Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII EXAMINATION – SUMMER 2016

Subject Code:180902 **Date:05/05/2016**

Subject Name:Electrical Power Utilization

Time:10:30 AM to 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)**	Explain electric drive using block diagram? What are the various factors which decide the choice of an electric drive for industrial application?	**07**
	(b)	A 400 V, star connected, 3-ϕ, 6-pole, 50 Hz induction motor has following parameters referred to the stator: Rs = Rr' = 1Ω, Xs = Xr' = 2Ω. Calculate initial braking current. What resistance must be inserted in rotor circuit to reduce the maximum braking current to 1.5 times full load current for plugging braking? What will be initial braking torque now?	**07**
Q.2	**(a)**	State the methods of speed control of three phase induction motor and explain any one method in detail.	**07**
	(b)	A motor fitted with a flywheel supplies a load of torque 900 Nm for 2 seconds. During No-load period the flywheel regains its original speed. The motor torque is required to be limited to 450 Nm. The no-load speed of the motor is 500 rpm and full load slip is 10percent. Determine the moment of inertia of the flywheel.	**07**
		OR	
	(b)	Derive expression for heating curve for temperature rise of motor.	**07**
Q.3	**(a)**	Draw typical speed time curve for main line and derive expression for max speed using trapezoidal speed time curve.	**07**
	(b)	A train is required to run between two stations 2 km apart at an average speed of 40 km/h. The run is to make to simplified quadrilateral speed-time curve. If the maximum speed is to be limited to 64 km/h, acceleration to 2 km/h/s and coasting and braking retardations to 0.16 km/h/s and 3.2 km/h/s respectively, determine the duration of acceleration, coasting and braking.	**07**
		OR	
Q.3	**(a)**	What is co-efficient of adhesion? What are the factors affecting the co-efficient of adhesion?	**07**
	(b)	An electric train has a dead weight of 150 tonnes and it runs on a track with up gradient of 1:100. The rate of acceleration is 2 kmphps starting from rest. The train resistance is 40 NW/tonne. Consider the rotational inertia as 10%. Calculate following: (a) The value of the total tractive effort (b) Tractive effort exerted by each motor. If the train has 4 motors. Take diameter of the wheel as 92 cm and efficiency of gear drive as 90%.	**07**
Q.4	**(a)**	Classify various types of electric heating methods. Explain any one in detail.	**07**
	(b)	Explain indirect type arc furnace with neat sketch.	**07**
		OR	
Q.4	**(a)**	Discuss advantages of electric welding and give classification of electric welding.	**07**
	(b)	Discuss the process of electric arc welding.	**07**
Q.5	**(a)**	Discuss factors affecting in electro deposition.	**07**
	(b)	Explain laws of electrolysis.	**07**

OR

Q.5	**(a)**	Explain with the circuit diagram the working of a fluorescent lamp.	**07**
	(b)	State and explain laws of illumination.	**07**

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