APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

08 PALAKKAD CLUSTER

08EE6232-2-April18   (pages: 2)   Name:

Reg No:

SECOND SEMESTER M.TECH. DEGREE EXAMINATION MAY 2017

ELECTRICAL & ELECTRONICS ENGINEERING

08EE6232 ADVANCED ELECTRIC DRIVES

Time:3 hours   Max.marks: 60

Answer all six questions. Part 'a' of each question is compulsory.

Answer either part 'b' or part 'c' of each question

Q.no.	Module 1	Marks
1.a	Explain the concept of Reference frame theory.	3
	Answer b or c	
b	Derive the dynamic d-q modelling of 3ϕ synchronous machine.	6
c	An IM has the following properties. 5 hp, star connected, 3ph, 60 Hz, 4 poles, 200V, $R_s = 0.277$ Ω, $R_r = 0.183$ Ω, $L_m = 0.0538$ H, $L_r = 0.05606$ H, $L_s = 0.0553$ H. The motor is supplied with its rated and balanced voltages. Find d and q axes steady state currents using stator reference frame model.	6

Q.no.	Module 2	Marks
2.a	What are the advantages of vector control of IM?	3
	Answer b or c	
b	With a neat block diagram explain the direct rotor flux oriented vector control scheme for a 3Φ induction motor.	6
c	An IM with the following data is used with an indirect vector controller. 5 hp, star connected, 3ph, 60 Hz, 4 poles, 200V $R_s = 0.277$ Ω, $R_r = 0.183$ Ω, $L_m = 0.0538$ H, $L_r = 0.05606$ H, $L_s = 0.0553$ H, Rated speed = 1766.9 rpm. Find the rated rotor flux linkage and torque command.	6

Q.no.	Module 3	Marks
3.a	What is meant by Parameter sensitivity effects?	3

Answer b or c

b	Explain the concept of field weakening of IM with relevant expressions.	6
c	Explain any one parameter compensation method for vector controlled IM.	6

Q.no.	Module 4	Marks
4.a	What are the different speed control methods for IM drive?	3
	Answer b or c	
b	With neat phasor diagram explain the concept of static Kramer drive.	6
c	With neat diagram explain the subsynchronous and supersynchronous modes of Static Scherbius drive.	6

Q.no.	Module 5	Marks
5.a	What are the advantages of Direct Torque control over Field oriented control?	4
	Answer b or c	
b	Explain the concept of Space Vector Modulation.	8
c	With neat block diagram explain the Direct Torque Control scheme of IM.	8

Q.no.	Module 6	Marks
6.a	Explain the working principle of BLDC Motor.	4
	Answer b or c	
b	With neat phasor diagram explain the vector control scheme of PMSM.	8
c	With neat block diagram explain the drive scheme for SRM.	8