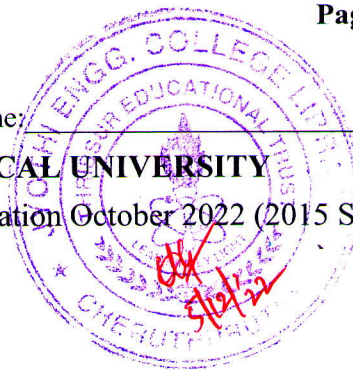


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth Semester B.Tech Degree Supplementary Examination October 2022 (2015 Scheme)

**Course Code: EE402****Course Name: Special Electrical Machines**

Max. Marks: 100

Duration: 3 Hours

PART A*Answer all questions, each carries 5 marks.*

Marks

- | | | |
|---|--|-----|
| 1 | What is meant by Servo motors? Explain a DC Servo motor. What are the basic features of Servo motors that helps to achieve good dynamic response | (5) |
| 2 | Define step angle and detent torque in Stepper motors. | (5) |
| 3 | Can we use DC series motor in AC supply? If so explain the modifications required to work satisfactorily in ac supply. | (5) |
| 4 | Describe any one power converter circuit for Switched Reluctance motor. | (5) |
| 5 | Give the constructional details of a Permanent Magnet DC Motor | (5) |
| 6 | Differentiate between trapezoidal type BLDC motor and sinusoidal type BLDC motor. | (5) |
| 7 | Explain the operation of any one type of Linear Synchronous motor. | (5) |
| 8 | List the applications of Linear Induction motor. | (5) |

PART B*Answer any two full questions, each carries 10 marks.*

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|----|--|------|
| 9 | a) Draw and explain torque speed characteristics of AC Servomotor for different values of control voltage. | (5) |
| | b) Enumerate features of AC Servomotor. List four applications of AC Servomotor. | (5) |
| 10 | a) Explain series split field DC Servomotors with necessary diagram. | (5) |
| | b) Sketch and explain static and dynamic characteristics of Stepper motors. | (5) |
| 11 | Describe the working of Variable Reluctance Stepper motor in two phase on mode with relevant sketches. | (10) |

PART C*Answer any two full questions, each carries 10 marks.*

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| 12 | a) (i) What is an AC series motor? Explain with any one application. | (5) |
| | (ii) Develop the phasor diagram of AC series motor. | |
| | b) What are the advantages and limitations of Universal motor. | (5) |

- 13 a) Derive the torque equation of Hysteresis motor. (5)
b) Name two rotor position sensing schemes used in the operation of Switched Reluctance Motor. Discuss them in detail. (5)
- 14 Derive the torque equation of SRM. Also list four applications of SRM. (10)

PART D

Answer any two full questions, each carries 10 marks.

- 15 a) Explain the operation of BLDC motor with relevant sketches. Give any two applications of BLDC motors. (10)
- 16 a) Compare Electronic commutation and mechanical commutation. (5)
b) Explain the working of a Linear Reluctance Motor. (5)
- 17 a) Explain the principle of operation of Linear Induction Motor. (5)
b) Develop the equivalent circuit of Linear Induction Motor. (5)
