Code No: **R164102G** **R16** **Set No. 1**

IV B.Tech I Semester Supplementary Examinations, July/Aug – 2021

SPECIAL ELECTRICAL MACHINES

(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1. a) Explain the term magnequench w.r.t permanent magnetic materials. [2]
   b) Differentiate between a stepper motor and a conventional motor. [2]
   c) Explain the significance of Hysteresis current control. [2]
   d) An electric motor contains coils and magnets and the flux is fixed in magnitude. Can the flux-linkage of any coil vary? [3]
   e) Explain the term magnet alignment torque w.r.t Sine wave permanent magnet brushless motor. [2]
   f) What are the advantages of linear motors compared with induction motors? [3]

PART–B *(4x14 = 56 Marks)*

2. a) Explain the various magnetic properties that are considered which are obtained from suppliers data sheet of magnetic materials [7]
   b) Explain in detail about the Temperature effects: reversible and Irreversible losses in magnetic materials [7]

3. a) Explain the construction and working of Hybrid Stepper motor [7]
   b) Find the resolution of a stepper motor that is to be operated at an input pulse frequency of 6000 pulse/sec and travel a distance of 180^0 in 0.025 sec. [7]

4. a) Explain the construction and principle of working of Switched reluctance motor with a neat block diagram. [7]
   b) List the advantages, disadvantages and applications of SRM. [7]

5. a) Derive the torque equation of the BLDC Motor [7]
   b) Explain the working of BLDC motor with 180^0 magnet arcs and 120^0 square – wave phase currents. [7]

6. a) Distinguish between Square wave permanent magnet brushless DC motor and Sine wave permanent magnet brushless DC motor [7]
   b) Draw and explain the Torque – Speed characteristic of Sine wave permanent magnet Brushless motor. [7]

7. a) Explain the principle and working of an linear induction Motor [7]
   b) Explain the factors to be considered while choosing specific electric and magnetic loadings of linear Induction Motor. [7]