

Hall Ticket Number:

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Code No. : 12036 (A)

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD

B.E. (CBCS) II-Semester Main Examinations, January-2021

Basic Electrical Engineering

(Common to CSE & ECE)

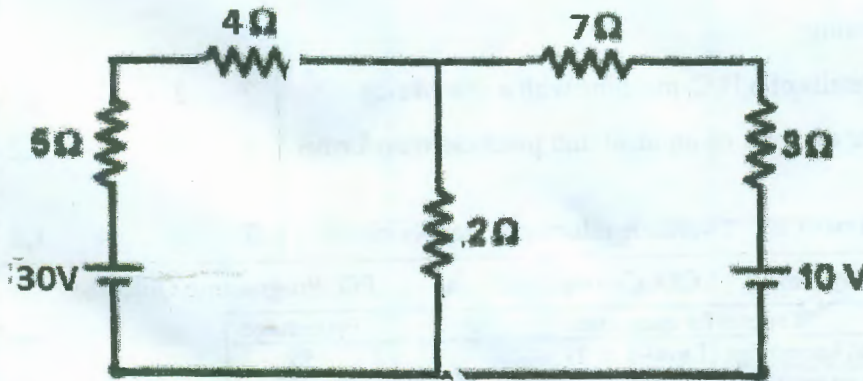
Time: 2 hours

Max. Marks: 60

Note: Answer any NINE questions from Part-A and any THREE from Part-B

Part-A (9 × 2 = 18 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Define Kirchoff's Voltage & Current laws	2	1	1	1,2
2.	List are the active and passive elements in DC circuits	2	1	1	1,2
3.	Interpret active power and reactive power in an AC circuit	2	2	1	1,2
4.	Define Form Factor and Peak Factor in an AC circuits	2	1	1	1,2
5.	Why brushes in DC machine are made with Carbon?	2	2	2	1,2
6.	Classify DC machines based on excitation	2	1	2	1,2
7.	Compare Miniature Circuit Breaker (MCB) and Switch Fuse Unit (SFU)	2	4	3	1,2
8.	What are the assumptions considered for an ideal transformer?	2	1	3	1,2
9.	Draw the torque-slip characteristics of a three phase induction motor	2	2	4	1,2
10.	Give the classification of stepper motors based on construction	2	1	4	1,2
11.	State the super position theorem	2	2	1	1,2
12.	Explain RMS value in an AC circuit	2	2	1	1,2
<i>Part-B (3 × 14 = 42 Marks)</i>					
13. a)	Calculate the current passing through the 2 ohm resistor in the given circuit.	7	3	1	1,2



b)	Using source transformation, solve the power delivered by 10V voltage source in the figure shown below	7	3	1	1,2
14. a)	Derive the expression for the impedance, current and complex power in a RLC series circuit	7	3	1	1,2
b)	In an AC circuit, $v = 200 \sin(\omega t + 30^\circ)$ V, $i = 15 \sin(\omega t - 30^\circ)$ A. Calculate the reactive power in the circuit.	7	3	1	1,2
15. a)	Write the terminal voltage equations for different types of DC motors	7	2	2	1,2
b)	A 220 V D.C shunt motor runs at 1400 RPM on no-load, drawing an armature current of 3 A from the supply. Solve the motor speed for an armature current of 60 A. It is given that $R_a = 0.24$ ohms and $R_f = 110$ ohms.	7	3	2	1,2
16. a)	Explain about power factor improvement methods in an electrical system	7	2	3	1,2
b)	A single phase transformer with a ratio of 440/110V takes a no-load current of 5A at 0.2 p.f lagging. If the secondary draws a current of 120A on load at 0.8 p.f lagging, calculate the primary current	7	3	3	1,2
17. a)	Explain the production of rotating magnetic field in three phase induction motor	7	2	4	1,2
b)	Describe the construction and working of BLDC motor with a neat schematic diagram	7	2	4	1,2
18. a)	State and explain the maximum power transfer theorem with a suitable example	7	2	1	1,2
b)	In a series RC circuit, the values of $R = 200 \Omega$ and $C = 10 \mu F$. A sinusoidal voltage of 50 kHz is applied and the voltage across the capacitance is 4.5V. Calculate the voltage across the resistor and active power consumed by the circuit.	7	3	1	1,2
19.	Answer any <i>two</i> of the following:				
a)	Explain the constructional details of a D.C. machine with a neat sketch	7	2	2	1,2
b)	Draw and explain the phasor diagram of an ideal and practical transformer under no-load condition	7	4	3	1,2
c)	Discuss the construction and working of variable reluctance stepper motor	7	2	4	1,2

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

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	55
2	Knowledge on application and analysis (Level-3 & 4)	45
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable,)	0