O.P.Code: 20EE0201	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year II Semester Regular & Supplementary Examinations August-2023

FUNDAMENTALS OF ELECTRICAL CIRCUITS

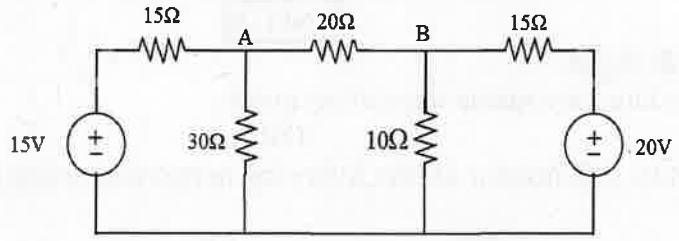
(Electrical and Electronics Engineering)

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

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

UNIT-I

				CO	Level	Marks
1	**a**	Determine the Equivalent Capacitance when two capacitor are connected in Series & Parallel.		**CO1**	**L3**	**6M**
	b	Determine the current in branch A-B by using KVL		**CO1**	**L3**	**6M**

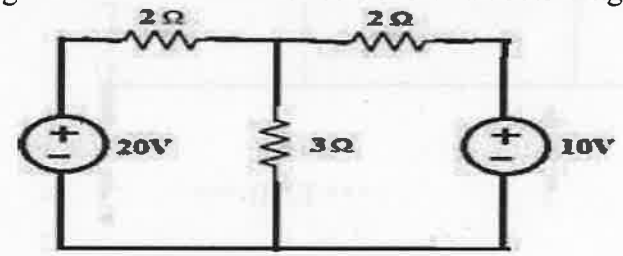


OR

2	**a**	State and explain Ohm's law.		**CO1**	**L2**	**6M**
	b	Derive an expression for RMS values of sine wave form.		**CO1**	**L3**	**6M**

UNIT-II

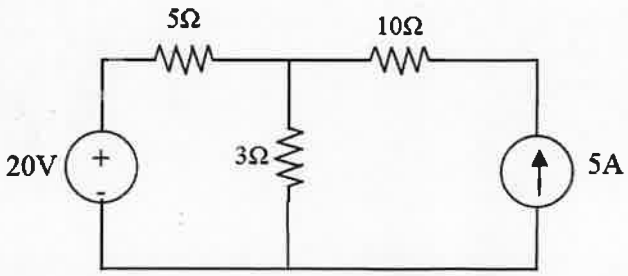
3	**a**	Verify Tellegen's theorem for the circuit shown in below figure.		**CO2**	**L3**	**6M**



	b	State and prove Tellegen's theorem.		**CO2**	**L2**	**6M**

OR

4	**a**	State &explain Norton's theorem.		**CO2**	**L2**	**6M**
	b	By using superposition theorem find the current flowing through the 3-ohm resistor		**CO2**	**L3**	**6M**



UNIT-III

5	**a**	Explain about Series resonance with phasor diagrams.		**CO3**	**L3**	**6M**
	b	Determine the quality factor of coil for the series circuit consisting of R=10Ω, L=0.1H and C=10μF.		**CO3**	**L3**	**6M**

OR

6	**a**	Explain about Quality factor of parallel resonance.		**CO3**	**L3**	**6M**
	b	Explain the importance of resonance and find the condition for series resonance?		**CO3**	**L3**	**6M**

UNIT-IV

7	**a**	Derive the expressions for mutual inductance with expressions.	**CO4**	**L2**	**6M**
	b	A 15mH coil is connected in series with another coil. The total inductance is 70mH. When one of the coils is reversed, the total inductance is 30mH. Find the self-inductance of second coil, mutual inductance and coefficient of coupling.	**CO4**	**L3**	**6M**

OR

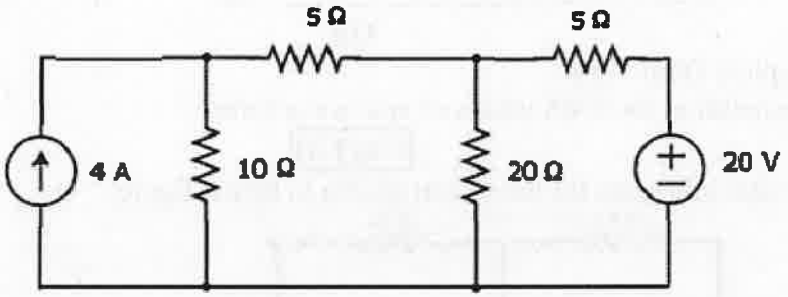
8	**a**	Write the expression for equivalent inductance of two coupled coils connected in series and parallel.	**CO4**	**L2**	**6M**
	b	Two coils connected in series have a self-inductance of 20mH and 60mH respectively. The total inductance of the combination was found to be 100mH. Determine the amount of mutual inductance that exists between the two coils (i) aiding each other (ii) opposing each other.	**CO4**	**L3**	**6M**

UNIT-V

9	**a**	Define cut-set & tie-set.	**CO5**	**L2**	**6M**
	b	Write the procedure for constructing cut-set matrix.	**CO5**	**L3**	**6M**

OR

10		Determine current in 10Ω resistor for the following network by using nodal analysis.	**CO5**	**L4**	**12M**



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