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Reg. No. :

Question Paper Code : 50495

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 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. Compare synchronous reluctance motor and induction motor.

2. Classify the different types of synchronous reluctance motor.

3. Name the various modes of excitation in stepper motor.

4. Distinguish the half step and full step operations of a stepper motor.

5. Illustrate the different modes of operation of switched reluctance motor.

6. Give the advantages of sensorless operation of switched reluctance motor.

7. What is the principle of operation of PMBLDC motor.

8. Write down the torque equation of PMBLDC motor.

9. What are the types of PMSM ?

10. State the power controllers for PM synchronous machines.

PART – B   (5×16=80 Marks)

11. a) i) Discuss in detail about the construction and working of synchronous reluctance motor with neat diagrams.   (8)

   ii) Draw and explain phasor diagram with characteristics of synchronous reluctance motor.   (8)

(OR)

   b) Describe the constructional features and operation of variable reluctance synchronous reluctance motor.   (16)

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12. a) Draw and explain the drive circuits and their performance characteristics for stepper motor. **(16)**

(OR)

   b) With a neat block diagram explain microprocessor control of stepper motor. **(16)**

13. a) Explain with a neat circuit any two configuration of power converters used for the control of switched reluctance motor. **(16)**

(OR)

   b) Explain with a neat diagram the constructional details and working of rotary switched reluctance motor. **(16)**

14. a) Discuss in detail about magnetic circuit analysis of PMBLDC motor. Also draw its characteristics. **(16)**

(OR)

   b) Prove that the torque equation in BLDC motor is similar to that of conventional DC motor. **(16)**

15. a) Derive the expression for power input and torque of a PMSM. Explain how its torque speed characteristics is obtained. **(16)**

(OR)

   b) Explain the construction and working principle of operation of PMSM. **(16)**