PRESIDENCY UNIVERSITY

BENGALURU

Make-up Examinations – December 2025

Date: 27 – 12- 2025   **Time:** 01:00pm – 04:00pm

School: SOE	**Program:** B.Tech-EEE
Course Code : EEE2016	**Course Name:** Electrical Machines-I
Semester: MK	**Max Marks**: 100 — **Weightage**: 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5
Marks	19	19	25	25	--

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2 marks.   **10 Q x 2M=20M**

1.	Comment on How iron losses varies with the reversal magnetic field in a generator?	2 Marks	L1	CO1
2.	List out the all parts of dc generator?	2 Marks	L1	CO1
3.	Draw the characteristics of DC series motor and list out the industrial applications ?	2 Marks	L1	CO2
4.	Write the relevant equations to control the speed of dc shunt motor?	2 Marks	L1	CO2
5.	Mention the various losses in a transformer and write the condition for maximum efficiency.	2 Marks	L1	CO3
6.	Comment on voltage regulation for Power & Distribution Transformer.	2 Marks	L1	CO3
7.	Mention the list of cooling methods employed for transformer and write the role of Buchholz relay relay in Transformer?	2 Marks	L1	CO3
8.	What is the purpose of Scott connection and applications of Scott connection?	2 Marks	L1	CO4
9.	Define transformation ratio(K) of a transformer and compute the value of K for Teaser and Main Transformer in Scott Connection, if the Primary voltage is 1100V and Secondary is 220V.	2 Marks	L1	CO4
10.	Write down the Line to Line and Phase Voltage relationships in case of DELTA to STAR connections?	2 Marks	L1	CO4

Part B

Answer the Questions.   **Total Marks 80**

11.		Interpret the emf induced in the armature of a two pole generator whose armature has 280 conductors and is revolving at 1000 rpm. The flux per pole is 0.03 Weber.	10 Marks	L2	CO1
	a.				
	b.	Interpret the generated emf of a DC Generator which has 4 poles total number of conductors equal to 256 Lap wound running at 2000 rpm. The useful flux per pole is 0.2 Weber.	10 Marks	L2	CO1

<div align="center">or</div>

12.	**a.**	With neat sketch explain the following constructional components of DC Machine and its principle (i) Magnetic Frame or Yoke (ii) Pole Core (iii) Field Coils (iv) Armature (v) Armature Winding (vi) Commutator (vii)Brushes and Bearings.	20 Marks	L2	CO1

13.	**a.**	With neat sketch explain three point starter to start the DC Shunt Motor.	15 Marks	L2	CO2

<div align="center">or</div>

14.	**a.**	A 440 V D.C. shunt motor takes 4A at no load. Its armature and field resistances are 0.4 ohms and 220 ohms respectively. Estimate the kW output and efficiency when the motor takes 60A on full load.	15 Marks	L2	CO2

15.	**a.**	Obtain the generalized conditions for parallel operation of Transformer. Also explain the effect of load sharing due to impedance variation between transformers during parallel operation.	10 Marks	L2	CO3
	b	A 100 KVA, 3300 V/240 V, 50 HZ single phase transformer has 990 turns on the primary. Identify the number of turns on secondary and the approximate value of primary and secondary full load currents.	10 Marks	L2	CO3

<div align="center">Or</div>

16.	**a.**	A 40kVA distribution transformer has iron loss of 500 W and full load copper loss of 500 W. the transformer is supplying a lighting load. The load cycle is as under: Full load for 4 hours, half load for 8 hours and no load for 12 hours. Calculate the all day efficiency. Bearings.	20 Marks	L2	CO3

17.	**a.**	A three phase step down transformer takes 15A when connected to 4400V mains. The turns ratio per phase is 10. Neglecting losses. Calculate the secondary line voltage , line current and the output of the transformer if the windings are connected in (i) delta/delta (ii) delta/star iii) star/delta (iv) star/star.	25 Marks	L2	CO4

<div align="center">Or</div>

18.	**a.**	Two single phase electric furnaces A and B are supplied at 230V from a three phase 1100V supply by means of a Scott connected transformer combination. If the the output of main transformer is 300kW at 0.6 power factor lagging and teaser transformer is 400kW at UPF. i) Calculate the currents in the winding and transformation ratio of each transformer. ii) Comment on phase angle between teaser and main transformer secondary voltages	25 Marks	L3	CO4