Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S3 (S,FE) Examination December 2025 (2019 Scheme)

Course Code: MRT201

Course Name: ELECTRICAL MACHINES & DRIVES

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions. Each question carries 3 marks Marks

1	Describe the conditions for voltage build up in DC shunt generator	(3)
2	Explain working principle of DC motor	(3)
3	Compare core type and shell type transformers	(3)
4	What are the different types of starting methods in three phase induction motor	(3)
5	Briefly explain the construction of split phase induction motor	(3)
6	Derive emf equation of alternator	(3)
7	Explain working of motor used for precise position control	(3)
8	Sketch V-I characteristics of SCR	(3)
9	State essential parts of electrical drive. Also write fundamental torque equation	(3)
10	Define active and passive load torque	(3)

PART B

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

Module 1

11	Explain different types of dc generators with a neat circuit diagram and necessary equations.	(14)

12 With neat sketches explain the working of four point starters. What are the functions of no volt coil and overload relay coil? (14)

Module 2

13 Explain the concept of an ideal transformer. Also describe open circuit and short circuit test for transformer with neat circuit diagram and necessary equations. (14)

14 Define slip. How rotating magnetic field is produced whenever three phase ac is fed to three phase induction motor (14)

Module 3

15 Explain double field revolving theory of single phase induction motor. Sketch torque-slip characteristics. (14)

16 In a 50 KVA, star connected, 440V three phase 50Hz alternator, the effective armature resistance is 0.25 ohm per phase. The synchronous reactance is 3.2 ohm per phase and leakage reactance is 0.5 ohm per phase. Determine at rated load and unity power factor (14)

(a) Internal emf. (b) No load emf. (c) Percentage regulation on full load (d) value of synchronous reactance which replaces armature reaction.

Module 4

17 Explain construction and working of different types of stepper motor (14)

18 Write a short note on a single phase fully controlled bridge rectifier with R Load. Derive equation for average load voltage. (14)

Module 5

19 (a) Explain the concept of steady state stability with examples (10)

(b)Compare group drive, individual drive and multi motor drives. (4)

20 Explain methods of speed control of three phase induction motor (14)

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