Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

Course Code: EE311

Course Name: ELECTRICAL DRIVES & CONTROL FOR AUTOMATION

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any three full questions, each carries 10 marks.

			Marks
1	a)	A 6 pole DC shunt generator has 780 wave connected armature conductors and running at 600 r.p.m supplies a load of 13Ω resistance at a terminal voltage of 240V.The armature resistance is 0.3Ω and field resistance is 260Ω.Calculate the i)induced EMF ii)Flux per pole	(4)
	b)	Derive the e.m.f equation of a dc generator	(4)
	c)	Explain the working principle of a dc generator	(2)
2	a)	What is armature reaction in a dc generator what are its effects	(6)
	b)	Explain the different characteristics of self-excited dc shunt generator	(4)
3	a)	What are the applications of shunt ,series and compound motors	(3)
	b)	A 6 pole 600V wave connected shunt motor has 1200 armature conductors and useful flux per pole of 22mWb. The armature and field resistances are 0.75 Ω and 250Ω respectively. Calculate the speed and armature torque developed by the motor when it draws 25A from the supply mains. If the magnetic and mechanical losses amount to 920watt.find the i)shaft torque ii)output power in KW and iii) efficiency at this load	(7)
4	a)	What is the purpose of using starter in a dc motor	(2)
	b)	Explain the different characteristics of dc shunt motor, series motor and compound motor.	(8)

PART B

Answer any three full questions, each carries 10 marks.

5	a)	Explain with diagram the principle of operation of a single phase transformer	(4)
	b)	Explain with diagram the working of potential transformer and current transformer	(6)

6	a)	By conducting Open Circuit and Short Circuit tests derive the equivalent circuit of a single phase transformer	(7)
	b)	What are the losses present in a single phase transformer	(3)
7	a)	By conducting no load and blocked rotor test write the procedure to draw the circle diagram of a three phase induction motor	(8)
	b)	What is the significance of the term slip of an induction motor	(2)
8	a)	Explain how rotating magnetic field is produced in a three phase induction motor. Also prove that its magnitude of resultant flux is constant at different angles.	(10)

PART C

Answer any four full questions, each carries 10 marks.

9	a)	Explain how regulation of alternator is conducted by EMF Method	(10)
10	a)	What is a synchronous condenser	(3)
	b)	Explain the V curves of a synchronous motor	(3)
	c)	What are the methods of starting synchronous motors	(4)
11	a)	Explain double field revolving theory of a single phase induction motor	(4)
	b)	Explain with diagram the Working of a capacitor start induction motor	(5)
	c)	What are the applications of capacitor start induction motors	(1)
12	a)	Explain with diagram the working of a multi stack variable reluctance stepper motor	(6)
	b)	Explain the principle of operation of a stepper motor	(4)
13	a)	Explain the with block diagram the working of open loop and closed loop control of a stepper motor	(6)
	b)	What are the applications of stepper motors	(2)
	c)	What are the applications of programmable logic controller	(2)
14	a)	Explain the working of a digital controller used for Automation	(5)
	b)	Explain the applications of axis controller and machine tool controller in Industrial Automation	(5)

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