School of Electrical Electronics and Communication Engineering

Electrical Engineering
ETE - Jun 2023

Time : 3 Hours **Marks : 50**

SEM VI - BTEE4001 - ELECTRIC DRIVES

Your answer should be specific to the question asked
Draw neat labeled diagrams wherever necessary

1.	Discuss constant torque and constant power operation DC motors.	K2 CO3	(2)
2.	Illustrate 4-quadrant operation of 1-phase dual converter DC motor drive.	K2 CO4	(2)
3.	Determine the different load torque components.	K1 CO1	(2)
4.	Derive the motor thermal model for heating/cooling.	K1 CO2	(2)
5.	Explain slip speed control of induction motor.	K2 CO5	(2)
6.	Determine the components of load torques and their classification based on speed torque characteristic.	K3 CO2	(5)
7.	Determine the speed-torque relation and the speed-torque characteristic for three-phase induction motor.	K4 CO6	(6)
8.	Find the equilibrium speed and calculate the steady state stability when motor and load torque are T = -1-2wm and Tl = - 3(wm^0.5) respectively.	K3 CO1	(5)
9.	Illustrate with appopriate figures speed control of separately excited DC motor using three-phase semi-converter and three-phase full converter.	K5 CO4	(8)
10.	A SEDC motor operating from a 1-phase semi-converter with speed of 1400rpm has input voltage 330sin314t and back emf 80V. Every half cycle, the thyristors are triggered at 30 degrees. Armature resistance is 4 ohms. Calculate the average armature current and motor torque.	K5 CO5	(8)
11.	A motor with two loads has one load having rotational motion coupled to motor with a gear having a=0.2 and efficiency 95%. The load has moment of inertia and load torque of 5 kgm2 and 20 N-m respectively. The second load has weight of 500 kg to be lifted at a speed of 1m/sec. The coupling efficiency is 90%. The motor inertia is 0.5 kgm2 and motor speed is 960 rpm. Calculate equivalent inertia referred to the shaft and the motor power.	K4 CO3	(8)