

Roll No.

24026

B. Tech. 3rd Sem. (Electrical Engg.)

Branch - 1

Examination – December, 2013

ELECTRICAL MACHINES - I

'F' SEHEME

Paper : EE-207-F

Time : Three hours] [Maximum Marks : 100

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

- Note :** (i) Question No. 1 is *compulsory*.
(ii) Attempt *four* questions from remaining *four* parts selecting one question from each part.

1. (a) What is armature reaction ? 20

(b) What is linear commutation ?

(c) What is the purpose of compensating winding in a dc machine ?

- (d) How may iron loss be reduced to a minimum ?
- (e) Why eddy current loss of a transformer depends on applied voltage ?
- (f) What is a booster transformer ?
- (g) What advantages has the star connected over the delta connected ?
- (h) What is the function of commutator in a dc machine ?

PART - A

2. Draw and explain the phasor diagram of a transformer on load. How it affects the power factor of the loaded transformer. 20
3. The primary and secondary winding of a 500kva 1-ph transformer have resistance of 0.4Ω and 0.0015Ω respectively. The primary and secondary voltages are 6000V and 400V respectively and the iron loss is 3.2KW. Calculate the efficiency on
- (i) Full load and
 - (ii) Half load
- Assuming the pf of the load to be 0.8. 20

PART - B

4. (a) What is an autotransformer ? State its merit and demerits over the two winding transformer. 10
- (b) Explain the constructional detail of a 3-phase transformer with dia. 10
5. Two transformer are connected in open delta and supply a balanced 3phase load of 240 KW at 400 volts and a pf of 0.866. Determine : 20
- (i) The secondary line current.
- (ii) The kva load on each transformer.
- (iii) The power delivered by the individual transformer.

PART - C

6. (a) Derive the emf equation of a DC machine. 10
- (b) Sketch the external characteristics of shunt, series & compound generator. 10
7. A 4 pole dc shunt generator with wave wound armature has 40 slots each having 12 conductors armature reaction is 1Ω and shunt field resistance is

200Ω. The flux per pole is 25m Wb. If a load of 50Ω is connected across the armature terminal. Calculate the voltage across the load when the generator is driven at 1000rpm. What will be the load voltage if the generator is lap wound. 20

PART - D

8. Describe different methods of speed control of dc shunt motor. 20
9. (a) Explain the working of a four point starter of a dc machine. 10
- (b) Explain why starter is required for starting a dc motor. 10
-