Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth Semester B.Tech Degree Regular Examination June 2023 (2019 Scheme)

Course Code: MRT434

Course Name: SPECIAL ELECTRICAL MACHINES AND APPLICATION

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

PART A

Answer all questions, each carries 3 marks. Marks

1	Define the following terms as applied to a Stepper motor (1) Start-stop mode (2) Slewing mode	(3)
2	List out the applications of stepper motor?	(3)
3	Explain Servomechanism, what is the role of feedback device in a servo motor system?	(3)
4	Write a short note on series split field DC servomotor	(3)
5	Draw torque - slip characteristics of induction generator.	(3)
6	What are the advantages and disadvantages of universal motor	(3)
7	What are the applications of BLDC motor	(3)
8	Compare electronic and mechanical commutation	(3)
9	Draw the characteristics of repulsion motor	(3)
10	What are the different arrangements of permanent magnets in Permanent Magnet Synchronous motor	(3)

PART B

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

Module I

11.	a)	With neat figure explain the characteristics of stepper motor	(6)
	b)	Explain in detail about stepper motor drive circuits.	(8)

OR

12.	a)	Explain the construction of a Variable Reluctance Stepper motor	(10)
	b)	What is the relationship between the step angle and the number of steps per revolution in a stepper motor? Explain each term	(4)

Module II

13. a) With relevant diagrams explain armature-controlled DC Servomotors (9)

    b) Compare the performance of AC and DC servo motors (5)

OR

14. a) Explain the construction of AC servomotor (10)

    b) Enumerate the features of DC servo motor. List two applications of DC servo motors. (4)

Module III

15. a) Explain the equivalent circuit of induction generator (8)

    b) Describe the principle of operation of induction generator (6)

OR

16. a) What are the advantages & limitations of the universal motor (6)

    b) Explain the characteristics and application of universal motor. (8)

Module IV

17. a) With a neat figure describe the construction, working and characteristics of BLDC motor (14)

OR

18. a) Discuss about voltage source inverter fed BLDC motor (8)

    b) Explain principle of operation of a BLDC motor (6)

Module V

19. a) With a neat figure explain the construction of repulsion motor (9)

    b) What are the advantages of repulsion motors (5)

OR

20. a) Explain in detail the principle of operation of hysteresis motor (8)

    b) Discuss about the characteristics of reluctance motor (6)

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