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Roll No. ....

**313**

**B. Tech. EXAMINATION, Dec. 2017**

(Third Semester)

(Old Scheme) (Re-appear Only)

(EE, EEE)

EE-207

ELECTRICAL MACHINES-I

*Time : 3 Hours*]

[*Maximum Marks : 100*

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

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**Note :** Attempt any *Five* questions. All questions carry equal marks.

**1.** Develop the exact equivalent circuit of a single phase transformer. From this derive the

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approximate and simplified equivalent circuit of the transformer. State the various assumptions made.

2. Derive an expression for the saving in autotransformer as compared to an equivalent two winding transformer.
3. Describe SCOTT Connection for Three phase to two phase conversion. How the neutral point is located, describe with phasor diagram ?
4. The maximum efficiency of a 100 kVA, 1-phase transformer is 98% and occurs at 80% of full loped at 0.8 p.f. lagging. If leakage impedance of the transformer is 5%. Find the voltage regulation at full load.
5. Draw a neat sketch of a d.c. generator. State the functions of each part. Derive the emf equation of d.c. generator.
6. An 8-pole lap-wound d.c. generator armature has 960 conductors. A flux of 40mWb and a speed of 400 rpm. Calculate the emf generated on open circuit. If the same armature is wave wound, at what speed must it be driven to generate 400V.
7. What is the necessity of a starter for a d.c. motor ? Explain with the neat sketch, the working of a 3-point d.c. shunt motor starter, bringing out the protective features incorporated in it.
8. A 50 kW, 250 v d.c. shunt generator runs at 1200 rpm. If this machine is run as d.c. motor taking 30 kW at 250 V, what will be its speed ? The armature and shunt field resistance are 0.1 ohm and 125 ohm respectively. Brush drop is 2 V.