

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025***Third Semester**Electrical and Electronics Engineering***UEET24303 - Electrical Machines - I***Regulations - 2024**Duration : 3 Hrs**Maximum : 100 Marks***PART - A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

<i>Q.No</i>	<i>Questions</i>	<i>BTL</i>	<i>CO</i>	<i>Marks</i>
1.	Mention the effect of fringing flux in magnetic circuit.	L1	1	2
2.	Sketch the Flow of energy in Electro-mechanical energy conversion via a coupling field.	L1	1	2
3.	What is armature reaction? Mention their effects.	L2	2	2
4.	What is the purpose of compensating winding in DC machine?	L2	2	2
5.	State Fleming's rule for motor action.	L1	3	2
6.	State the conditions for maximum efficiency in DC motor.	L1	3	2
7.	Draw the equivalent circuit model and phasor diagram of single-phase transformer.	L1	4	2
8.	Define voltage regulation of a single-phase transformer.	L1	4	2
9.	Compare and contrast auto-transformer and two winding transformers.	L2	5	2
10.	Which type of transformer connection is suitable for distribution transformers? Why?	L4	5	2

PART - B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i Describe the nature of emf induced in a magnetic circuit with a neat diagram.	L2	1	6
	ii Explain the concept of Electro-mechanical energy conversion and obtain the expression for field energy and co-energy.	L2	1	10
	Or			
	b i Derive the expression for mechanical force developed in a magnetic field system for a current excited system.	L2	1	6
	ii Obtain the expression for torque developed in a singly excited magnetic field system in terms of (i) exciting current (ii) flux density.	L2	1	10
12.	a i Explain the principle of operation of DC Generator with a neat circuit diagram.	L2	2	8
	ii From the first principle, obtain the EMF induced in a DC Generator.	L2	2	8

Or

	b	i	Describe the methods of improving commutation in DC machine.	L2	2	8
		ii	Explain the open circuit and load characteristics of self-excited DC shunt Generator.	L2	2	8
13.	a	i	Explain the principle of operation of DC shunt motor with a neat circuit diagram.	L2	3	8
		ii	Describe various methods of speed control of DC shunt motor with a neat circuit.	L2	3	8
			Or			
	b	i	Explain about no-load test and obtain the expression for efficiency of a DC Motor.	L2	3	8
		ii	How efficiency of a DC series motor is determined? Explain with a neat diagram.	L2	3	8
14.	a	i	Describe the construction and working principle of Single-phase transformer with a neat diagram.	L2	4	8
		ii	From the first principles, obtain the EMF equation of a Single-phase transformer.	L2	4	8
			Or			
	b	i	Obtain the expressions for magnetic losses occurs in a single-phase transformer core.	L2	4	8
		ii	Describe the essential conditions for parallel operation of single-phase transformer. Also mention the effects, if the conditions are not satisfied.	L2	4	8
15.	a	i	Describe the construction and working principle of Auto-transformer with a neat diagram.	L2	5	10
		ii	Illustrate the applications of auto-transformer.	L2	5	6
			Or			
	b	i	Describe the constructional features of three-phase transformer.	L2	5	10
		ii	Show the Scott connection of three phase transformer, and mention the applications of Scott connection.	L2	5	6