



SCHOOL OF ELECTRICAL ENGINEERING
CONTINUOUS ASSESSMENT TEST - I
FALL SEMESTER 2025-2026

Programme Name & Branch : B.Tech (EEE)
Course Code and Course Name : BEEE215L – DC machines and Transformers
Faculty Name(s) : Dr.Gokulakrishnan G
Class Number(s) : VL2025260101049
Date of Examination : 23/08/2025
Exam Duration : 90 minutes **Maximum Marks: 50**

General instruction(s):

- Answer All Questions
 - Rough work should not be done on question paper. It will be treated as malpractice.
- Course Outcomes Statements:

CO. 1: Apply the concept of rotating machines and the principle of electromechanical energy conversion in single and multiple excited systems

CO. 2: Analyze the output of DC machines and transformers and evaluate their performance

Q. No	Question	M	CO	BL
1.	For a singly excited system, derive the expression for magnetic field energy stored and hence explain the concept of co-energy.	10	1	2
2.	A separately excited generator, when running at 1000 rpm supplies 200A at 125V. What will be the load current when the speed drops to 800 rpm, if field current remains same? Given that the armature resistance = 0.04Ω and total brush drop = 2V.	10	2	3
3.	(a) Why is a commutator and brush assembly necessary for operation of a D.C. machine?	3	2	2
	(b) An 8-pole wave wound D.C. generator has 480 conductors. The armature current is 200A. Find the armature reaction demagnetising and cross-magnetising ampere-turns per pole if (i) brushes are on G.N.A and (ii) brushes are shifted 6 electrical degrees from G.N.A.	7		
4.	(a) List out the types of D.C. generators. When is a compound generator operation said to be cumulative and differential?	3	2	2
	(b) A long shunt compound generator running at 1000 rpm supplies 22 kW at a terminal voltage of 220V. The resistances of armature, shunt field and series field are 0.05Ω , 110Ω and 0.06Ω respectively. The overall efficiency is 88%. Find (i) Copper losses (ii) Constant losses.	7		
5.	What important conditions must be fulfilled before a shunt generator is connected in parallel with another? Explain the procedure for connecting a shunt generator in parallel with others already supplying load.	10	2	3