Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (S,FE) Examination December 2025 (2019 Scheme)

Course Code: RAT304

Course Name: ELECTRIC DRIVES AND CONTROL

Max. Marks: 100 **Duration: 3 Hours**

PART A

Answer all questions, each carries 3 marks. Marks

1		List the starting methods of dc motors.	(3)
2		Compare BLDC and normal dc motors.	(3)
3		Summarise the types of firing in SCRs.	(3)
4		Sketch the RC triggering circuit for SCR.	(3)
5		Distinguish continuous and discontinuous conduction methods.	(3)
6		Brief the concept of freewheeling diodes.	(3)
7		Describe voltage control in inverters.	(3)
8		Identify the advantages of PWM inverters.	(3)
9		List the benefits of drives in motor control.	(3)
10		Identify sensor-less control in PMSM.	(3)

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

11	a)	With neat diagrams, explain the mechanism of the drive system in motor control. Also, illustrate the process.	(14)

OR

12	a)	Describe the types of servo motors.	(10)
	b)	Explain the selection criteria of motors.	(4)

Module II

13	a)	With neat graphs, outline the VI and switching characteristics of thyristors.	(14)

OR

14	a)	Explain the gate protection circuits.	(6)
	b)	Summarise the types of isolation circuits in SCR control systems.	(8)

Module III

15	a)	Explain with diagrams and graphs, explain class E choppers.	(14)

OR

16 a) With the diagram, describe the 3 phase controlled rectifier. (10)

b) Write a short note on armature control of DC motor drives. (4)

Module IV

17 a) Outline the concept of pulse width modulation and brief single pulse width, multiple pulse width & sine PWM with necessary graphs. (14)

OR

18 a) Explain with diagrams and graphs, a three-phase bridge inverter with 120° conduction mode. (14)

Module V

19 a) Identify the position control of servo system. (4)

b) Outline microcontroller-based synchronous motor drives. (10)

OR

20 a) Paraphrase the concept, Sizing of servomotors. (7)

b) Illustrate speed control of the BLDC motor. (7)

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