Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER 2013

Subject Code: 150906 Date: 23-05-2013

Subject Name: Electrical Power Utilization 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 is electrical drive? Explain the advantages and disadvantages of electrical drives.	**07**
	(b)	State the methods of speed control of three phase induction motor and explain speed control of slip ring induction motor with neat diagram.	**07**
Q.2	**(a)**	A 250 volt d.c. shunt motor has armature resistance of 0.25 ohm, on load it takes an armature current of 50 Amp and runs at 750 r.p.m. If the flux of motor is reduced by 10% without changing the load torque, find the new speed of the motor.	**07**
	(b)	Explain the different characteristics of the d.c. series motor.	**07**
		OR	
	(b)	Explain the manually operated star delta starter of 3-phase induction motor.	**07**
Q.3	**(a)**	Define average speed ,crest speed and schedule speed and discuss the factors which affect schedule speed of a train	**07**
	(b)	An electrical train accelerate uniformly form rest to a speed of 50 kmph in 25 sec. it then coasts for 1 minute 10 sec against a constant resistance of 70 N per tonne and is break to rest at 4 kmphps in 10 sec. calculate the scheduled speed, if the station stops are of 15 sec duration.	**07**
		OR	
Q.3	**(a)**	State the main requirements for an ideal traction system. Give merits and demerits of electric traction over steam engine traction.	**07**
	(b)	A train is required to run between two stations 1.6 km apart at an average speed of 40 kmph. The run is to make to simplified quadrilateral speed-time curve. If the maximum speed is to be limited to 64 kmph, acceleration to 2 kmphps and coasting and braking retardations to 0.16 kmphps and 3.2 kmphps respectively, determine the duration of acceleration, coasting and braking.	**07**
Q.4	**(a)**	State and explain square law of illumination.	**07**
	(b)	Explain different types of resistance welding.	**07**
		OR	
Q.4	**(a)**	Explain fluorescent lamp with diagram.	**07**
	(b)	Describe with help of neat sketches various types of electric arc welding in detail.	**07**
Q.5	**(a)**	Explain direct and indirect heating using arc furnace.	**07**

(b) The illumination of drawing office 30 m × 10 m is to have a value of 250 lux and is to be provided by number of 300 watt filament lamps. If the utilization factor is 0.4 and depreciation factor is 0.9, determine the number of lamps required. The efficiency of each lamp is 14 lumens per watt. **07**

OR

Q.5 **(a)** Explain power supply for electrolysis processes. **07**

(b) Explain induction heating. **07**

****