Shunt Motor with neat diagram.	[8]
5	a)	**Unit-3** Explain the construction and working principle of a transformer.	[7]
	b)	A 3000/200-V, 50-Hz, 1-phase transformer is built on a core having an effective cross-sectional area of 150 cm2 and has 60 turns in the low-voltage winding.Calculate (i) the value of the maximum flux density in the core (ii)the number of turns in the high-voltage winding.	[8]
		(OR)	
6	a)	**Unit-3** What do you mean by synchronous reactance? How do you determine synchronous impedance of the alternator	[7]

	b)	Explain the general working principle of a three phase induction motor and also list its advantages and disadvantages.	[8]
7	a)	**Unit-4** Explain in detail about the Forward biased p – n Junction and reverse biased p – n junction with necessary diagrams.	[7]
	b)	Draw the OP – AMP symbol and also give its configuration and explain the significanceofits terminals.	[8]
		(OR)	
8	a)	**Unit-4** Explain the operation of a full wave bridge rectifier with relevant waveforms.	[7]
	b)	Explain with a neat diagram that how an OP – AMP is realized as an Integrator.	[8]
9	a)	**Unit-5** Discuss the operation of an N – P – N transistor with a neat circuit.	[7]
	b)	Explain in detail about the frequency response of CE Amplifier.	[8]
		(OR)	
10	a)	**Unit-5** Explain in detail about Common base circuit configuration with a neat diagram.	[7]
	b)	What are the two types of feedback? What are the advantages and disadvantages of feedback?	[8]

Code No:

R19

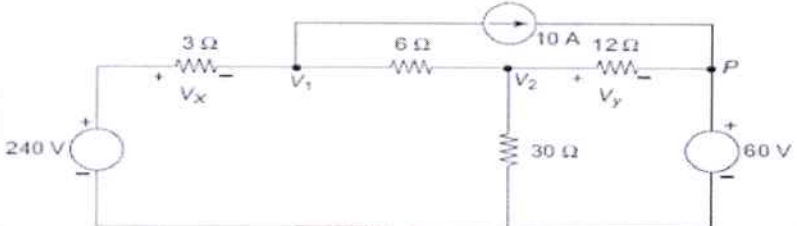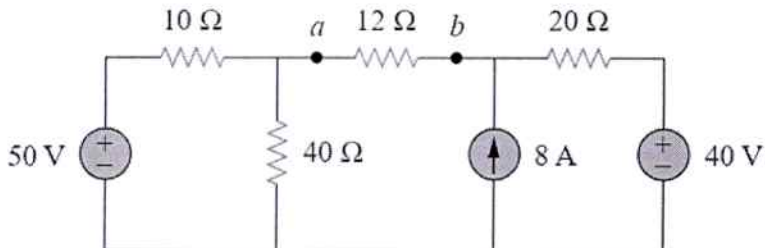### Set No. 2

IIB. Tech I Semester Supplementary Examinations, June– 2023
Name of the Subject
(Name of the Branch)

Time: 3 hours

Max. Marks: 75

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks
*****

1	a)	**Unit-1** Explain the following: (i)Ohms law (ii) Dependent and Independent sources	[7]
	b)	For the following circuit, use Nodal analysis to determine Vx and Vs. What is the power consumed by the 6Ω resistance? 	[8]
		(OR)	
2	a)	**Unit-1** How do you use Kirchhoff's Current and Voltage Laws to determine branch currents and loop voltages?	[7]
	b)	Determine the voltage across the terminals 'a' and 'b' in the following circuit 	[8]
3	a)	**Unit-2** Explain the principle of operation of dc generator and derive emf equation of a dc generator.	[7]
	b)	A four-pole generator, having wave-wound armature winding has 51 slots, each slot containing 20 conductors. What will be the voltage generated in the machine when driven at 1500 rpm assuming the flux per pole to be 6.0 mWb?	[8]
		(OR)	
4	a)	**Unit-2** Explain the speed control methods of DC motor	[7]
	b)	List and explain various losses that occur in DC Machines.	[8]

5	a)	**Unit-3** Explain briefly the action of a transformer and show that the voltage ratio of the primary and secondary windings is same as their turn's ratio.	[7]
	b)	The primary and secondary windings of a 500 KVA transformer have R1 = 0.4Ω and R2 = 0.001Ω respectively. The primary and secondary voltages are 6600 V and 440 V respectively. The iron loss is 3 kW. Calculate the efficiency on full load at 0.75 power factor lagging.	[8]
		(OR)	
6	a)	**Unit-3** Explain the principle of operation of a Synchronous motor.	[7]
	b)	Draw the torque – slip characteristics of a three phase induction motor and explain the significance of it.	[8]
7	a)	**Unit-4** Explain in detail about the Forward biased p – n Junction and reverse biased p – n junction with necessary diagrams.	[7]
	b)	Draw and explain the equivalent circuit of a Dual input operational amplifier.	[8]
		(OR)	
8	a)	**Unit-4** Explain the operation of a half wave bridge rectifier with relevant waveforms.	[7]
	b)	Draw the circuit configuration and explain the operation of OP-AMP as inverting amplifier.	[8]
9	a)	**Unit-5** What is Bipolar junction transistor, draw the symbol of it and explain the significance of each.	[7]
	b)	Explain the operation of a Transistor as an Amplifier and give its advantages.	[8]
		(OR)	
10	a)	**Unit-5** Draw the input and output characteristics of n-p-n transistor in common base configuration and explain how they are obtained.	[7]
	b)	What are the two types of feedback? What are the advantages and disadvantages of feedback?	[8]

R16

Set No. 1

I B. Tech II Semester Supplementary Examinations,June -2023
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Branch)

Time: 3 hours   Max. Marks: 70

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

		PART–A(14 Marks)	
1.	a)	Givethevolt–ampererelationsforR,LandCparameters.	[2M]
	b)	ListtheapplicationsofvariousDCMotors.	[3M]
	c)	DrawtheequivalentcircuitofaSingle-phasetransformer.	[2M]
	d)	WhatiscoilspanfactorandDistributionfactorofanAlternator?	[3M]
	e)	Distinguishbetweenn-typesemiconductorandp –typesemiconductor.	[2M]
	f)	What do you understand by the terms Saturation region and cut – off region in transistor characteristics.	[2M]
		PART–B *(4x14 = 56 Marks)*	
2.	a)	State and explain Kirchhoff's Voltage law and Kirchhoff's current law.	[7M]
	b)	Derive an expression for the equivalent capacitance of a group of capacitors when they are connected (i) in parallel (ii) in series.	[7M]
3.	a)	ExplaintheworkingprincipleofaDCgeneratorwithaneatdiagram.	[7M]
	b)	Draw and explain the working of a Three Point Starter.	[7M]
4.	a)	Explain the construction and working principle of a transformer.	[7M]
	b)	A 3000/200-V, 50-Hz, 1-phase transformer is built on a core having an effective cross-sectional area of 150 cm2 and has 60 turns in the low-voltage winding.Calculate (i) the value of the maximum flux density in the core (ii)the number of turns in the high-voltage winding.	[7M]
5.	a)	DerivetheequationofinducedemfofanAlternator.	[7M]
	b)	Draw the torque – slip characteristics of a three phase induction motor and explain the significance of it.	[7M]
6.	a)	Explain in detail about the Forward biased p – n Junction and reverse biased p – n junction with necessary diagrams.	[7M]
	b)	Explain the working of OP – AMP as an integrator with a neat connection diagram.	[7M]
7.	a)	Describe the NPN transistor operation in the common base configuration. What are its operating regions?	[7M]
	b)	ExplaintheoperationofaTransistorasanAmplifierandgiveitsadvantages.	[7M]

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R16

Set No. 2

I B. Tech II Semester Supplementary Examinations,June -2023
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Branch)

Time: 3 hours   Max. Marks: 70

Question paper consists of Part-A and Part-B
*Answer ALL sub questions from Part-A*
Answer any FOUR questions from Part-B
*****

		PART–A*(14 Marks)*	
1.	a)	Write the equations for equivalent resistances for star/delta and delta/star transformations	[2M]
	b)	ExplaintheusesofDC generators.	[3M]
	c)	WhatismeantbySlipofanInductionmotor?	[2M]
	d)	ExplainthesignificanceofDamperwindinginanalternator.	[3M]
	e)	Draw the circuit symbol for junction diode, and list the applications of PN diode.	[2M]
	f)	What is the purpose of bias in a transistor circuit.	[2M]
		PART–B *(4x14 = 56 Marks)*	
2.	a)	List and explain various types of network elements.	[7M]
	b)	UsingtheKCLandKVLequations,findtheV_{ab}inthefollowingcircuit.	[7M]
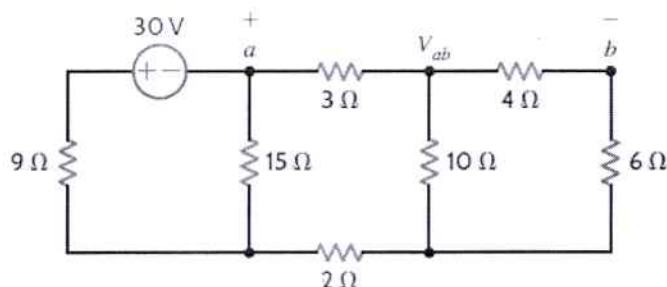
3.	a)	Explain in brief the functions of the following parts of a DC Machine (i) Field Poles (ii) Armature (iii) Brushes and (iv) Commutator	[7M]
	b)	Explain Swinburne's Test -Brake test on DC Shunt Motor with neat diagram.	[7M]
4.	a)	Explain the various losses in a transformer. Describe how each loss varies with the load current, supply voltage and frequency.	[7M]
	b)	The primary and secondary windings of a 500 KVA transformer have R1 = 0.4Ω and R2 = 0.001Ω respectively. The primary and secondary voltages are 6600 V and 440 V respectively. The iron loss is 3 kW. Calculate the efficiency on full load at 0.75 power factor lagging.	[7M]
5.	a)	Describetheprincipleofoperationsofsynchronousmotor.	[7M]
	b)	Explain the general working principle of a three phase induction motor and also list its advantages and disadvantages.	[7M]
6.	a)	Explain Full wave Bridge rectifier with neat circuit diagram and waveforms	[7M]

	b)	Explain the operation of OP AMP as an on-inverting and inverting amplifier.	[7M]
7.	a)	Discuss the operation of an N–P–N transistor with a neat circuit.	[7M]
	b)	What are the two types of feedback? What are the advantages and disadvantages of feedback?	[7M]

<center>*****</center>

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Basic Electrical Engineering question Paper of SET 1 & 2 for R19 Regulation

Venkata Rao venkatarao.srp@gmail.com
to ace1

Sat 23 Mar, 13:4

Sir, Please find the attached file regarding Basic Electrical Engineering question Paper of SET 1 & 2 for R19 Regulation..

With Regards

T Venkata Rao
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