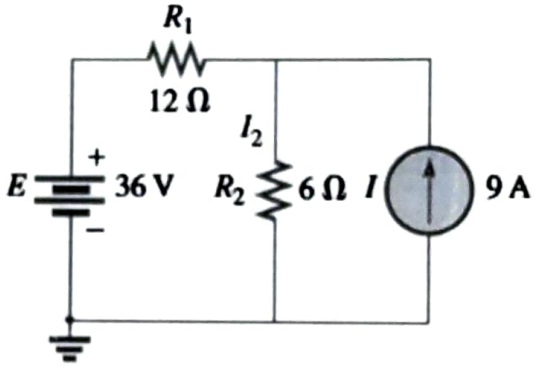
Roll No. | | | | | | | | | | |

COER University

END SEMESTER EXAMINATION, EVEN SEM 2022-23

Time : 3 hours **Total Marks** : 100
Program Name : B.TECH (CSE, AI&ML, Cyber Security) **Semester** : II
Course Name : Basics of Electrical Engineering **Course Code** : BTCS202/SOE102

Note: All questions are compulsory. No student is allowed to leave the examination hall before the completion of the time.

Q. No 1	Attempt Any Four Parts. Each Question Carries 5 Marks.	CO	BL
(a)	State and Explain Thevenin's theorem.	CO 1	2
(b)	Explain how voltage source with a source resistance can be converted into an equivalent current source.	CO 1	3
(c)	Using the superposition theorem, determine the current through resistor R_2 for the network below 	CO 1	3
(d)	List the steps for obtaining Norton's equivalent circuit.	CO 1	2
(e)	Define Power in Electrical Circuit.	CO 1	1

Q. No 2	Attempt Any Four Parts. Each Question Carries 5 Marks.	CO	BL
(a)	Explain Analysis of single-phase ac circuits consisting of R.L combinations (series and parallel) circuit.	CO 2	2
(b)	Explain and compare MCB and MCCB.	CO 2	2
(c)	Define: Peak and RMS values.	CO 2	1
(d)	The equation of alternating voltage is given by $v = 325.22\ sin314t$. Find (i) Maximum value (ii) Angular frequency (iii) RMS value (iv) Frequency (v) Average value.	CO 2	3
(e)	Draw power triangle and show various quantities on it.	CO 2	2

Q. No 3	Attempt Any Four Parts. Each Question Carries 5 Marks.	CO	BL
(a)	Explain E.M.F equation of transformer.	CO 3	3
(b)	Derive the condition for maximum efficiency.	CO 3	1
(c)	Explain what you understand by the efficiency of a transformer. Deduce the condition for the maximum efficiency.	CO 3	1
(d)	Draw the no-load phasor diagram of a transformer. Express the magnetizing current and the core-loss current in terms of the no-load current and the power factor.	CO 3	3
(e)	A transformer is rated at 100kVA. At full load copper loss is 1200W and its iron loss is 960W.calculate. (1) The efficiency at full load at unity pf. (2) The efficiency at half load and 0.8 pf	CO 3	3

Q. No 4	Attempt Any Two Parts. Each Question Carries 10 Marks.	CO	BL
(a)	A 110 V D.C shunt generator delivers a load current of 50A. the armature resistance is 0.2 ohm and field resistance is 55 ohm . The generator is rotating at a speed of 1800 rpm has 6 pole LAP wound, and a total of 360 conductors. calculate: (1) voltage at armature (2) the flux per pole	CO 4	3
(b)	A 500-V, dc shunt motor takes 4 A on no load and runs at 1000 rpm. The armature resistance (including that of the brushes) is 0.2 Ω, and the field current is 1 A. On loading, if the motor takes a current of 100 A, determine its speed and estimate the efficiency at which it is working.	CO 4	3
(c)	Give the line and phase relationship for voltages and currents for star connected and delta connected 3 – phase network.	CO 4	1

Q. No 5	Attempt Any Two Parts. Each Question Carries 10 Marks.	CO	BL
(a)	Write Application of Single and three phase induction motor.	CO 5	1
(b)	Explain construction & working Principal of stepper motor	CO 5	3
(c)	Name three types of stepper motors and comment on their constructional differences. What are the main features of stepper motor which are responsible for its wide spread use? Give some applications of stepper motor.	CO 5	1

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