AR18

CODE: 18EST101 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Regular/Supplementary Examinations, November-2020

BASIC ELECTRICAL ENGINEERING

(Common to CE, CSE, IT Branches)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Calculate the equivalent resistance *Rab* in the circuit in Fig. 1. 6M

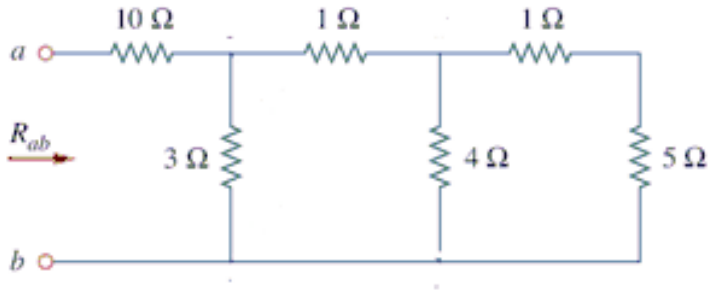

Fig. 1.

b) State and explain KCL and KVL 6M

(OR)

2. a) Find voltage across the 25 Ω in the circuit shown in Fig.2 6M

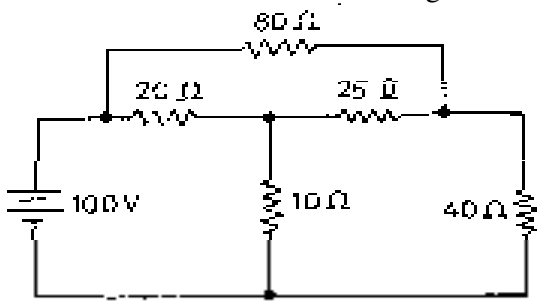

Fig.2

b) Calculate the equivalent resistance R_{ab} in the circuit in Fig. 3 6M

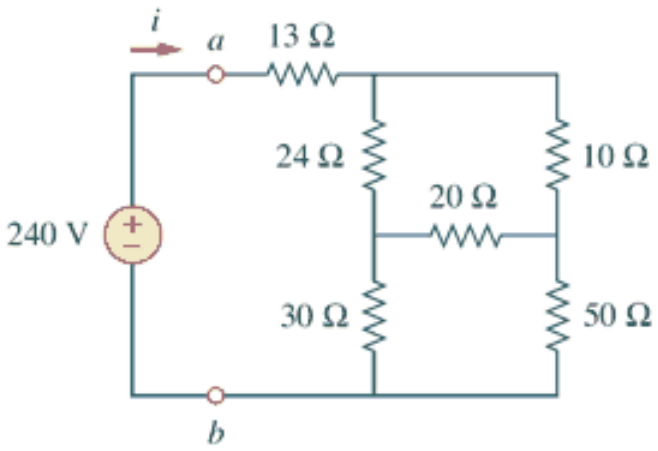

Fig. 3

UNIT-II

3.	a)	A resistance R, an inductance L=0.01 H, and a capacitance C are connected in series. When a voltage v= 400 COS(3000t -10) volts is applied to the series combination, a current flowing is i= 10 COS(3000t - 55) amperes. Find R and C values.	8M
	b)	Define the following i) RMS value, ii) Average value	4M
		(OR)	
4.	a)	In a series RL circuit R= 5 ohms and L= 0.06H and the voltage applied to the circuit is 100 V, 50Hz supply. Find the current and total impedance.	4M
	b)	Determine Average value, RMS value for the sinusoidal waveform?	8M

UNIT-III

5.	a)	Explain the principle operation of DC Motor?	6M
	b)	Derive the EMF equation of a DC generator?	6M
		(OR)	
6.	a)	Describe the speed control of dc motor using Armature circuit resistance?	6M
	b)	A 4-pole lap-connected dc generator has no-load generated e.m.f. of 500 V when driven at 1200 rpm. Calculate the flux per pole if the armature has 120 slots with 6 conductors per slot.	6M

UNIT-IV

7.		Explain the principle operation of Single Phase Transformer and derive the EMF equation.	12M
		(OR)	
8.		Draw and explain a circuit diagram to perform O.C and S.C Tests of Single Phase Transformer.	12M

UNIT-V

9.	a)	Draw and explain torque-speed characteristics of three phase induction motor?	8M
	b)	A 3-phase, 50Hz induction motor has a full-load speed of 1440 r.p.m. For this motor, calculate the following : (i)Number of Poles (ii)Full-Load Slip	4M
		(OR)	
10.	a)	Explain principle of operation of three phase induction motor.	8M
	b)	A 3-phase, 4 poles, 60Hz induction motor has a full-load slip of 4%. For this motor, calculate the Full-Load speed?	4M

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CODE: 18EET102 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Regular/Supplementary Examinations, November-2020

ELECTRIC CIRCUIT THEORY

(Electrical and Electronics Engineering)

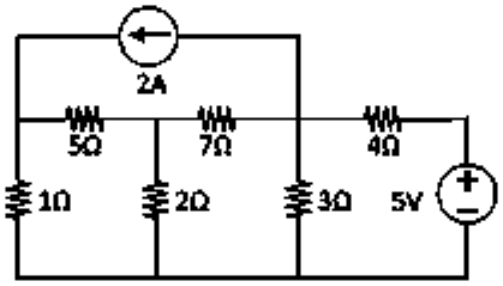
Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Define Capacitor and derive the expression for the energy stored in a capacitor. 4 M

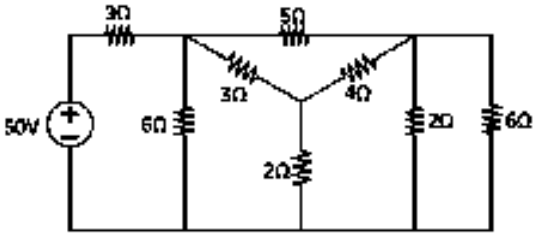
   b) Use node voltage method to find power in 5Ω and 7Ω resistor 8 M



(OR)

2. a) Define Inductor and derive the expression for the energy stored in an inductor. 4 M

   b) Determine the current drawn by the circuit. 8 M



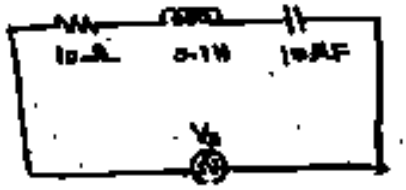
UNIT-II

3. a) Derive the expression for resonant frequency for a series RLC circuit 4M

   b) A series RLC circuit has R=5 Ω, L=40 H, C = 1 F. Calculate, Q factor of the circuit, separation between $(f_2 - f_1)$ and resonant frequency 8 M

(OR)

4. a) Define band width and Q factor 4 M



b) For the circuit shown below determine the impedance at resonant frequency, 10Hz above resonant frequency and 10Hz below the resonant frequency. 8 M

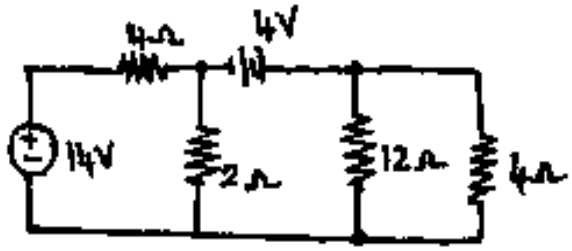
UNIT-III

5. State and explain super position theorem with an example. 12M

(OR)

6. a) State and explain the reciprocity theorem. 4 M

b) Find the voltage drop across 12 Ω resistance Using Norton's theorem for the circuit shown below. 8 M



UNIT-IV

7. State and explain maximum power transfer theorem with an example 12M

(OR)

8. State and explain Tellegen's theorem with an example. 12 M

UNIT-V

9. Derive the relation between line and phase voltages and currents in star connection. 12M

(OR)

10. Show that the total power in a three phase three wire system using the two wattmeter method of measurement is given by the sum of the wattmeter readings. Also derive the expression for power factor of a three phase system using only the wattmeter readings. 12 M

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CODE: 18EST105 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Regular/Supplementary Examinations, November-2020

BASIC ELECTRONICS

(Mechanical Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain the working of p-n diode in forward and reverse bias conditions .	(6M)
	b)	Compare and contrast Zener breakdown and Avalanche breakdown	(6M)

(OR)

2.	a)	Explain the operation of the Full wave rectifier with necessary diagrams	(6M)
	b)	Explain how the zener diode acts as voltage regulator	(6M)

UNIT-II

3.	a)	Explain about input and output characteristics of a transistor when it is connected in common base configuration.	(6M)
	b)	Compare CB,CE,CC configurations	(6M)

(OR)

4.	a)	Explain construction and operation of n channel JFET with neat diagram	(6M)
	b)	What are the differences between BJT and FET	(6M)

UNIT-III

5.		Explain the operation of CE amplifier in detail.	(12M)

(OR)

6.		Draw the AC equivalent circuit of CE amplifier and explain the concepts of coupling and bypass capacitors	(12M)

UNIT-IV

7.	a)	With a neat block diagram explain the operation of current series feedback amplifier	(6M)
	b)	What are the advantages of negative feedback amplifier	(6M)

(OR)

8.	a)	Explain Hartley oscillator using transistor with circuit diagram	(6M)
	b)	Explain the operation of RC phase shift oscillator using circuit diagram	(6M)

UNIT-V

9.	a)	Explain about Op-amp along with block diagram in detail.	(6M)
	b)	Explain virtual ground concept and write the gain expressions of three op_amp configurations	(6M)

(OR)

10.	a)	Define i) CMRR ii) PSRR iii) SlewRate	(6M)
	b)	Draw the Pin configuration of 741 OP-AMP and explain function of each pin	(6M)

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CODE: 18ECT103 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Regular/Supplementary Examinations, November-2020

ELECTRONIC CIRCUITS

(Electronics and Communication Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	With the help of a circuit diagram and wave forms explain the operation of a half wave rectifier.	6M
	b)	A PN junction diode having internal resistance r_f =20 ohms is used for half wave rectification. If the applied voltage is $V=V_m \sin\omega t$ and load resistance is 800 ohms, find a) I_m b) I_{dc} c) I_{rms} d) P_{ac} e) P_{dc} f) efficiency.	6M

(OR)

2.		Derive the expression for average voltage and RMS voltage of a full wave rectifier.	12M

UNIT-II

3.	a)	Describe in detail about what is a C section filter.	8M
	b)	Derive the ripple for C section filter.	4M

(OR)

4.	a)	What is the need for voltage regulation.	4M
	b)	Explain in detail about transistor series regulator.	8M

UNIT-III

5.	a)	Explain the terms thermal runaway, thermal stability and stabilization against variations in base-emitter voltage.	8M
	b)	Explain the need for biasing a transistor.	4M

(OR)

6.		Explain fixed Biasing of a Bipolar Junction Transistor and derive the expression for stability factor.	12M

UNIT-IV

7.		Derive the h-parameter equivalent circuit of transistor in any one configuration.	12M

(OR)

8.	a)	Write the comparison of transistor amplifier configurations	6M
	b)	Draw and brief about various elements of AC equivalent circuit of transistor amplifier.	6M

UNIT-V

9.	a)	Draw and explain the block diagram of current shunt feedback amplifiers.	6M
	b)	How are feedback amplifiers classified? explain	6M

(OR)

10.	a)	Write the differences between positive and negative feedback in amplifiers.	6M
	b)	Write about the effect of feedback on input and output resistances	6M

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