



Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S8 (R,S) Exam April 2025 (2019 Scheme)

Course Code: EET426**Course Name: SPECIAL ELECTRIC MACHINES****Max. Marks: 100****Duration: 3 Hours****PART A***Answer all questions, each carries 3 marks.*

Marks

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| 1 | Explain the working principle of a PMDC motor. | (3) |
| 2 | List any three applications of PMSM. | (3) |
| 3 | Explain monofilar and bifilar windings. | (3) |
| 4 | What is step angle? Derive the equation for step angle. | (3) |
| 5 | What are the advantages of Synchronous Reluctance Motors? | (3) |
| 6 | Why do we require a position sensor for the operation of an SRM? | (3) |
| 7 | List three requirements to be satisfied by a good servomotor. | (3) |
| 8 | Explain the principle of operation of an AC Servomotor. | (3) |
| 9 | What are the advantages of LIMs. | (3) |
| 10 | Explain the modifications to be done in a DC series motor so as to operate satisfactorily on AC supply. | (3) |

PART B*Answer any one full question from each module, each carries 14 marks.***Module I**

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| 11 | a) With neat diagrams, explain the principle of operation of BLDC motors. List three applications of BLDC motor. | (10) |
| | b) Compare BLDC motor and conventional DC motor | (4) |
| OR | | |
| 12 | a) How are permanent magnets magnetized? Differentiate axial and parallel magnetizations. | (6) |
| | b) .Explain with block diagram the self-control scheme for permanent magnet synchronous motor | (8) |

Module II

- 13 a) Explain the construction and working of a Hybrid stepper motor. (10)
b) List the advantages and applications of hybrid stepper motor. (4)

OR

- 14 a) Explain closed loop control of stepper motors. (8)
b) Compare constructional differences between variable reluctance and permanent magnet stepper motors with diagram. (6)

Module III

- 15 a) Derive the torque equation of a switched reluctance motor. (7)
b) Explain the constructional details of a synchronous reluctance motors. (7)

OR

- 16 a) Explain the power converter circuit used for a Switched reluctance motor having bifilar windings. (7)
b) With a block diagram explain a control scheme for SRM. (7)

Module IV

- 17 a) Derive the transfer function of an armature-controlled DC Servomotor and represent it in block diagram. (8)
b) Explain the constructional features of a drag cup servomotor. (6)

OR

- 18 a) Compare AC and DC servomotors. (5)
b) With relevant diagrams explain series split field DC Servomotors. List the differences between armature- controlled and field- controlled DC servomotors (9)

Module V

- 19 a) Give the constructional details of universal motors. List any four applications of it (6)
b) Explain the construction and working of a repulsion motor (8)

OR

- 20 a) Classify LSMs. With the aid of necessary diagrams explain any two types of LSMs (10)
b) Explain the working of a hysteresis motor (4)
