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4th Sem, **Branch** : Electrical Engg.

**Subject** :Electrical Machines-I

**Time** : 3 Hrs.

**M.M.** : 100

### SECTION-A

**Note** : Multiple choice questions. All questions are compulsory. (10x1=10)

Q.1 The Angle between stator field and rotor field is known as. (CO-1)

- a) Power factor                      b) Torque angle
- c) Both A & B                        d) None of the above

Q.2 Yoke of DC machine is made of \_\_\_\_\_ (CO-2)

- a) Silicon steel                      b) Brass
- c) Cast Iron                         d) Carbon

Q.3 Which of the following motor runs at constant speed (CO-4)

- a) DC shunt motor                  b) DC series motor
- c) Both A & B                        d) None of the above

Q.4 Core of a transformer is laminated (CO-5)

- a) To reduce hysteresis losses
- b) To reduce copper losses
- c) To reduce eddy current losses
- d) None of the above

Q.5 The brushes of DC motor is made of (CO-2)

- a) Silicon Steel                      b) Brass
- c) Mica                                 d) Carbon

Q.6 The rating of D.C. Generator is in (CO-1)

- a) KW                                      b) KVAR
- c) KVA                                    d) None of the above

Q.7 Which of the following is not a part of transformer (CO-9)

- a) Conservator                        b) Breather
- c) Buchholz relay                    d) Exciter

Q.8 Which types of transformer connection is preferred incase of distribution transformers? (CO-8)

- a) Star/Star                              b) Delta/Delta
- c) Star/Delta                            d) Delta/Star

Q.9 Electrical machine which converts mechanical energy into electrical energy is known as. (CO-1)

- a) Electrical generator                b) Electrical motor
- c) Transformer                        d) All of the above

Q.10 In a transformer which of the following does not change? (CO-5,6,9)

- a) Voltage                                b) Current
- c) Frequency                            d) All of the above

### SECTION-B

**Note** : Objective type questions. All questions are compulsory. (10x1=10)

Q.11 A 6 pole lap wound d.c. motor will have \_\_\_\_\_ parallel paths. (CO-2)

Q.12 Fleming's right-hand rule is used to determine the direction of induced emf. (True/False) (CO-1)

Q.13 Define Armature reaction? (CO-1)

Q.14 The commutator segment of DC machine are made up of \_\_\_\_\_ material. (CO-1,2)

- Q.15 State Lenz's law. (CO-2)  
 Q.16 Transformer works on the principle of \_\_\_\_\_. (CO-5)  
 Q.17 The efficiency of a D.C. Machine will be maximum when Variable losses = (CO-2)  
 Q.18 Write any one application of DC Series motor (CO-4)  
 Q.19 Open circuit test is usually performed to determine \_\_\_\_\_ losses in a Transformer. (CO-7)  
 Q.20 \_\_\_\_\_ material is used in a breather. (CO-9)

### SECTION-C

**Note :** Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

- Q.21 State the Faraday's law of electromagnetic induction. (CO-1,2,5,6)  
 Q.22 Explain the working principle of A 1 phase transformer. (CO-5,6)  
 Q.23 Write down the conditions for parallel operation of a 3-phase transformer. (CO-8,9)  
 Q.24 Draw and explain the torque vs armature current characteristics of a d.c. Series motor. (CO-2)  
 Q.25 Write a short note on an auto transformer and its uses. (CO-6)  
 Q.26 Explain the various types of losses occur in a D.C. Machine. (CO-2)  
 Q.27 .discuss, why a D.C. Series motor cannot work on no-load. (CO-2)  
 Q.28 Differentiate between a generator & motor. (CO-1,2)  
 Q.29 Discuss the Buchholtz relay. (CO-9)  
 Q.30 Derive the condition for maximum efficiency of a transformer. (CO-5).

- Q.31 Differentiate between power transformer and distribution transformer. (CO-8,9)  
 Q.32 Drive the e.m.f. equation of a d.c. Generator. (CO-1)  
 Q.33 Describe the flux control method of speed control of d.c. Shunt motor. (CO-3)  
 Q.34 Explain the function of conservator in a 3 phase transformer. (CO-9)  
 Q.35 Explain the behaviour of a 1 phase transformer on no load with phasor diagram. (CO-5)

### SECTION-D

**Note :** Long Answer type question. Attempt any two questions out of three questions. (2x10=20)

- Q.36 Explain the working of a 3 point starter for a d.c. Shunt motor with neat diagram. (CO-2)  
 Q.37 Define voltage regulation. Drive the expression to find the no-load secondary terminal voltage of a 1-phase transformer for a inductive load. (CO-7)  
 Q.38 Explain various, methods of cooling of a 3 phase transformer. (CO-9)

**Note :** Course Outcome (CO) mentioned in the questions paper is for official purpose only.