Total No. of Questions : 11]

SEAT No. :

P3592

[Total No. of Pages : 2

[4959]-1064

B.E. (Electrical)

SPECIAL PURPOSE MACHINES

(2012 Pattern) (Elective - I)

Time : 2½ Hours]   *[Max. Marks : 70*

Instructions to the candidates:

   1)   *Solve 6 questions Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10 & 11 is compulsory.*

   2)   *Neat diagrams must be drawn wherever necessary.*

   3)   *Figures to the right indicate full marks.*

   4)   *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*

   5)   *Assume suitable data, if necessary.*

Q1)   Obtain magnetic force and torque from co-energy.   **[7]**

OR

Q2)   Derive the relationship for energy stored singly excited magnetic system. **[7]**

Q3)   What are the differences between sinusoidal PMSM and trapezoidal PMSM?
                                                                                        [7]

OR

Q4)   Explain process of electronic commutation in PMSM.   **[7]**

Q5)   Explain with block diagram constant torque angle operation of PMSM.   **[6]**

OR

Q6)   Explain block diagram of field oriented control of PMSM machine.   **[6]**

Q7)   a)   Explain different operational characteristic and constructional features of synchronous reluctance machine.   **[8]**

        b)   With block diagram explain control of reluctance motor.   **[8]**

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OR

Q8) a) Obtain mathematical expressions for static and dynamic torque production in reluctance machine. **[8]**

b) Discuss selection of number of poles and pole arc in switched reluctance machine. **[8]**

Q9) a) Explain operation of VRM and PM type stepper motors. **[9]**

b) Derive equation for mechanical torque produced in VRM stepping motor. **[9]**

OR

Q10) a) With block diagram explain control of stepping motor by using micro stepping method. **[9]**

b) Explain various applications of stepper motors. **[9]**

Q11) Solve any two of the following : **[16]**

a) Explain process of torque production in linear induction motor.

b) Explain various important characteristics of linear induction machine.

c) Explain different types of linear Induction motors with their construction.

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