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

IV B.Tech I Semester Advanced Supplementary Examinations, May - 2022

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) Write the role of permanent magnet in the motors? [3]
   b) How the stator mmf was shifted to new position in a stepper motor? [3]
   c) What are the step angles obtained in a switched reluctance motor? [2]
   d) Write the short notes on the efficiency of permanent magnet brush less DC motor? [2]
   e) List out the outcomes of circle diagram of permanent magnet brush less motor? [2]
   f) Write the role of rotor iron in double sided linear induction motor? [2]

PART–B *(4x14 = 56 Marks)*

2. a) Draw and explain the B-H curves of common permanent magnet materials? [7]
   b) Discuss the operating temperature range of permanent magnet DC motors? [7]

3. a) Explain how a three phase, 2 pole synchronous motor is used as stepper motor? [7]
   b) Write the applications of three phase variable reluctance stepper motor? [7]

4. a) Discuss the conditions to be satisfied in the operation of a switched reluctance motor? [7]
   b) Explain the idealized L-Θ profile of switched reluctance motor? [7]

5. a) Derive the emf equation of permanent magnet brush less DC motor? [7]
   b) Explain the torque-speed characteristics of permanent magnet brush less DC motor? [7]

6. a) Derive the torque equation of sine wave permanent magnet brush less motor? [7]
   b) Discuss where the sine wave permanent magnet brush less DC motor is used in the electrical applications? [7]

7. a) Draw and explain the schematic diagram of linear induction motor drive for electric traction? [7]
   b) Explain the operation of belt conveyor with two linear induction motors with neat diagram? [7]