QPC: RJ20MTECH013 AR 19 Reg. No | | | | | | | | | | |

GIET UNIVERSITY, GUNUPUR – 765022

M. Tech (First Semester – Regular) Examinations, June – 2021

MPCPE1010– ELEECTRIC DRIVE SYSTEM

(Power Electronics)

Time: 3 hrs Maximum: 50 Marks

The figures in the right hand margin indicate marks.

PART – A **(2 x 10 = 20 Marks)**

Q1. Answer **ALL** questions

a. What is meant by dynamics of electric drive?

b. What is meant by Passive load torque?

c. How various speed transitions can be classified?

d. What is a DC motor drive?

e. What is the duty cycle of a chopper ?

f. Explain principle operation of poly phase induction machine?

g. Draw the equivalent circuit model of poly phase induction machine?

h. Explain about stator and rotor windings of poly phase induction machine?

i. Explain starting procedure of traction motor?

j. What are the Requirements of ideal traction system?

PART – B **(6x 5 = 30 Marks)**

Answer ***ANY FIVE*** questions **Marks**

2. Explain fundamental torque equation for an Electric drive system? **(6)**

3. Explain Load torque requirements with different examples? **(6)**

4. Explain armature voltage control method of speed control? **(6)**

5. A 250-V separately excited motor de has an armature resistance of 2.5 ohm. When driving a load at 600 rpm with constant torque, the armature takes 20 A. This motor is controlled by a chopper circuit with a frequency of 400 Hz and an input voltage of 250 V. **(6)**

   i) What should be the value of the duty ratio if one desires to reduce the speed from 600 to 400 rpm, with the load torque maintained constant?

   ii) What should be the minimum value of the armature inductance, if the maximum armature current ripple expressed as a percentage of the rated current is not to exceed 10 percent?

6. Explain procedure to derive the Dynamic modelling of induction machines with neat explanation? **(6)**

7. Explain stator voltage control scheme under power circuit and gating, reversible controller? **(6)**

8. Explain the procedure for Analysis Of Quadrilateral Speed–Time Curve? **(6)**

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