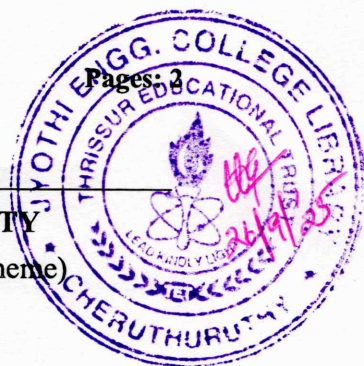


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S8 (S) Examination September 2025 (2019 Scheme)



Course Code: MRT434

Course Name: SPECIAL ELECTRICAL MACHINES AND APPLICATION

Max. Marks: 100

Duration: 3 Hours

PART A*Answer all questions, each carries 3 marks.*

Marks

- | | | |
|----|---|-----|
| 1 | List out few comparisons between Permanent Magnet and Variable Reluctance stepper motors? | (3) |
| 2 | Define Step Angle? Give brief Explanation? | (3) |
| 3 | Briefly explain the principle of operation of DC servomotor? | (3) |
| 4 | What are the applications of DC and AC servomotor? | (3) |
| 5 | What are the applications of induction generators? | (3) |
| 6 | Draw torque - slip characteristics of induction generator? | (3) |
| 7 | What is brushless and brushed motors? | (3) |
| 8 | What is mean by electrical and mechanical commutation? | (3) |
| 9 | What are the disadvantages of repulsion motor? | (3) |
| 10 | Draw the torque-speed characteristics of synchronous reluctance motor? | (3) |

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

- | | | |
|----|--|------|
| 11 | a) What do you mean by stepper motor? Explain construction and working principle of variable reluctance stepper motor? | (14) |
|----|--|------|

OR

- | | | |
|----|--|------|
| 12 | a) With neat figure explain the construction and working of hybrid type stepper motor? | (10) |
| | b) Explain the characteristics of Stepper Motor? | (4) |

Module II

- | | | |
|----|---|------|
| 13 | a) Explain Damped AC servomotor? | (10) |
| | b) Sketch the characteristics of AC servomotor? | (4) |

OR

- | | | |
|----|---|------|
| 14 | a) With relevant diagrams explain Drag cup Servomotors? | (10) |
|----|---|------|

- b) Explain characteristics of DC servomotor? (4)

Module III

- 15 a) Describe about the construction and working of universal motor with suitable diagram? (10)
b) Describe the principle of operation of induction generator? (4)

OR

- 16 a) Draw the phasor diagram of Induction Generator and explain? (8)
b) List the advantages and disadvantages of Induction Generator? (6)

Module IV

- 17 a) Discuss about voltage source inverter fed BLDC motor? (10)
b) Write the advantages and disadvantages of Brushless DC Motors? (4)

OR

- 18 a) With a neat figure describe the construction and operation of BLDC motor? (10)
b) List out few applications of BLDC motor? (4)

Module V

- 19 a) Explain the construction and working of hysteresis motor with a neat diagram? (10)
b) Discuss about Speed-Torque Characteristics of Hysteresis motor? (4)

OR

- 20 a) With a neat figure explain the principle of operation of repulsion motor? (7)
b) Draw & explain the characteristics of repulsion motor? (7)
