Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 71786

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Seventh Semester

Electrical and Electronics Engineering

EE 6703 — SPECIAL ELECTRICAL MACHINES

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the types of rotor available in synchronous reluctance motor?

2. What are the applications of synchronous reluctance motor?

3. Draw the equivalent circuit of winding in stepper motor.

4. What are the applications of stepper motor?

5. Define energy ratio.

6. Draw the Torque — Speed characteristics of SRM.

7. What is electronic commutator?

8. Write the EMF equation of a P.M. Brushless D.C Motor?

9. What are the types of materials used in permanent magnet motor?

10. What is self control in PMSM?

PART B — (5 × 16 = 80 marks)

11. (a) Explain the working principle and construction details of different types of Synchronous reluctance motor. (16)

Or

(b) (i) Derive the torque equation of a Synchronous Reluctance motor and draw the Torque- Angle characteristic. (8)

(ii) Derive the expression for d-axis synchronous reactance of a permanent magnet Synchronous reluctance motor. (8)

12. (a) Describe construction and working of variable reluctance stepper motor with neat diagram. (16)

Or

(b) (i) Explain in detail the power driver circuits of stepper motor. (10)

(ii) Write in detail the microprocessor based closed loop operation of stepper motor. (6)

13. (a) (i) Explain in detail the power controllers for switched reluctance motor. (10)

(ii) Explain the role of microprocessors in control of switched reluctance motor.

Or

(b) (i) Describe the construction and working principle of SRM. (12)

(ii) What are the applications and advantages of SRM? (4)

14. (a) Derive the emf and torque equation of a Brushless permanent magnet square wave motor. (16)

Or

(b) Explain the construction of PMBLDC motor also compare conventional dc motor and PMBLDC motor. (16)

15. (a) Describe the construction and performance of PMSM with neat diagram. (16)

Or

(b) Derive the emf and torque equation of a Brushless permanent magnet since wave DC motor. (16)
