VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade
B.E. (Civil Engg.) I-Semester Main & Backlog Examinations, Jan./Feb.-2024
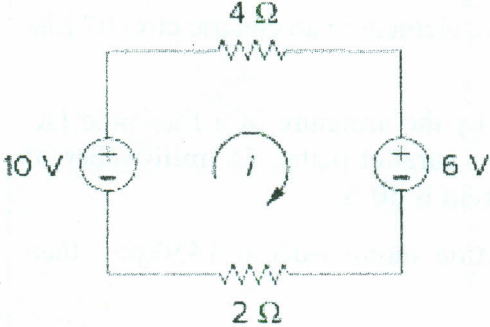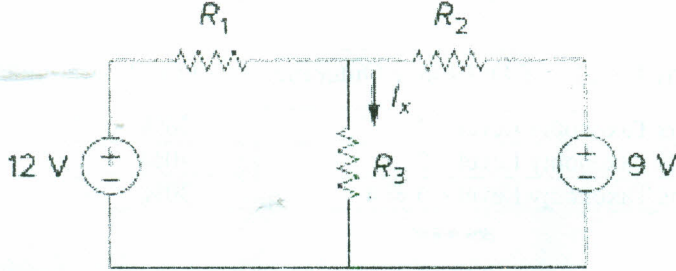### Basic Electrical Engineering for Civil Engineers

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

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	State the KCL & KVL.	2	1	1	1,2
2.	Give the relation between voltage and current in an inductor	2	1	1	1,2
3.	List the advantages of sinusoidal alternating voltage	2	1	1	1,2
4.	In a three phase balanced Star connected system, if the line voltage is 415V, find the phase voltage.	2	1	1	1,2
5.	Give the classification of DC generators.	2	1	2	1,2
6.	Explain the use of Fleming's Left-Hand rule in DC machine.	2	1	2	1,2
7.	Give the slip of induction motor.	2	1	3	1,2
8.	List the applications of Squirrel Cage three phase induction motor.	2	1	3	1,2
9.	Calculate the current i in the circuit shown,	2	3	1	1,2

Q. No.	Stem of the question	M	L	CO	PO
10.	An alternating voltage is given by v = 300sin377t. Determine the peak value and RMS value of the voltage.	2	3	1	1,2

Part-B (5 × 8 = 40 Marks)

Q. No.	Stem of the question	M	L	CO	PO
11. a)	Using nodal analysis, determine current I_x in the circuit shown below with $R_1 = 5\ \Omega$, $R_2 = 10\ \Omega$ and $R_3 = 5\ \Omega$.	5	3	1	1,2

			M	L	CO	PO
	b)	Discuss the terms Node, Junction, & Mesh in an electric circuit.	3	2	1	1,2
12.	a)	A resistance of 10 Ω and capacitor of 50 µF are in series and they are connected across 230 V, 50 Hz supply. Calculate (i) impedance of the circuit (ii) current in the circuit.	5	3	1	1,2
	b)	Give the advantages of three phase ac supply.	3	2	1	1,2
13.	a)	Derive the equation of EMF induced in DC generator.	5	3	2	1,2
	b)	Explain the Fleming's Right-Hand rule used in DC machine.	3	2	2	1,2
14.	a)	Describe the construction of three phase induction motor with necessary diagram.	5	2	3	1,2
	b)	Differentiate between squirrel cage induction motor and slip-ring induction motor.	3	2	3	1,2
15.	a)	Using mesh analysis, determine current through 4 Ω resistor.	5	3	1	1,2

			M	L	CO	PO
	b)	What is an active element & passive element in an electric circuit? List the examples of each element.	3	2	1	1,2
16.	a)	Determine the torque established by the armature of a four pole DC motor having 774 conductors, two parallel paths, 24 milli-weber of flux per pole and the armature current is 50 A.	4	3	2	1,2
	b)	If a 4-pole 50 Hz 3-phase induction motor runs at 1450rpm, then calculate the value of slip?	4	3	3	1,2
17.		Answer any *two* of the following:				
	a)	Describe the procedure of mesh analysis in electrical circuits with suitable example.	4	2	1	1,2
	b)	In series RL circuit, derive the expression for current, impedance, active power consumed and power factor of the circuit.	4	2	1	1,2
	c)	Explain the Armature speed control methods of DC shunt motor in detail.	4	2	2	1,2

M : Marks;   L: Bloom's Taxonomy Level;   CO; Course Outcome;   PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	50%
iii)	Blooms Taxonomy Level – 3 & 4	30%

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