SEAT No. :

P1968

[Total No. of Pages : 2

[4859]-1028

B.E. (Electrical) (Semester - I)

Special Purpose Machines

(Elective - I(a)) (2012 Pattern)

Time : 2.30 Hours]   *[Max. Marks : 70*

Instructions to the candidates:

   1)   *All questions are compulsory.*

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

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

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

   5)   *Assume suitable data if necessary.*

Q1) How to calculate torque from energy stored in magnetic circuit?   **[7]**

OR

Q2) Explain process of calculation of torque developed in systems employing permanent magnets.   **[7]**

Q3) Explain characteristics features of brushless dc motor. What way it is different from permanent magnet synchronous machine?   **[7]**

OR

Q4) Explain different constructions of PMSM machines. Which configuration is most common?   **[7]**

Q5) Explain in detailed abc to $\alpha\beta$ transformation. Also state assumptions made.**[6]**

OR

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

Q7) a) Explain different configurations of reluctance machine.   **[8]**

     b) Derive torque equation for generalized reluctance synchronous motor. State the assumptions made in derivation.   **[8]**

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<div align="center">OR</div>

Q8) a) Explain torque production in plain reluctance motor. Also explain process of pull into synchronism. Draw relevant characteristics. **[8]**

b) Explain switched reluctance drive. Draw necessary waveforms. **[8]**

Q9) a) Explain with neat diagrams, different types of stepper motors. **[9]**

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

<div align="center">OR</div>

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

b) Explain steady state operation of stepping motor by using constant current drive. **[9]**

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

a) Explain concept of magnetic levitation. How it is useful in operation of linear induction machine applications.

b) Explain various important characteristics of linear induction machine.

c) Discuss various applications of linear induction machine.

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