Reg No:										
---------	--	--	--	--	--	--	--	--	--	--



Manipal Institute of Technology, Manipal



(A Constituent Institute of Manipal University)

VI SEMESTER B.TECH MECHTRONICS ENGG. DEGREE EXAMINATION MAY/JUNE 2017

SUBJECT: ELECTRIC DRIVE MTE 3201

REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ANY FIVE FULL the questions.
- ✤ Missing data may be suitable assumed.

1 A.	A 200 V DC shunt motor runs at its normal speed of 500 rpm, when armature		
	current is 20 A. The resistance in the armature circuit is 0.5Ω . Calculate the		
	speed when the flux is reduced to 40 % of its original while the load takes 7.5	5 m	
	A current.		
1 B .	Sketch and describe the speed torque characteristics of a DC Series Motor.		
	Mention some applications	3 m	
1C.	Explain the ways in which the speed of the DC series motor can be controlled.	2 m	
2 A.	A separately excited dc motor is used to drive a conveyor belt. The speed of		
	the conveyor belt needs to be varied. The available electrical supply is 230V		
	50Hz Single Phase AC. Identify the converter to interface the supply to the		
	motor. Draw the circuit diagram. Explain how speed variation can be	5 m	
	achieved.		
2 B.	A dc series motor fed from a 220 V dc source through a chopper has		
	parameters $Ra = 0.5 \Omega$ and $Rs = 0.3\Omega$, $Ke = 1.5 Vs/rad$ and the load current		
	current is 12 A. For a chopper of 30% duty cycle,		
	i. Determine the motor speed and the torque.	5 m	
	ii. Explain the working of the chopper used with the help of circuit diagram	U III	
	and waveforms of load voltage and load current.		
3 A.	Explain how the supply frequency can be controlled to control the speed of	2	
	Three Phase Induction Motor.	2 m	

3 B.	Explain the Power Converter used in Qn 3 A.	3 m		
3 C.	A hoist load while lifting down the load has to regulate the developed torque	fting down the load has to regulate the developed torque		
	(braking) to work against the gravity. If a squirrel cage induction motor is			
	used, describe any two methods that can be implemented in the process			
4 A.	A weight of 500Kg is being lifted up at a uniform speed of 1.5m/s by a winch			
	driven by a motor running at 1000rpm. The moment of inertia of motor and			
	winch are 0.5 and 0.3kg-m ² respectively.			
	i. Calculate the motor torque, equivalent moment of inertia referred to the			
	motor shaft and the power delivered by the motor. In the absence of weight,	5 m		
	motor develops a torque of 100Nm when running at 1000rpm.			
	ii. State the condition of steady state stability of the motor drive system.			
4 B.	Explain the four quadrant operation, with respect to the motor-drive system.	5 m		
5 A.	Compare a BLDC motor and Brushed DC motor.	5 m		
5 B.	Explain the working of a Linear Induction Motor. Explain one of its	_		
	application	5 m		