

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Sem Examination, Dec 2021

Course: Advanced Drives and Controllers for eV

Programme: B.Tech Electrical Engineering

Course Code: EPEG 4016

Semester: VII

Max Marks:100

Duration : 3 Hrs.

S. No.		Marks	CO
	Section A		
	Short Answer Question. Each Question carries 5 marks		
Q.1	Fill in the Blanks: a) The motors used for eVs should create (High/Moderate) starting torque. b) DC motors are discouraged in eVs due to (brushes/field system) c) In case of eVs, IC engine of conventional vehicles is replaced by _____	2+1+1	CO1
Q.2	Which drag do not affect the performance of eVs at Starting.	4	CO2
Q.3	With respect to PE control of Electric motors mention True or False A) DC motor speed control is achieved by Armature Voltage control only. B) In Second quadrant, DC motor works in forward motoring mode. C) PWM based inverters Eliminates . D) The induction motor speed can be controlled by varying the frequency.	1*4	CO3
Q.4	In BLDC motors, the air gap flux is resultant effect of _____?	4	CO2
Q.5	What is fundamental logic of 'Vector Control of Induction Motor'?	4	CO3
	Section B		
	Each Question carries 10 marks		
Q.1	Explain the challenges and solutions associated to Charging Infra for eVs.	10	CO3
Q.2	Explain the speed control technique of BLDC motors. OR With neat diagram explain the construction of BLDC motors.	10	CO2
Q.3	With neat diagram, describe the construction of SRM?	10	CO2
Q.4	Enumerate the full Drive circuit for FoC of Induction motors?	10	CO3
	Section 'C'		
	Long Answer Question (20 Marks)		
Q 1	Develop the mathematical modelling for FoC of Induction for one of the phase only. OR Develop the mathematical modelling of BLDC motors for one of the phase only.	20 M	CO4
Q 2	a. Enumerate the ideal power drive characteristics of vehicles and also explain the suitability of Electric motors to meet the ideal characteristics. b. Justify the need and focus of mathematical modelling for electric motors?	10 M 10 M	CO1