Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

Course: Electrical Drives **Semester: VI**
Program: B.tech. Electrical **Time : 03 hrs.**
Course Code: EPEG 3012 **Max. Marks:100**
Instructions:

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	What do you understand by soft start? Name the soft start methods employed for induction motors.	**4**	**CO2**
Q.2	Why DC motor should not be employed on lightly loaded or no-loaded conditions?	**4**	**CO1**
Q.3	State the advantages of the Electrical Drives.	**4**	**CO1**
Q.4	Describe the components of the load torque.	**4**	**CO1**
Q.5	Which DC drive is known as constant speed drives? Justify your answer.	**4**	**CO1**
	SECTION B **(4Qx10M= 40 Marks)**		
Q.6	Illustrate the power flow diagram for induction motor and derive the expression for rotor efficiency.	**10**	**CO3**
Q.7	A 220 V, 1200 rpm, 15A separately excited motor has armature resistance and inductance of 1.8 ohm and 32mH respectively. This motor is controlled by a single phase fully controlled rectifier with an ac source voltage of 230 V, 50Hz. Identify the modes and calculate speed for: (a) $\alpha = 45^0$ and torque = 40 N-m (b) $\alpha = 45^0$ and torque = 10 N-m	**10**	**CO4**
Q.8	A 220 V, 24 A, 100 rpm, separately excited dc motor has an armature resistance of 2ohm. Motor is controlled by a chopper with frequency of 500Hz and source voltage of 230V. Calculate the duty ratio for 1.2	**10**	**CO3**

	times rated torque and 500 rpm.		
Q.9	Explain the stator voltage control scheme to control the speed of induction motors and discuss its merits and demerits.	**10**	**CO2**
	SECTION-C **(2Qx20M=40 Marks)**		
Q .10	A 230V, 1000rpm, 30A separately excited motor has armature resistance and inductance of 0.7 ohm and 50mH respectively. Motor is controlled in regenerative braking by a chopper operating at 800Hz from a dc source of 230 V. assuming continuous conduction (i) Calculate duty ratio of chopper for rated torque and the speed of 800 rpm. (ii) What will be the motor speed for duty ratio of 0.6 and rated motor torque? (iii) What will be the maximum allowable speed of motor, if chopper has a maximum duty ratio of 0.9 and maximum allowable motor current is twice the rated current? (iv) Calculate power fed to the source for operating conditions in (iii)	**20**	**CO3**
Q. 11	Explain the advantages of frequency-controlled induction motor. Why is the V/f ratio kept constant? draw the power circuit diagram and plot the torque slip curves. **OR** Explain the slip power recovery system for induction motor drive. Also illustrate the Scherbius drive method for slip power recovery.	**20**	**CO4**