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SEAT No. :

P227

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Oct./BE/Insem. - 543

B.E. (Electrical)

SPECIAL PURPOSE MACHINES

(2015 Course) (Semester - I) (403144 (E)) (Elective - II)

Time : 1 Hour]

[Max. Marks :30

Instructions to the candidates:

- 1) *Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Assume Suitable data if necessary.*

Q1) a) How principle of conservation of energy is used for modelling machine modelling? **[5]**

b) What is co-energy? How it is differ from energy stored in magnetic circuit? **[5]**

OR

Q2) Derive mathematical expression for force and torque from co-energy. **[10]**

Q3) Explain and compare following types of permanent magnet brushless motors **[10]**

- a) Trapezoidal brushless motor
- b) Sinusoidal brushless motor

OR

Q4) Derive the relation of torque generated in brushless D.C. motor and hence draw torque speed characteristics. **[10]**

Q5) Explain the concept of $abc - \alpha\beta$ and $\alpha\beta - dq$ transformations as used in machine modeling. **[10]**

OR

Q6) Explain the FoC scheme of constant $\delta = 90$ with the help of phasor diagram and block diagram. **[10]**