

24026

**B. Tech. 3rd Semester (EE) F. Scheme
Examination, December-2014
ELECTRICAL MACHINES-I
Paper-EE-207-F**

Time allowed : 3 hours]

[Maximum marks : 100

Note : *Attempt five questions in all. First question is compulsory. Attempt one question from each section.*

1. (a) What advantages has the star connection over the delta connection ?
- (b) What steps are usually taken to reduce the leakage reactance while providing tappings in a transformers ?
- (c) What is the difference between off load tap changing transformers and on load tap changing transformer ?
- (d) How a three phase induction regulator can be used as a phase shifting device ?
- (e) Why is the yoke of a dc m/c not laminated whereas the armature core is laminated ?
- (f) Why are commutation poles provided in the construction of a large dc machine ?
- (g) Why the armature resistance control method is the most common method of adjusting the speed of dc series motor ?
- (h) What precautions are taken during starting of dc shunt and series motors and why ?

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Section–A

2. (a) Explain the working principle and construction of an auto transformer. 10
- (b) Explain, with diagrams, the difference between two winding and three winding transformers. 10
3. How does the high leakage reactance transformer differ from a conventional two winding transformer ? Explain. Give its output characteristic? Where does it find applications ? 20

Section–B

4. (a) What are various functions of a transformer ? 10
- (b) Explain with phasor diagram how the flux in the transformer core remains fairly constant from no load to full load assuming lagging power factor. 10
5. (a) State the various losses which take place in a transformer. On what factors do they depend ? 10
- (b) What is transformer regulation ? How it can be obtained from equivalent circuit parameters ? 10

Section-C

6. Illustrate with suitable diagrams the patterns of
- (i) lap winding and
 - (ii) wave winding of the armature of a dc. machine
- Explain the relative merits and applications of two types of windings. 10
7. (a) Why the mica is frequently undercut to a level below the commutator surface ? 10
- (b) What do you understand by armature reaction ? Explain the concept of demagnetizing and cross magnetizing armature ampere-turns. 10

Section-D

8. (a) Enlist different speed control methods for dc motor. Discuss the merits and demerits of each method. 10
- (b) Derive the torque and output power equations for d.c. motors. 10
9. Explain why a starter is required for starting a d.c. motor. Describe a 3-point starter having no-volt and overload protections for starting a dc. shunt motor. Why modification is made in a 4 point starter ? 20