Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–VIII • EXAMINATION – SUMMER • 2014

Subject Code: X 80903 **Date: 02-06-2014**

Subject Name: Electrical Drives and Traction

Time:10:30 am - 01:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	What are the advantages and disadvantages of d.c. motors when compared with ac motors?	**07**
	(b)	A 220 V d.c. series motor takes an armature current of 20A at 800 rpm. Calculate the speed if a diverter 0.4 ohm is connected in parallel with series field and the motor current remains 20A. Armature resistance 0.5 ohm; series field resistance 0.2 ohm. Assume linear magnetization characteristics.	**07**
Q.2	**(a)**	Giving suitable justifications explain which type of electric motor could be used for the following applications: (1) Crane (2) Textile and paper mills (3) Lathe machine (4) Ship propulsion	**07**
	(b)	Explain plugging and regenerative breaking. Also mention difference between them.	**07**
		OR	
	(b)	Write technical note on heating and cooling curves.	**07**
Q.3	**(a)**	Discuss various speed control methods of three phase induction motor in brief.	**07**
	(b)	Write technical note on “Load equalization and flywheel”.	**07**
		OR	
Q.3	**(a)**	Discuss major factors to be considered while selecting an electric drive.	**07**
	(b)	Explain torque speed characteristics of a three phase induction motor.	**07**
Q.4	**(a)**	Discuss advantages of electric traction.	**07**
	(b)	Sketch typical speed time curves for city service and suburban services.	**07**
		OR	
Q.4	**(a)**	A suburban electric train has a maximum speed of 65 km/hour. The schedule speed including a station stop of 30 sec is 43.5 km/hour. If the acceleration is 1.3 km/hour/sec , find the value of retardation when the average distance between stops is 3 km.	**07**
	(b)	Derive an expression of specific energy output on level track using a simplified speed –time curve.	**07**
Q.5	**(a)**	Explain why series motor is considered to be most suitable for traction work? Elaborate your answer.	**07**
	(b)	Write note on current collection devises.	**07**
		OR	
Q.5	**(a)**	Discuss merits and demerits of d.c. and single phase a.c. systems for the main and the suburban line electrification of the railways.	**07**
	(b)	Explain series parallel starting of d.c. series traction motors.	**07**

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