

C 1064

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Name

Reg. No.

EIGHTH SEMESTER B.TECH. [ENGINEERING] (09 SCHEME) DEGREE EXAMINATION, APRIL 2016

EE/PTEE 09 804 L06—SPECIAL ELECTRICAL MACHINES

Time : Three Hours

Maximum : 70 Marks

Part A

Answer all questions.

1. Define pull in torque and pull out torque.
2. Draw the torque speed characteristics of Switched Reluctance Motor.
3. Write down the emf equation of a brushless permanent magnet square wave motor.
4. What are the applications of permanent magnet synchronous motors ?
5. Write the torque equation of a permanent magnet synchronous motor.

(5 × 2 = 10 marks)

Part B

Answer any four questions.

6. Write a short note on the dynamic characteristics of a stepper motor.
7. What are the different modes of excitation used in VR motor ?
8. What is the step angle of a 3 phase SRM with 12 stator poles and 8 rotor poles ? What is the commutation frequency in each phase at 6000 rpm speed ?
9. Draw the magnetic equivalent circuit of a two pole permanent magnet brushless DC motor.
10. Discuss the use of hall effect sensors for position sensing in permanent magnet brushless DC motors.
11. Draw and explain briefly the torque speed characteristics of a permanent magnet synchronous motor.

(4 × 5 = 20 marks)

Part C

Answer all questions

12. With neat diagrams explain the construction and operation of variable reluctance stepping motor.

Or

13. Explain in detail any one power driver circuit of a stepper motor drive system.
14. Derive the voltage and torque equations of Switched Reluctance Motor.

Or

15. Discuss the constructional features of axial and radial air gap synchronous reluctance motors.

Turn over

16. Explain the construction and principle of operation of a permanent magnet brushless DC motor.

Or

17. Discuss the use of microprocessors for controlling a brushless DC motor with the help of neat block diagram.

18. Derive the emf equation and torque equation of a permanent magnet synchronous motor.

Or

19. With relevant diagrams explain the concept of vector control of permanent magnet synchronous motor.

(4 × 10 = 40 marks)