Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code: U1502

M.E. DEGREE EXAMINATION, APRIL 2024

First Semester

Power Electronics and Drives

21PPE102– MODELING AND ANALYSIS OF ELECTRICAL MACHINES

(Regulations 2019)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

1. (a) Develop the Voltage and torque equations of DC machine   CO1- U   (20)

Or

    (b) Explain the basic concepts of Rotating machine.   CO1- U   (20)

2. (a) Derive induction motor modelling in rotor flux and stator flux   CO2- U   (20)
         reference frame.

Or

    (b) Write short notes on Reference-frame theory , Commonly used   CO2- U   (20)
         reference frames & Transformation between reference frames.

3. (a) Derive the voltage equation in arbitrary reference for synchronous   CO3- App   (20)
         machine.

Or

    (b) Explain Generalized theory of rotating electrical machine and   CO3- U   (20)
         Kron's primitive machine.

4. (a) Analyze the dynamic modeling of synchronous machine   CO4- Ana   (20)

Or

    (b) Draw the equivalent circuits of a 2-phase unsymmetrical induction   CO4- App   (20)
         machine using voltage equations in stationary reference-frame
         variables.

5. (a) Derive Voltage and torque equation of surface mount permanent   CO5- Ana   (20)
       magnet machine in rotor reference frame.

                                      Or

   (b) Explain the dynamic analysis of Switched Reluctance Motors   CO5- U   (20)

U1502