

Enrollment No: _____

Exam Seat No: _____

C.U.SHAH UNIVERSITY

Winter Examination-2018

Subject Name : Electrical Machine-I

Subject Code : 4TE03EMC1

Branch: B.Tech (Electrical)

Semester : 3

Date : 06/12/2018

Time : 02:30 To 05:30

Marks : 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
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- Q-1 Attempt the following questions: (14)**
- a) The armature of DC generator is laminated to (1)**
1. Reduce Hysteresis loss
 2. Insulate the Core
 3. Reduce eddy current loss
 4. Provide air cooling passage
- b) In Lap winding, the number of brushes is always (1)**
1. Double the number of poles
 2. Same as number of poles
 3. Half the number of poles
 4. Multiple of number of poles
- c) The insulating material used for the commutator segment is generally (1)**
1. Graphite
 2. Carbon
 3. Mica
 4. Insulating varnish
- d) A three point starter is suitable for (1)**
1. Shunt Motor
 2. Series Motor
 3. Shunt & Compound Motor
 4. Shunt, Series, and compound motor
- e) Which DC motor is preferred for Elevator? (1)**



1. Differentially compound motor
 2. Series motor
 3. Shunt Motor
 4. Cumulative compound motor
- f) Which DC motor is preferred for constant speed? (1)
1. Series motor
 2. Compound motor
 3. Shunt motor
 4. Differential motor
- g) The function of yoke in a DC machine is (1)
1. To provide mechanical protection
 2. To reduce eddy current
 3. Flux path completion
 4. Both 1 & 3
- h) If supply frequency of a transformer increases, the secondary output voltage of the transformer (1)
1. Increase
 2. Decrease
 3. Remain same
 4. Any of the above
- i) The main purpose of performing short circuit test in a transformer is to measure its (1)
1. Copper loss
 2. Core loss
 3. Insulation Resistance
 4. Total loss
- j) In a transformer the primary flux is _____ secondary flux. (1)
1. Greater than
 2. Smaller than
 3. Either 1 & 2
 4. Equal to
- k) What would happen if a transformer is connected to a DC supply? (1)
1. No effect
 2. Operate with high efficiency
 3. Damage the transformer



4. Operate with low frequency

- l) A 3-phase 440 V, 50 Hz induction motor has 4% slip. The frequency of rotor current will be (1)
1. 50 Hz
 2. 25 Hz
 3. 5 Hz
 4. 2 Hz
- m) If any two phases for an induction motor are interchanged (1)
1. The motor will run in reverse direction
 2. The motor will continue to run in the same direction
 3. The motor will stop
 4. The motor will Burn
- n) Blocked rotor test in an induction motor is used to determine (1)
1. Leakage impedance
 2. Copper loss
 3. Both 1 & 2
 4. None of the above

Attempt any four questions from Q-2 to Q-8

- Q-2 Attempt all questions (14)**
- (a) Explain constructional details of D.C. generator. And also give the classification with neat diagrams. (7)
- (b) State and explain various losses which occur in a d. c generator. (7)
- Q-3 Attempt all questions (14)**
- (a) What is Commutation ? And also explain Methods of Improving Commutation. (7)
- (b) State the various method of speed control of DC series Motor and Explain any one method in detail. (7)
- Q-4 Attempt all questions (14)**
- (a) Derive condition for maximum torque for induction motor and explain Torque-Slip and Torque- speed characteristics (7)
- (b) Why starters are used in DC shunt motors? Explain 3-point starter with neat diagram. (7)
- Q-5 Attempt all questions (14)**
- (a) Explain the Speed control methods of d.c shunt motor. (7)
- (b) Explain Swinburne's test to find the efficiency of a d. c. motor. (7)
- Q-6 Attempt all questions (14)**
- (a) Explain open and short circuit test for single phase transformer. while making (7)



- short circuit test, low voltage winding is always short circuited. why? (7)
- (b) A 25 KVA transformer has 500 turns on the primary and 50 turns on the secondary winding. The primary is connected to 3000 V, 50 Hz supply. Find the full load primary and secondary currents, the secondary e.m.f. and the maximum flux in the core. Neglect leakage drops and no load primary current. (7)

Q-7 Attempt all questions (14)

- (a) Explain the working principal of Single Phase Transformer. Also Explain the difference between core type and shell type transformer. (7)
- (b) Draw and Explain the equivalent circuit of single phase transformer. (7)

Q-8 Attempt all questions (14)

- (a) Explain different methods of measurement of slip of three phase induction motor. (7)
- (b) Explain the principle of induction motor. Discuss the construction of three phase induction motor. (7)

