Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III(New) • EXAMINATION – WINTER 2016

Subject Code:2133402 **Date:02/01/2017**

Subject Name:Electrical Drives and Controls

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.**

MARKS

Q.1 **Short Questions** **14**

1 The back emf in a dc motor_____.
- (a) Opposes the applied voltage.
- (b) Aids the applied voltage.
- (c) Aids the armature current.
- (d) None of the above.

2 A dc series motor will overspeed when_____.
- (a) The field it opened.
- (b) The load is increased.
- (c) The armature circuit is opened.
- (d) Load is removed.

3 DC shunt motor are used in those applications where_____ is required.
- (a) High starting torque.
- (b) Practically constant speed.
- (c) High no-load speed.
- (d) Variable speed.

4 The speed of dc motor can be controlled by changing
- (a) Its flux
- (b) Armature circuit resistance
- (c) Applied voltage
- (d) All of the above

5 Motor starters are essential for
- (a) Accelerating the motor
- (b) Starting the motor
- (c) Avoiding excessive starting current
- (d) Preventing fuse blowing

6 The rheostatic speed control method is
- (a) Economical
- (b) Efficient
- (c) Suitable for getting speeds above normal.
- (d) Unsuitable for rapidly changing loads.

7 The stator of a 3 phase induction motor produces_____ magnetic field.
- (a) Steady
- (b) Rotating
- (c) Alternating
- (d) None of the above.

8 The starting torque of 3 phase induction motor is _____ supply voltage.
- (a) Independent of
- (b) Directly proportional to

(c) Directly proportional to square of
(d) None of the above

9 For higher efficiency of 3 phase induction motor, the slip should be_____.
(a) Large
(b) Very large
(c) As small as possible
(d) 1.

10 A 50 Hz, 4 pole single phase induction motor will have a synchronous speed of _____?

11 A 4 pole, 50 Hz single phase induction motor has a slip of 5%. The speed of the motor will be_____?

12 A capacitor start, capacitor run motor has_____.
(a) Low power factor
(b) High power factor
(c) Low efficiency
(d) High efficiency

13 The starting winding of a single phase motor is placed in the_____.
(a) Rotor
(b) Stator
(c) Armature
(d) Field.

14 Define Slip.

Q.2	**(a)**	Explain basic elements of electric drives.	**03**
	(b)	Explain types of electric drives.	**04**
	(c)	Compare AC & DC Drives	**07**
		OR	
	(c)	Explain motor used in steel rolling mills, cranes & hoists.	**07**
Q.3	**(a)**	Explain construction of 3 phase induction motors	**03**
	(b)	Explain different types of DC motors.	**04**
	(c)	A 4 pole, 3 Phase, 50 Hz, star connected induction motor has a full load slip of 4%. Calculate full load speed of the motor.	**07**
		OR	
Q.3	**(a)**	Explain characteristics of DC shunt motor.	**03**
	(b)	Explain characteristics of 3 phase Induction motor.	**04**
	(c)	A DC shunt motor runs at a speed of 1000 rpm on no load taking a current of 6 ampere from the supply, when connected to 220volts DC supply. Its full load current is 50 Amp. Calculate its speed on full load. Assume Ra= 0.3 ohm and Rsh= 110 ohm	**07**
Q.4	**(a)**	Explain necessity of starter in DC motor.	**03**
	(b)	Electric braking of DC series motor.	**04**
	(c)	Explain 3 point starter with neat sketch.	**07**
		OR	
Q.4	**(a)**	Explain necessity of starter in 3 phase Induction motor.	**03**
	(b)	Electric braking of Induction motor.	**04**
	(c)	Explain Rotor resistance starter & direct online starter (DOL)	**07**
Q.5	**(a)**	Explain speed control of DC series motor.	**03**
	(b)	Explain kramer's system for slip power recovery.	**04**
	(c)	Compare chopper & controlled Rectifier.	**07**
		OR	
Q.5	**(a)**	Explain Double field revolving theory.	**03**
	(b)	Explain voltage-frequency control method for induction motor.	**04**
	(c)	Explain classification of choppers.	**07**

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