Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2133402 **Date: 31/05/2017**

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 DC motor, which can provide zero speed regulation at full load without any controller is
(a) Series
(b) Shunt
(c) Cumulative Compound
(d) Differential Compound

2 When load is removed, _____motor will run at the highest speed.
(a) Shunt
(b) Cumulative – compound
(c) Differential-compound
(d) Series

3 The speed of a dc motor can be controlled by varying
(a) Its flux per pole
(b) Resistance of armature circuit
(c) Applied voltage
(d) All of the above

4 The d.c. series motor should always be started with load because
(a) At no load, it will rotate at dangerously high speed
(b) It will fail to start.
(c) It will not develop high starting torque.
(d) All are true.

5 In a d.c. machine, the armature mmf is
(a) Stationary w.r.t. armature.
(b) Rotating w.r.t. field.
(c) Stationary w.r.t. field
(d) Rotating w.r.t. brushes.

6 A series motor is best suited for driving
(a) Lathes
(b) Cranes and hoists
(c) Shears and punches
(d) Machine tools

7 The Eb/V ratio of a dc motor is an indication of its
(a) Efficiency
(b) Speed regulation
(c) Starting torque
(d) Running Torque

8 In an induction motor the relationship between stator slots and rotor slots is that
(a) stator slots are equal to rotor slots
(b) stator slots are exact multiple of rotor slots
(c) stator slots are not exact multiple of rotor slots
(d) none of the above

9 Slip of an induction motor is negative when
(a) magnetic field and rotor rotate in opposite direction
(b) rotor speed is less than the syn-chronous speed of the field and are in the same direction
(c) rotor speed is more than the syn-chronous speed of the field and are in the same direction
(d) none of the above

10 The maximum torque in an induction motor depends on
(a) frequency
(b) rotor inductive reactance
(c) square of supply voltage
(d) all of the above

11 Rotor rheostat control method of speed control is used for
(a) squirrel-cage induction motors only
(b) slip ring induction motors only
(c) both (a) and (b)
(d) none of the above

12 Slip rings are usually made of
(a) copper
(b) carbon
(c) phosphor bronze
(d) aluminium

13 For driving high inertia loods best type of induction motor suggested is
(a) slip ring type
(b) squirrel cage type
(c) any of the above
(d) none of the above

14 A squirrel cage induction motor is not selected when
(a) initial cost is the main consideration
(b)maintenance cost is to be kept low
(c) higher starting torque is the main consideration
(d) all above considerations are involved

Q.2	**(a)**	State the different types of DC motors.	**03**
	(b)	Draw and explain block diagram of an electrical drive.	**04**
	(c)	Compare A.C and D.C drives.	**07**
		OR	
	(c)	Write a note on factors influencing the choice of electrical drives.	**07**
Q.3	**(a)**	Draw and explain Torque-Speed characteristic of DC series motor	**03**
	(b)	Draw and explain Speed-Armature current characteristic of DC series motor	**04**
	(c)	Explain Electric braking of DC shunt motor.	**07**
		OR	
Q.3	**(a)**	Draw and explain Speed-Armature current characteristic of DC shunt motor	**03**
	(b)	Draw and explain Torque-Speed characteristic of DC shunt motor	**04**
	(c)	Draw and explain torque/speed curve of 3-phase induction motor	**07**
Q.4	**(a)**	Draw and explain rotor rheostat control of slip-ring induction motor in brief.	**03**
	(b)	Write a note on construction of 3-phase induction motor.	**04**
	(c)	Explain Half bridge inverter with inductive load.	**07**
		OR	
Q.4	**(a)**	Explain Rotor resistance starter.	**03**
	(b)	Explain armature control of DC shunt motor.	**04**
	(c)	Explain DC series motor drive with controlled rectifier.	**07**
Q.5	**(a)**	What is the need of starter in DC motor?	**03**
	(b)	Explain working of three-point starter in brief.	**04**
	(c)	Explain voltage frequency speed control method for induction motor.	**07**
		OR	
Q.5	**(a)**	Explain working of Star-Delta starter in brief.	**03**
	(b)	Explain static Kramer drive in brief.	**04**
	(c)	Explain Ward-Leonard system for DC motor speed control.	**07**

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