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# Question Paper Code : X10380

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2021
Sixth Semester
Electrical and Electronics Engineering
EE 8005 – SPECIAL ELECTRICAL MACHINES
(Regulations 2017)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. Define step angle.
2. Define holding torque as referred to stepper motor.
3. Give the expression for torque of switched reluctance motor.
4. What are the applications of switched reluctance motor ?
5. Compare PMBLDC with PMSM.
6. List out different classifications of BLPM DC motor.
7. Define load angle.
8. What is meant by self-control in PMSM ?
9. What is Hysteresis motor ?
10. Show some potential applications of synchronous reluctance motor.

PART – B **(5×13=65 Marks)**

11. a) Draw and explain in detail the static and dynamic characteristics of stepper motor.

(OR)

b) Explain the operation of single stack and multi stack stepper motor with a neat diagram.

12. a) State the principle of operation of switched reluctance motor.

(OR)

b) Differentiate switched reluctance motor and variable reluctance stepper motor and short notes on C-Dump circuit.

13. a) Derive and expression for permeance coefficient of PMBLDC motor and write its advantages over conventional DC motor.

(OR)

b) Write a note on power controllers used for PMBLDC motor and explain the each block associated in it.

14. a) With necessary diagrams, discuss about various power controllers used for PMSM.

(OR)

b) With a neat sketch explain the microprocessor based speed control of PMSM.

15. a) Differentiate between axial and radial air gap synchronous reluctance motors. Compare performance of synchronous reluctance motor with switched reluctance motor.

(OR)

b) Summarize the design considerations of synchronous reluctance motor.

PART – C **(1×15=15 Marks)**

16. a) Design a suitable driver circuit which employs unipolar and bipolar wiring arrangements of stepping motor and explain.

(OR)

b) Derive the torque equation of switched reluctance motor and show it is independent of direction of current.

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