REG.NO.: 24BEE0103

SLOT: D1

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SCHOOL OF ELECTRICAL ENGINEERING
CONTINUOUS ASSESSMENT TEST - II
WINTER SEMESTER 2025-2026

Programme Name & Branch	**: B.Tech. (EEE)**
Course Code and Course Name	**: BEEE312L - AC Machines**
Faculty Names	**:Dr. P.Vijayapriya, Dr.R. Mageshvaran**
Class Numbers	**: 4231, 2256**
Date of Examination	**: 18/3/2026**
Exam Duration	**: 90 minutes**

Maximum Marks: 50

General instructions:

- Answer All Questions (Provide Graph Sheets)
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
- Course Outcomes
  2. Analyse the characteristics of synchronous machines and asynchronous machines
  3. Perform various tests on synchronous machines and asynchronous machines to analyze its performance

Q. No	Question	Module	Marks	CO	BL
1.	A 220V, 50Hz single-phase induction motor has the following equivalent circuit parameters: Stator resistance R_1 = 2 Ω, Stator reactance X_1 = 3 Ω and Magnetising reactance X_m = 60 Ω. Rotor resistance referred to stator R_2' = 3 Ω and Rotor reactance referred to stator X_2' = 3 Ω. Determine the stator current and the power factor using the equivalent circuit of the given machine when it operates at a slip of 0.05.	3	10	2	3
2.	The No-Load and Blocked rotor test data of single phase induction motor having stator resistance (DC) of R_1 = 0.8 Ω is given below: No-Load test data: V_o=220V, I_0 = 1 A, P_0 =125 W. Blocked rotor test data: V_{sc}=50V, I_{sc} = 10 A, P_{sc} =150 W. Draw the equivalent circuit for the given single phase induction motor when operating at 5% slip.	3	10	3	3
3.	The stator of a 3-phase, 20-pole alternator has 120 slots, and there are 4 conductors per slot accommodated in two layers. If the speed of the alternator is 300 r.p.m. Calculate the e.m.f. induced per phase. Resultant flux per pole in the air gap is 0.05 wb. Assume that the coil span as 150^0 electrical.	4	10	2	3
4.	The data obtained on 100kVA, 1100 V, 3 phase alternator is DC resistance test: V = 6V DC, I = 10A DC. Skin and proximity effect factor = 1.6 OC test, Field current (DC): 12.5 A and Line Voltage (AC) = 420 V	4	10	3	3

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	SC test, Field current (DC): 12.5 A and Line current = Rated value. Calculate the voltage regulation of alternator at 0.8 pf lagging.				
5.	A 1.1MVA, 2.2 kV, 3 phase, star – connected Alternator gave the following test result during OC and SC tests Field Current (A): 10, 20, 30, 40, 50 OC voltage (kV): 0.88, 1.65, 2.20, 2.585, 2.86 Short Circuit Current (A): 200, 400, -, -, - The effective resistance of the 3 – phase winding is 0.22 ohms / phase. Estimate the full load voltage regulation at 0.8 pf lag by Ampere – Turn method.	4	10	3	3

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