Q.P. Code:20EE0201 **R20**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year II Semester Regular & Supplementary Examinations October-2022

FUNDAMENTALS OF ELECTRICAL CIRCUITS

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

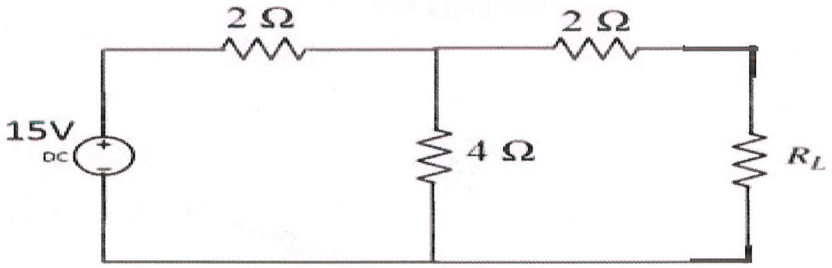
1	a	Explain in detail about passive elements.	L2	6M
	b	Determine the Equivalent Capacitance when two capacitor are connected in Series & Parallel.	L2	6M

OR

2		Derive the relation of voltage and current for pure resistor, inductor& capacitor.	L1	12M

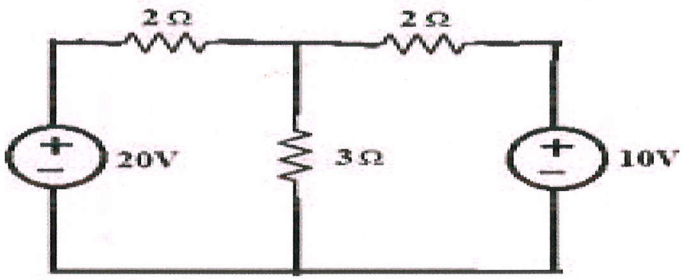
UNIT-II

3	a	State &explain Super position theorem.	L1	4M
	b	Find load current by using Thevenin's theorem for the following circuit where RL =3Ω.	L3	8M



OR

4	a	Verify Tellegen's theorem for the circuit shown in below figure.	L3	6M



	b	State and prove Compensation theorem.	L3	6M

UNIT-III

5	a	Explain about Series resonance with phasor diagrams.	L2	6M
	b	A series RLC circuit has R=10Ω, L=0.1H and C=50μF. The applied voltage is 100V. Find Resonant frequency & Quality factor of a coil.	L4	6M

OR

6	a	Explain about Band-width of parallel resonance.	L2	6M
	b	Explain the importance of resonance and find the condition for series resonance.	L4	6M

UNIT-IV

7	a	Explain self-inductance with expressions.	L1	6M
	b	What is the maximum possible mutual inductance of two inductively coupled coils with self-inductance of 50mH and 200mH?	L2	6M

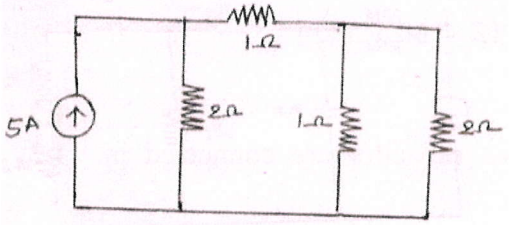
OR

8	**a**	Explain parallel connection of coupled inductors.	**L4**	**6M**
	b	Two inductors whose self-inductances are of 75mH and 55mH respectively are connected together in parallel aiding. Their mutual inductance is given as 22.5mH. Calculate the total inductance of the parallel combination. (i) aiding each other (ii) opposing each other	**L4**	**6M**

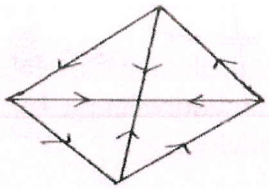
UNIT-V

9		Find the cut-set matrix for the followings.	**L3**	**12M**

i)



ii)



OR

10	**a**	Write the procedure for constructing cut-set matrix.	**L4**	**6M**
	b	Explain the relationship between branch current matrix and loop current matrix.	**L4**	**6M**

*** END ***