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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FOURTH SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017

Course Code: EE216

Course Name: ELECTRICAL ENGINEERING (AE)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions. Each question carries 15 marks

1	a)	Derive the EMF equation for a Single-phase transformer.	(5)
	b)	What is an ideal transformer? Draw it's no load phasor diagram.	(5)
	c)	Explain the working principle and construction of an autotransformer.	(5)
2	a)	Explain reactance voltage in the case of a DC machine.	(5)
	b)	What are the various losses occurring in a DC machine? Mention the methods to reduce them.	(5)
	c)	Why the compensating windings and inter-poles are provided in a dc machine?	(5)
3	a)	A 10 kVA, 200/400 V, 50 Hz single phase transformer gave the following test results. OC test (HV winding open): 200 V 1.3 A 120 W SC test (LV winding short circuited): 22 V 30 A 200 W Find all the parameters of equivalent circuit as referred to LV winding.	(10)
	b)	Draw the power flow diagram of a DC generator.	(5)

PART B

Answer any two full questions. Each question carries 15 marks

4	a)	How is back emf produced in a DC motor? Also derive an expression for this emf.	(5)
	b)	A 4 pole 220 V shunt motor has 540 lap wound conductors. It takes 32 A from supply mains and develop an output power of 5.595 kW. The field winding takes 1A. Armature resistance is 0.9 Ω and flux per pole is 0.03 Wb. Calculate the torque developed in Nm.	(5)
	c)	What are the advantages and disadvantages of Swinburne's test?	(5)
5	a)	Why synchronous motors are not self-starting?	(5)
	b)	A 4 pole 50 Hz star connected alternator has flux per pole of 0.12 Wb. It has 4 slots per pole per phase, conductors per slot being 4. If the winding coil span is 150^0. Find out the emf.	(5)
	c)	Why does an induction motor never run at synchronous speed?	(5)
6	a)	Explain the thyristor control of series motor.	(8)
	b)	State and explain the various starting methods of a three-phase induction motor.	(7)

PART C

Answer any two full questions. Each question carries 20 marks

7	a)	Draw the torque-speed and torque-slip characteristics of a three-phase induction motor and clearly indicate the effect of change in rotor resistance.	(10)

	b)	With connection diagram, explain a capacitor start single phase induction motor and capacitor run single phase induction motor.	(10)
8	a)	Compare moving iron and moving coil type instruments.	(5)
	b)	How is the current range of a PMMC instrument extended with the help of shunts?	(8)
	c)	Describe the constructional details of a single-phase induction type energy meter.	(7)
9	a)	Name three different types of stepper motors and comment on their constructional differences.	(10)
	b)	Explain the working of a DC slide wire potentiometer and how is it standardized?	(10)

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