

C 21447

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Name.....

Reg. No.....

**EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
APRIL 2017**

EE/PTEE 09 804 L06—SPECIAL ELECTRICAL MACHINES

(2009 Admissions)

Time : Three Hours

Maximum : 70 Marks

Part A

Answer all questions.

1. Name different configuration used for switching the phase windings of a stepping motor.
2. Calculate the stepping angle for a 3 stack 16 tooth variable reluctance motor.
3. Explain double saliency of switched reluctance motor.
4. Name *two* types of brushless d.c. machine.
5. Write down the input power equation and torque equation of permanent magnet synchronous motor.

(5 × 2 = 10 marks)

Part B

Answer any four questions.

6. Explain an open loop controller for a 2-phase stepping motor.
7. Write the suitability and areas of application of stepping motor.
8. Write down distinctive differences between switched reluctance and conventional reluctance motors.
9. Explain the control of switched reluctance motor for traction type load.
10. Draw and explain basic configuration of brushless d.c. motor.
11. Differentiate between brushless d.c. motor and permanent magnet synchronous motor.

(4 × 5 = 20 marks)

Part C

12. Explain the construction and working of hybrid stepper motor with a neat diagram.

Or

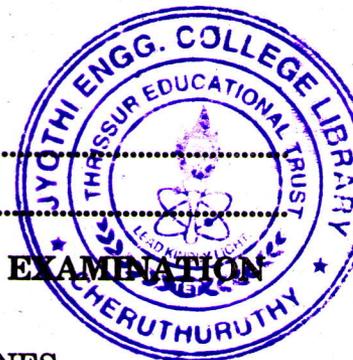
13. Explain the voltage current relations and torque expressions of a stepper motor.

14. Explain the operation of power converter for switched reluctance motor.

Or

15. Explain some design aspects of stator and rotor pole arc in switched reluctance motor.

Turn over



16. Derive the torque and e.m.f. equation and explain the torque speed characteristics of permanent magnet brushless d.c. motor.

Or

17. With the help of a neat diagram explain the constructional details and working principle of brushless d.c. motor.
18. Describe self control, vector control and current control schemes used in permanent magnet synchronous motor.

Or

19. Explain the constructional details and working principle of permanent magnet synchronous motor with the aid of a neat diagram.

(4 × 10 = 40 marks)