SRI BHARATHI

ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Kaikkurichi, Pudukkottai -622 303

www.sbec.edu.in

NAAC DOCUMENTS

Quality Indicator Frame Work

Criterion – 1

CURRICULAR ASPECTS

Submitted by

IQAC

Internal Quality Assurance Cell

Sri Bharathi Engineering College for Women

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)
Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

Criterion 1	Curricular Aspects	100

1.1 Curricular Planning and Implementation (20)

1.1.1 The Institution ensures effective curriculum planning and delivery through a well-planned and documented process including Academic calendar and conduct of continuous internal Assessment

Table of contents

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai-25)
Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

PREFACE OF THE COURSE FILE

Batch : **2020-2024**

Academic Year : **2021-2022 / ODD**

Program : **ELECTRICAL AND ELECTRONICS ENGINEERING**

Year & Semester : **2nd Year / 3rd Semester**

Course Code : **EE8301** **NBA Course Code: C204**

Name of the Course : **Electrical Machines -I**

Faculty in-charge : **B. PRIYA AP / EEE**

Signature of the Faculty Incharge

HoD / EEE

HOD EEE
SRI BHARATHI ENGINEERING
COLLEGE FOR WOMEN
KAIKKURICHI,
PUDUKKOTTAI - 622 303.

Dr. S.THILAGAVATHI M.E.,Ph.D.,
PRINCIPAL
SRI BHARATHI ENGINEERING
COLLEGE FOR WOMEN
Kaikkurchi - 622 303, Pudukkottai Dt.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

REVIEW OF COURSE FILE

(to be pasted on the inner side of the file-backside) .(#-State Yes/No.)

S.N	Details Date:	R-I-*	R-II-*&	R-III-*&	R-IV-*&$	R-V-*&$@
1.	Preface of the course file	Yes				
2.	Vision, Mission, PEOs, POs, PSOs, Blooms taxonomy	Yes				
3.	Subject handlers of yesteryears	Yes				
4.	Timetable/Workload of the staff – Distribution of teaching load – Roles and Responsibilities	Yes				
5.	Syllabus signed by staff & HoD	Yes				
6.	Lecture Schedule signed by staff & HoD	Yes				
7.	Course Committee meeting circular and minutes					
8.	Identification of Curricular gap and Content Beyond the syllabus	Yes				
9.	Self-study topics	Yes				
10.	Previous AU Question papers	Yes				
11.	Unit wise Q&A and Objective type questions	Yes				
12.	Unit wise course material	Yes				
13.	Assignment question paper with sample answer sheets and mark entry		Yes			
14.	Tutorial question paper with key and mark entry		Yes			
15.	Class test/IA test Q Paper with Key, sample answer papers and mark entry		Yes			
16.	IA Test- result analysis-CAP-evidence-root cause analysis.		Yes			
17.	Retest –Q paper-Attendance-marks		Yes			
18.	AU Web portal entry sheet			Yes		
19.	Very poor performance in first two tests-action taken.-communication to parents-evidence					
20.	Absence for two tests-action taken-communication to parents-evidence.					
21.	Indiscipline of student reported, if any					
22.	Special class/coaching class/remedial class/attendance-CAP					
23.	Conduct of Seminar, Quizzes - proof					
24.	Content beyond the syllabus - proof			Yes		
25.	Student feedback on faculty			Yes		
26.	Course end survey			Yes		
27.	Internal Assessment sheet					
28.	AU question paper with students' feedback					
29.	Discrepancy of the question paper and correspondence, if any					
30.	AU result analysis-Details of arrear students.					Yes
31.	AU grade sheet					Yes
32.	CO – PO & PSO attainment sheet				Yes	
	Signature of Course handling faculty	BRuyr	BRuyr	BRuyr	BRuyr	BRuyr
	Signature of HoD	BRuyr	BRuyr	BRuyr	BRuyr	BRuyr

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

INDIVIDUAL STAFF WORKLOAD (2021-2022) ODD SEMESTER

S. NO	NAME OF THE STAFF	SUBJECTS HANDLED	YEAR & DEPT	HOURS ALLOCATED	TOTAL HOURS
1.	Mrs.B.PRIYA	**EE8301** -Electrical Machines-I	II EEE	5	10
		EE8702-Power System Operation and Control	IV EEE	5	
2.	Mrs.S.SUSILA DEVI	**EE8703**-Renewable Energy Systems	IV EEE	6	11
		EC8391- Control Systems Engineering	II ECE	5	
3.	Mr.SATHYARAJ.J	**EE6501**- Power System Analysis	III EEE	5	10
		EE8391- Electromagnetic Theory	II EEE	5	
4.	Ms.K.A.MUTNULAKSHMI	**EC8353**-Electronic Devices and Circuits	II EEE	5	10
		EE8351- Digital Logic Circuits	II EEE	5	
5.	Mr.A.ABDUL BASEETH	**EE8010**-Power System Transients	IV EEE	5	11
		EE2404 -Power System Simulation Laboratory	IV EEE	3	
		EE8311- Electrical Machines Laboratory-I	II EEE	3	
6.	Mrs.AKILANDESWARI.R	**EI8075**-Fibre Optics and Laser Instrumentation	IV EEE	5	10
		ME8792-Power Plant Engineering	II EEE	5	
7.	Ms.RAGADHARSHINI.R	**OMD551**-Basics of Biomedical Instrumentation	III EEE & ECE	5	11
		EE6511- Control and Instrumentation Laboratory	III EEE	3	
		EE8712- Renewable Energy Systems Laboratory	IV EEE	3	
8.	Ms.S.RAGA BRINTHA	**ORO551**-Renewable Energy Sources	III CIVIL	5	10
		EE2301- Power Electronics	III EEE	5	
9.	Mrs.C.NANTHINI	**EE6701**-High Voltage Engineering	IV EEE	5	10
		OMD551-Basics of Biomedical Instrumentation	III CSE	5	

HOD

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Kaikkuruchi, Pudukkottai- 622 303.
Email: sribharathienggcollege@gmail.com Website: www.sbec.edu.in
Phone Number: 9750928029

Department of EEE

COURSE PLAN

Sub.Code	EE8301	Branch/Year/Sem:	EEE/ II/ III
Sub.Name	ELECTRICAL MACHINES I	Batch	: 2020-2024
Staff Name	Mrs. B. PRIYA	Academic Year	: 2021-2022(ODD)

COURSE OBJECTIVES:

To impart knowledge on the following Topics

- Magnetic-circuit analysis and introduce magnetic materials
- Constructional details, the principle of operation, prediction of performance, the methods of testing the transformers and three phase transformer connections
- Working principles of electrical machines using the concepts of electromechanical energy conversion principles and derive expressions for generated voltage and torque developed in all Electrical Machines
- Working principles of DC machines as Generator types, determination of their no load/load characteristics, starting and methods of speed control of motors
- Various losses taking place in D.C. Motor and to study the different testing methods to arrive at their performance

TEXT BOOKS

T1. I. J. Nagrath and D. P. Kothari, "Electric Machines", McGraw Hill Education, 5th Edition, 2017.

T2. P. S. Bimbhra, "Electric Machinery", Khanna Publishers, 2nd Edition, 2021.

REFERENCES

R1. A. E. Fitzgerald and C. Kingsley, "Electric Machinery", New York, McGraw Hill Education, 6th Edition 2017.

R2. A. E. Clayton and N. N. Hancock, "Performance and design of DC machines", CBS Publishers, 2018.

R3. M. G. Say, "Performance and design of AC machines", CBS Publishers, First Edition 2008.

R4. Sahdev S. K. "Electrical Machines", Cambridge University Press, 2018

WEB SOURCES:

1. **https://archive.nptel.ac.in/courses/108/105/108105017/**
2. **https://archive.nptel.ac.in/content/storage/108/105/108105017/MP4/mod01lec13.mp4**
3. **https://archive.nptel.ac.in/content/storage/108/105/108105017/MP4/mod01lec17.mp4**
4. **https://archive.nptel.ac.in/content/storage/108/105/108105017/MP4/mod01lec21.mp4**

TEACHING METHODOLOGIES:

- BB - BLACK BOARD
- PPT - POWER POINT PRESENTATI

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S. No	Topic Name	Books for Reference	Page No	Teaching Methodology	No. of Periods required	Cumulative no. of Periods
UNIT – I MAGNETIC CIRCUITS AND MAGNETIC MATERIALS						
1	Fundamentals of Magnetic Circuits	T1	35	BB	1	1
2	Statically and Dynamically Induced EMF	T1	26	BB	1	2
3	Principle Of Electromechanical Energy Conversion Forces and Torque in Magnetic Field Systems	T1	150	BB	2	4
4	Energy Balance In Magnetic Circuits	T1	158	BB	1	5
5	Co-Energy in Singly Excited and Multi Excited Magnetic Field System	T1	163	BB	2	7
6	Mmf Of Distributed Windings	T1	216	BB	1	8
7	Introduction to Indian Standard Specifications (ISS)	T1	PPT	PPT	1	9
8	Role and Significance in Testing	T1	PPT	PPT	1	10
9	Tutorial	T1	BB	BB	2	12
10	Tutorial	T1	BB	BB	1	13
LEARNING OUTCOME At the end of unit, Students should be able to • Apply the laws to analyse the magnetic-circuits						
UNIT – II TRANSFORMER						
1	Construction and principle of operation	T1	49	VIDEO	1	14
2	Equivalent circuit	T1	62	BB	2	16
3	Open circuit and short circuit tests	T1	78	BB	1	17
4	Voltage regulation - phasor diagrams	T1	67	BB	1	18
5	Losses and efficiency, all day efficiency	T1	101	BB	1	19
6	Parallel operation of single-phase transformers	T1 R1	78, 210	BB	1	20
7	Applications of Single-phase transformer	T1	111	BB	1	21
8	Construction and working of auto transformer	T1	111	BB	1	22
9	Comparison with two winding transformers	T1	113	BB	1	23
10	Applications	T1	117	PPT	1	24

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	Of autotransformer					
11	Three phase transformers	T1	127	BB	1	25
12	Tutorial	T1	BB	BB	1	26

LEARNING OUTCOME

At the end of unit, Students should be able to

- To acquire the knowledge in constructional details of transformers.

UNIT – III ELECTROMECHANICAL ENERGY CONVERSION

1	Energy in magnetic system	T1	135	BB	1	27
2	Field energy and co energy-force	T1	138	BB	2	29
3	Principle Of Electromechanical Energy Conversion Forces and Torque in Magnetic Field Systems	T1	150	BB	2	31
4	Energy Balance In Magnetic Circuits	T1	158	BB	2	33
5	Co-Energy in Singly Excited and Multi Excited Magnetic Field System	T1	163	BB	2	35
6	Mmf Of Distributed Windings	T1	216	BB	1	36
7	Winding Inductances	T1	225	BB	1	37
8	Magnetic saturation and leakages	T1	228	BB	1	38
9	Tutorial	BB	230	BB	1	39

LEARNING OUTCOME

At the end of unit, Students should be able to

- To comprehend the concepts of electromechanical energy conversion

UNIT – IV DC GENERATORS

1	Principle of operation	T1	284	VIDEO	1	40
2	Armature windings and its types	T1	289	BB	1	41
3	EMF equation	T1	301	BB	1	42
4	Demagnetizing and cross magnetizing Ampere turns	R1	311	BB	2	44
5	Armature reaction	R1	310	BB	1	45
6	OCC and load Characteristics of different types of DC Generators	T1	326	BB	2	47
7	Methods of improving commutation	R1	318	BB	1	48
8	Tutorial	T1, R1	-	BB	3	51

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9	**Iot in Speed Control of DC Machines - CBS**	WEB	-	PPT	1	52

LEARNING OUTCOME

At the end of unit, Students should be able to

- To acquire the knowledge in working principles of DC Generator

UNIT – V DC MOTORS

1	Principle of operation	T1	285	VIDEO	1	53
2	Significance of back emf, torque equations and power developed by armature	T1 R1	302 201	BB	2	55
3	Speed control of DC motors	R1 T1	145 382	BB	2	57
4	Starting methods of DC motors	T1	390	BB	2	59
5	Testing of DC Machines	T1	408	BB	2	61
6	Swinburne's test, Hopkinson's test	R1 T1	111 500	BB	2	63
7	Separation of core losses-applications Of DC motors	T1	512	BB	1	64
8	Tutorial	T1	515	BB	1	65
9	**Iot in Speed Control of DC Machines - CBS**	WEB	-	PPT	2	67

LEARNING OUTCOME

At the end of unit, Students should be able to

- To acquire the knowledge in working principles of DC Motor

COURSE OUTCOME

At the end of the course students will be able to:

C204.1 Ability to analyse the magnetic-circuits

C204.2 Ability to acquire the knowledge in constructional details of transformers.

C204.3 Ability to comprehend the concepts of electromechanical energy conversion

C204.4 Ability to gain the knowledge in working principles of DC Generator

C204.5 Ability to infer the knowledge in working principles of DC Motor

C204.6 Ability to summarize the knowledge in various losses taking place in D.C. Machines

Dr. S.THILAGAVATHI M.E.,Ph.D.,
PRINCIPAL
SRI BHARATHI ENGINEERING
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CONTENT BEYOND THE SYLLABUS: **IOT IN SPEED CONTROL OF DC MACHINES**

CONTINUOUS INTERNAL ASSESSMENT DETAILS

ASSESSMENT NUMBER	I	II	III
Unit Covered	1st. & 2nd Unit	3rd	4th & 5th Unit

ASSIGNMENT DETAILS

ASSIGNMENT	I	II	III
DATE OF SUBMISSION	24.09.2021	22.10.2021	19.11.2021

ASSIGNMENT NUMBER	UNIT	DESCRIPTIVE QUESTIONS/TOPIC
1	I, II	1. Justify the importance of choosing material for magnetization or electromagnet. 2. Distinguish the types of magnetic materials 3. Summarize in detail the propels of three phase transformer connections 4. Enumerate the applications of three phase transformer 5. Dissect transformer and autotransformer with taking in to consideration of usage of copper
2	III	1. With neat sketch explain the energy balance in electrical

Dr. S.THILAGAVATHI M.E.,Ph.D.,
PRINCIPAL
SRI BHARATHI ENGINEERING
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		machines 2. With neat sketch explain the energy sored in electric circuits 3. In all electrical machines magnetic circuit act as a coupling medium why? 4. Differentiate between the energy transfer, energy stored and losses in case of motor and generator respectively.
3	**IV, V**	1. Sketch the various characteristics of generator 2. Sketch the various characteristics of generator and its impact on its applications 3. Justify the armature reaction on machines have neutral effect 4. Why DC shunt is so called constant speed motor and DC series motor is so called high torque motor? 5. What is the advantage of 4-point starter over 3-point starter?

PREPARED BY
Mrs. B. PRIYA
AP/EEE

VERIFIED BY
Mrs. B. PRIYA
HOD/EEE

HOD EEE
SRI BHARATHI ENGINEERING
COLLEGE FOR WOMEN
KAIKKURICHI,
PUDUKKOTTAI - 622 303.

APPROVED BY
PRINCIPAL

Dr. S.THILAGAVATHI M.E.,Ph.D.,
PRINCIPAL
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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

EE8301 **ELECTRICAL MACHINES – I** **L T P C**

2 2 0 3

OBJECTIVES:

To impart knowledge on the following Topics

- Magnetic-circuit analysis and introduce magnetic materials
- Constructional details, the principle of operation, prediction of performance, the methods of testing the transformers and three phase transformer connections.
- Working principles of electrical machines using the concepts of electromechanical energy conversion principles and derive expressions for generated voltage and torque developed in all Electrical Machines.
- Working principles of DC machines as Generator types, determination of their no load/load characteristics, starting and methods of speed control of motors.
- Various losses taking place in D.C. Motor and to study the different testing methods to arrive at their performance.

UNIT I MAGNETIC CIRCUITS AND MAGNETIC MATERIALS **6+6**

Magnetic circuits –Laws governing magnetic circuits - Flux linkage, Inductance and energy –Statically and Dynamically induced EMF - Torque – Properties of magnetic materials, Hysteresis and Eddy Current losses - AC excitation, introduction to permanent magnets Transformer as a magnetically coupled circuit.

UNIT II TRANSFORMERS **6+6**

Construction – principle of operation – equivalent circuit parameters – phasor diagrams, losses – testing – efficiency and voltage regulation-all day efficiency-Sumpner's test, per unit representation – inrush current - three phase transformers-connections – Scott Connection – Phasing of transformer– parallel operation of three phase transformers-auto transformer – tap changing transformers- tertiary winding.

UNIT III ELECTROMECHANICAL ENERGY CONVERSION AND CONCEPTS IN ROTATING MACHINES **6+6**

Energy in magnetic system – Field energy and co energy-force and torque equations – singly and multiply excited magnetic field systems-mmf of distributed windings – Winding Inductances-, magnetic fields in rotating machines – rotating mmf waves – magnetic saturation and leakage fluxes.

UNIT IV DC GENERATORS **6+6**

Construction and components of DC Machine – Principle of operation - Lap and wave windings-EMF equations– circuit model – armature reaction –methods of excitation commutation - interpoles compensating winding –characteristics of DC generators.

UNIT V DC MOTORS **6+6**

Principle and operations - types of DC Motors – Speed Torque Characteristics of DC Motors starting and speed control of DC motors. Plugging, dynamic and regenerative braking testing and efficiency

Dr. S. THILAGAVATHI M.E., Ph.D.,
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– Retardation test- Swinburne's test and Hopkinson's test - Permanent Magnet DC (PMDC)motors-applications of DC Motor

TOTAL: 60 PERIODS

OUTCOMES:

- Ability to analyze the magnetic-circuits.
- Ability to acquire the knowledge in constructional details of transformers.
- Ability to understand the concepts of electromechanical energy conversion.
- Ability to acquire the knowledge in working principles of DC Generator.
- Ability to acquire the knowledge in working principles of DC Motor
- Ability to acquire the knowledge in various losses taking place in D.C. Machines

TEXT BOOKS:

1. Stephen J. Chapman, 'Electric Machinery Fundamentals'4th edition, McGraw Hill Education Pvt. Ltd, 2010.
2. P.C. Sen'Principles of Electric Machines and Power Electronics' John Wiley & Sons; 3rd Edition 2013.
3. Nagrath, I.J. and Kothari.D.P., Electric Machines', McGraw-Hill Education, 2004

REFERENCES:

1. Theodore Wildi, "Electrical Machines, Drives, and Power Systems", Pearson Education., (5th Edition), 2002.
2. B.R. Gupta ,'Fundamental of Electric Machines' New age InternationalPublishers,3rdEdition ,Reprint 2015
3. S.K. Bhattacharya, 'Electrical Machines' McGraw - Hill Education, New Delhi, 3rd Edition,2009.
4. Vincent Del Toro, 'Basic Electric Machines' Pearson India Education, 2016.
5. Surinder Pal Bali, 'Electrical Technology Machines & Measurements, Vol.II, Pearson, 2013.
6. Fitzgerald. A.E., Charles Kingsely Jr, Stephen D.Umans, 'Electric Machinery', Sixth edition, McGraw Hill Books Company, 2003

Signature of the Faculty Incharge

HOD/EEE

Dr. S.THILAGAVATHI M.E., Ph.D.,
PRINCIPAL
SRI BHARATHI ENGINEERING
COLLEGE FOR WOMEN
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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Identification of Curricular Gap & Content Beyond Syllabus (CBS)

Name of the Faculty : Mrs. B. PRIYA

Course Code & Name: EE8301 & ELECTRICAL MACHINES I

Degree & Program: B.E. /EEE **Semester: III** **Academic Year: 2021 -2022 /ODD**

I. Mapping of Course Outcomes with POs & PSOs. (before CBS)

Table.1 Mapping of COs, C, PSOs with POs - before CBS.

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PS03
C204.1	3	3	2	1	-	-	-	-	-	1	-	1	3	2	-
C204.2	3	3	2	1	-	-	-	-	-	1	-	1	3	1	-
C204.3	3	3	2	1	-	-	-	-	-	1	-	1	3	1	-
C204.4	3	3	2	1	-	-	-	-	-	1	-	1	3	3	-
C204.5	3	3	2	1	-	-	-	-	-	1	-	1	3	3	-
C204.6	3	3	2	1	-	-	-	-	-	1	-	1	3	3	-
C204	3	3	2	1	-	-	-	-	-	1	-	1	3	2	-

II. Identification of content beyond syllabus.

Table.2 Identification of content beyond syllabus

Details of Content Beyond Syllabus (CBS) added	POs strengthened/ vacant filled	CO/Unit
IoT in Speed Control of DC Machines	PO7(3) and PO9(3) Vacant filled	C204.2& C204.3 & C204.4 filled

III. Mapping of Course Outcomes with POs & PSOs. (After CBS)

Table.3 Mapping of COs, C, PSOs with POs- after CBS.

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PS03
C204.1	3	3	2	1	-	-	-	-	-	1	-	1	3	2	-
C204.2	3	3	2	1	-	-	1*	-	1*	1	-	1	3	1	-
C204.3	3	3	2	1	-	-	1*	-	1*	1	-	1	3	1	-
C204.4	3	3	2	1	-	-	1*	-	1*	1	-	1	3	3	-
C204.5	3	3	2	1	-	-	-	-	-	1	-	1	3	3	-
C204.6	3	3	2	1	-	-	-	-	-	1	-	1	3	3	-
C204	3	3	2	1	-	-	-	-	-	1	-	1	3	2	-

Signature of the Faculty Incharge **HoD/EEE**

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DEPARTMENT OF ELECTRICAL AND ELECRONICS ENGINEERING

Assignment Question Paper

Assignment – 02			Date of Issue:	12.10.21	Marks	10
Course code	EE8301	Course Title	ELECTRICAL MACHINES I			
Year	II	Semester/Section	III	Date of Submission:	22.10.21	

Q. No	Questions	CO
1.	With neat sketch explain the energy balance in electrical machines	C204.3
2.	With neat sketch explain the energy sored in electric circuits	C204.3
3.	In all electrical machines magnetic circuit act as a coupling medium why?	C204.3
4.	Differentiate between the energy transfer, energy stored and losses in case of motor and generator respectively.	C204.3

B.Priya (B.PRIYA)

Name and Signature of the Faculty Incharge

HoD/EEE

HOD EEE
SRI BHARATHI ENGINEERING
COLLEGE FOR WOMEN
KAIKKURICHI
PUDUKKOTTAI - 6

Dr. S. THILAGAVATHI M.E., Ph.D.,
PRINCIPAL
SRI BHARATHI ENGINEERING
COLLEGE FOR WOMEN
Kaikkurichi - 622 303, Pudukkottai Dt.

ASSIGNMENT-2

Regno: 912620105002

Name : S. Ramadevi

EE8301 - Electrical Machine-I year : II yr - III seme

08/10

22/10/21

1. With neat sketch explain the energy balance in electrical Machines.

Generator :-

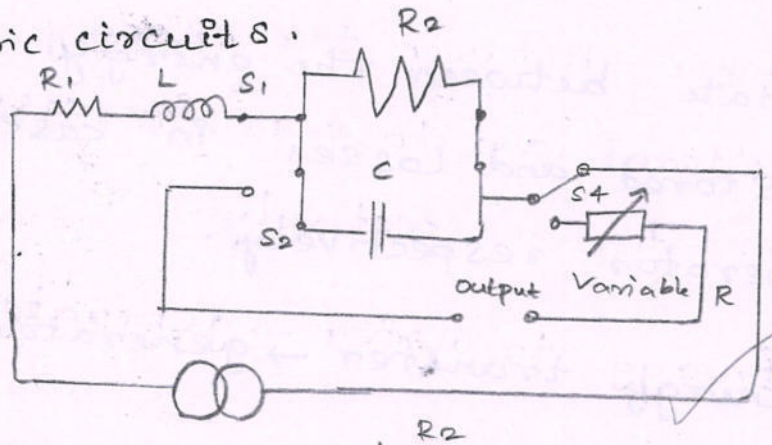
$$\begin{bmatrix}\text{Total Mechanical energy output}\end{bmatrix} = \begin{bmatrix}\text{Electrical energy output}\end{bmatrix} + \begin{bmatrix}\text{Total energy stored}\end{bmatrix} + \begin{bmatrix}\text{Total energy Dissiplated}\end{bmatrix}$$

Motor :-

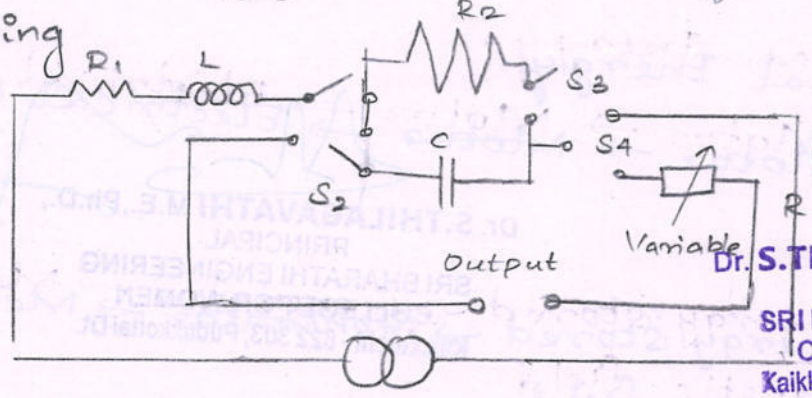
$$\begin{bmatrix}\text{Total electrical energy output}\end{bmatrix} = \begin{bmatrix}\text{Mechanical energy output}\end{bmatrix} + \begin{bmatrix}\text{Total energy stored}\end{bmatrix} + \begin{bmatrix}\text{Total energy dissiplated}\end{bmatrix}$$

2. With neat sketch explain the energy sored in electric circuits.

a) charging



b) holding



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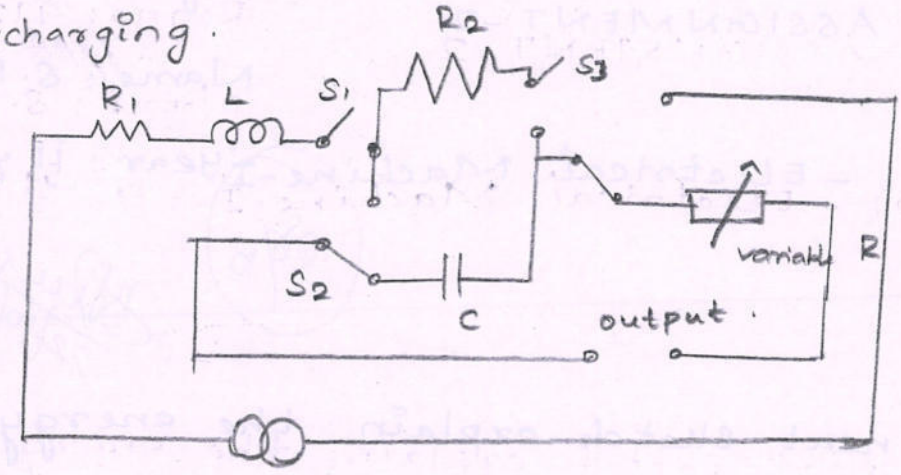
(c) discharging.



3. In all electrical Machines Magnetic circuit act as a coupling Medium why?

Generally, the magnetic field is used as the coupling Medium between electrical and Mechanical Medium because the energy is storing capacity of the Magnetic field is Much higher than the electric field.

4. Differentiate between the energy transfer, energy stored and losses in case of motor and generator respectively.

Energy transfer → generator → Mechanical to Electrical Energy.

Motor → ~~Motor~~ → Electrical to Mechanical energy.

Energy stored → Generator → Mechanical energy

Motor → Energy stored in Magnetic field as electrical energy.

Losses → Generator and Motor → Heat loss, friction and windage loss, constant.

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DEPARTMENT OF ELECTRICAL AND ELECRONICS ENGINEERING

Assignment Answer Sheet

Name of the Student: S. Ramadevi

AU Register Number: 912620105002

Assignment – 02			Date of Issue: 12/10/21		Marks	10
Course code	EE8301	Course Title	ELECTRICAL MACHINES I			
Year	II	Semester/Section	III	Date of Submission:	22/10/21	

Q. No	Questions	CO
1.	With neat sketch explain the energy balance in electrical machines	C204.3
2.	With neat sketch explain the energy sored in electric circuits	C204.3
3.	In all electrical machines magnetic circuit act as a coupling medium why?	C204.3
4.	Differentiate between the energy transfer, energy stored and losses in case of motor and generator respectively.	C204.3

Mark Allocation

Rubrics	Marks Allocated	Marks obtained
Content Quality	6	05
Presentation Quality	2	01
Timely submission	2	02
Total marks	10	08

(B. PRIYA)

Name and Signature of the Faculty Incharge

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Tutorial Question Paper

Tutorial – 01				Date of Issue:	7.9.2021	Marks	10
Course code	EE8301	Course Title	ELECTRICAL MACHINES I				
Year	II	Semester/Section	III	Date of Submission:	13.9.2021		

Q. No	Questions	CO
1	A circular iron ring has a mean circumference of 2 m and a cross sectional area of $0.02m^2$. A saw cut of 5mm wide is made in the ring. Calculate the magnetizing current required to produce a flux of 0.9milli Weber in the air gap if the ring is wound with a coil of 200 turns. Assume relative permeability of iron as 500 and the leakage facto 1.5.	C204.1
2	The core of an electromagnet is made of iron rod of 1cm diameter bent in to circle of mean diameter 10 cm, a radial air gap of 1mm being left between the ends of the rod. Calculate the direct current needed in the coil of 2000 turns uniformly spaced around the core to produce a magnetic flux of 02milliweber in the air gap. Assume that the relative permeability of the iron is 150, that the magnetic leakage factor is 1.2 and that the air gap is parallel.	C204.1
3	A 2000V/200V transformer has primary resistance and reactance of 2 ohm and 4 ohms respectively. The corresponding secondary values are 0.025 ohm and 0.04 ohm. Determine (i) Equivalent resistance and reactance of primary referred to secondary, (ii) Total resistance and reactance of primary referred to secondary, (iii) Equivalent resistance and reactance of secondary referred to primary, (iv) Total resistance and reactance of secondary referred to primary	C204.2

(Mrs. B. PRIYA)

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Tutorial Answer

13/9/2021

EE8301- Electrical Machines-I

S. Kopperundevi
9126201053O3
II/III -EEE

9/10

Q.01 Solution

Magnetic flux density of air gap $y = B_g = \Phi_g / a$

$$B_g = \frac{0.9 \times 10^{-3}}{0.02} = 0.045 \text{ wb/m}^2$$

$$H_g = \frac{0.045}{(4\pi \times 10^{-7} \times 1)} = H_g = 35828.02 \text{ AT/m}$$

$$(mmf)_g = \text{mmf of airgap} = H_g l_g$$

$$= 35828.02 \times 5 \times 10^{-3}$$

$$(mmf)_g = 179.14 \text{ AT}$$

Illy, B_i = magnetic flux density of iron path $= \Phi_i / a =$

λ = leakage flux $= \Phi_i / \Phi_g = 1.5$

$$\Phi_i = \Phi_g \times 1.5 = 0.9 \times 10^{-3} \times 1.5$$

$$\Phi_i = 1.35 \times 10^{-3} \text{ wb}$$

$$B_i = \frac{1.35 \times 10^{-3}}{0.02} = 67.5 \times 10^{-3} \text{ wb/m}^2$$

$$H_i = \frac{B_i}{(\mu_o \mu_r)} = \frac{0.0675}{(4\pi \times 10^{-7} \times 500)} \quad (\because \mu_{r(i)} = 500)$$

$$H_i = 107.48 \text{ AT/m}$$

$$(mmf)_i = H_i * l_i = 107.48 \times 2 = 214.96 \text{ AT}$$

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Total mmf = $(mmf)_g + (mmf)_i$

$= 179.4 + 214.96$

$= 394.1AT$

Magnetising current $I = \frac{\text{Total mmf}}{N}$

$I = \frac{394.1}{200} = 1.970A$

Q.02. Solution:-

$B_g = \Phi_g / a = \frac{0.2 \times 10^{-3}}{(\pi/4) \times (1 \times 10^{-2})^2}$

$= 2.546 \text{ wb/m}^2$

$H_g = B_g / (\mu_0 \mu_r) = \frac{2.546}{(4\pi \times 10^{-7} \times 1)}$

$H_g = 2026042.42 \text{ AT/m}$

$(mmf)_g = H_g * l_g = 2026042.42 \times 1 \times 10^{-3}$

$= 2026.04AT$

$(mmf)_g = 2026.04AT$; $B_i = \Phi_i / a$

$\lambda = \Phi_i / \Phi_g$

$1.2 * \Phi_g = \Phi_i$

$\Phi_i = 2.4 \times 10^{-4} \text{ wb}$

$B_i = \frac{(2.4 \times 10^{-4})}{(\pi/4 \times (1 \times 10^{-2})^2)} = 3.055 \text{ wb/m}^2$

$H_i = B_i / (\mu_0 \mu_r) = \frac{[3.055]}{[4\pi \times 10^{-7} \times 150]} = 16207.27 \text{ AT/m}$

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$$(mmf)_i = H_i * l_i$$

$$= 16207.97 \times 0.31415 \quad [\because l_i = \pi D = \pi \times 10 \times 10^{-2}]$$

$$= 5091.5 \text{ AT}$$

$$\text{Total mmf} = (mmf)_g + (mmf)_i$$

$$= 7117.55 \text{ AT}$$

$$I = \frac{7117.55}{(2000)} = 3.55 \text{ Ampere.}$$

Q.03. Solution :-

(i) $R_1' = R_1 \cdot K^2$

$$= 2 * \left(\frac{200}{2000}\right)^2 = 2 * (0.1)^2 = 0.02 \text{ ohm.}$$

$$X_1' = X_1 \cdot K^2 = 4 * (0.1)^2 = 0.04 \Omega$$

(ii) $R_{02} = R_1' + R_2$

$$= 0.02 + 0.025$$

$$= 0.045 \Omega$$

$$X_{02} = X_1' + X_2$$

$$= 0.04 + 0.04$$

$$= 0.08 \Omega$$

(iii) $R_2' = R_2/K^2 = \frac{(0.025)}{(0.1)^2} = 2.5 \Omega$

$$X_2' = \frac{X_2}{K^2} = \frac{(0.04)}{(0.1)^2} = 4 \Omega$$

(iv) $R_{01} = R_1 + R_2'$

$= 2 + 2.5$

$R_{01} = 4.5\Omega$

$X_{01} = X_1 + X_2' = 4 + 4 = 8\Omega$.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Tutorial Answer Sheet

Name of the Student: S. Kopperundevi
AU Register Number: 912620105303

Tutorial – 01			Date of Issue:	7.9.2021	Marks	10
Course code	EE8301	Course Title	ELECTRICAL MACHINES I			
Year	II	Semester/Section	III	Date of Submission:	13.9.2021	

Q.No	Questions	CO
1	A circular iron ring has a mean circumference of 2 m and a cross sectional area of $0.02m^2$. A saw cut of 5mm wide is made in the ring. Calculate the magnetizing current required to produce a flux of 0.9milli Weber in the air gap if the ring is wound with a coil of 200 turns. Assume relative permeability of iron as 500 and the leakage facto 1.5.	C204.1
2	The core of an electromagnet is made of iron rod of 1cm diameter bent in to circle of mean diameter 10 cm, a radial air gap of 1mm being left between the ends of the rod. Calculate the direct current needed in the coil of 2000 turns uniformly spaced around the core to produce a magnetic flux of 02milliweber in the air gap. Assume that the relative permeability of the iron is 150, that the magnetic leakage factor is 1.2 and that the air gap is parallel.	C204.1
3	A 2000V/200V transformer has primary resistance and reactance of 2 ohm and 4 ohms respectively. The corresponding secondary values are 0.025 ohm and 0.04 ohm. Determine (i) Equivalent resistance and reactance of primary referred to secondary, (ii) Total resistance and reactance of primary referred to secondary, (iii) Equivalent resistance and reactance of secondary referred to primary, (iv) Total resistance and reactance of secondary referred to primary	C204.2

Mark Allocation

Rubrics	Marks Allocated	Marks obtained
Problem solving approach	6	05
Correctness of Answer	2	02
Timely submission	2	02
Total marks	10	09

Mrs. B. PRIYA

Name and Signature of the Faculty Incharge

HoD/EEE

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PRINCIPAL
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IQAC Academic Audit Form

ACADEMIC YEAR: 2021-2022 ODD SEMESTER

Name of Department :	EEE	Year / Sem :	II / III	No. of Students Registered :	08
Details of Examination :	CT-1 / CT-2 / CT-3 / Model Test				

S.No.	Course Code	List of Reg.No Verified	Course Log Book Verified (Y / N)	Course File Verified (Y / N)	No of students passed	No of Absentees	No of Failures	Pass %	Remarks
1.	EE8301	912620105003	Y	Y	05	01	02	71.4	–
2.	EE8351	912620105001	Y	Y	06	01	01	85.7	–
3.	EE8391	912620105002	Y	Y	05	01	02	71.4	–
4.	EC8353	912620105302	Y	Y	06	01	01	85.7	–
5.	ME8792	912620105305	Y	Y	07	01	–	100	–
6.	MA8353	912620105303	Y	Y	04	01	03	57.14	–

Verified by

External Member Name and Signature:	P. Dennis Flora, AP/CIVIL
Internal Member Name and Signature:	Mr. J. SATHYARAJ, AP/EEE –

Overall Remarks:

Improve Pass Percentage in MA8353 Subject.

HoD/ EEE **IQAC Coordinator** **Principal** 12/2021

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENINEERING

STUDENT FEEDBACK ON FACULTY

S.NO.	DESCRIPTION	SCORED OUT OF 4	SCORED OUT OF 100
1.	The Syllabus coverage as prescribed by University.	3.25	81.25
2.	Technical knowledge of the teacher.	3.5	87.5
3.	Teacher's communication skill.	3.5	87.5
4.	Regularity in taking classes.	3.6	90.6
5.	Helping the Students in conducting the experiment through set of instructions and Demonstrations.	3.38	84.3
6.	Tendency of inviting opinion and questions on subject matter from students.	3.5	87.5
7.	Knowledge of the Teacher in latest development of field.	3.5	87.5
8.	Perfectness of Valuation.	3.5	87.5
OVERALL SCORE		3.468	86.71

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REPORT SHEET

S .NO	REG.NO	NAME	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
1.	912620105001	KAYALVIZHI K	3	4	3	4	3	4	4	4
2.	912620105002	RAMADEVI S	3	3	3	3	3	4	3	3
3.	912620105003	SRINANTHANA S	3	3	3	4	3	3	4	3
4.	912620105301	KALPANA T	3	4	3	3	4	3	3	4
5.	912620105302	KAVIYA R	3	3	4	4	4	3	3	3
6.	912620105303	KOPPERUNDEVI S	4	4	4	4	4	4	4	4
7.	912620105304	NARMATHA DEVI K	4	4	4	3	3	3	4	4
8.	912620105305	SRIBHARATHI S	3	3	4	4	3	4	3	3
		AVERAGE	3.25	3.5	3.5	3.625	3.375	3.5	3.5	3.5
		PERCENTAGE	81.25	87.5	87.5	90.625	84.375	87.5	87.5	87.5

EXCELLENT	VERY GOOD	GOOD	AVERAGE	POOR
4	3	2	1	0

Signature of the Faculty Incharge

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Circular Date: 16.09.2021

The first cycle test will be conducted on 25.09.2021, 27.09.2021, 28.09.2021 & 29.09.2021 for the III, V & VII semester (II, III & IV year) students.

The following instructions are to be followed by the faculty members.

- Total marks for which the question paper to be set will be for 60 marks. **(PART A** 10X2=20 **PART B** 2X13=26 **& PART C** 1X14=14)
- It is the responsibility of the question paper setter to take the Xerox copies of the required number of question papers and it should be handed over to the Exam cell Coordinator Mr. J. Sathyaraj AP/ EEE / Mrs. G. Bhuvaneswari AP/CSE on or before 23.09.2021.
- The Exam Coordinators (exam cell) are requested to make necessary arrangements (hall arrangements, invigilation duty etc.,) for conducting the test.
- Faculty members are requested to handover the valued answer scripts to the students on or before 01.10.2021 and the class in-charges are requested to send the consolidated mark sheet along with the attendance percentage (from 18th August 2021 to 30th September 2021) to the parents on or before 02.10.2021.

PRINCIPAL

16/9/21

Cc:

- All faculty
- Exam cell
- Office file

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Circular

Date: 16.09.2021

The first cycle test will be conducted on 25.09.2021, 27.09.2021, 28.09.2021 & 29.09.2021 for the III semester (II year) B.E students for 60 marks as per the time table given below. Students are directed to prepare well and score good marks.

Date	10.00 am -12.00 noon	1.45 pm -3.45 pm
25.09.2021	CE8351-Surveying(CIVIL) EC8395-Communication Engineering(CSE) EC8351-Electronic Circuits I (ECE) EE8301-Electrical Machines-I(EEE)	CE8392-Engineering Geology (CIVIL) CS8392-Object Oriented Programming(CSE) EC8392-Digital Electronics (ECE) EE8391-Electromagnetic Theory(EEE)
27.09.2021	MA8353-Transforms and Partial Differential Equations (CIVIL/EEE) EC8393-Fundamentals of Data Structures in C (ECE)	CE8391-Construction Materials (CIVIL) CS8391-Data Structures-(CSE) EC8391-Control System Engineering (ECE) ME8792-Power Plant Engineering (EEE)
28.09.2021	--	CE8301-Steength of Materials-I (CIVIL) CS8351-Digital Principles and System Design (CSE) EC8352- Signals and Systems (ECE) EC8353-Electron Devices and Circuits(EEE)
29.09.2021	--	CE8302-Fluids Mechanics(CIVIL) MA8351-Discrete Mathematics (CSE) EC8691- Linear Algebra and Partial Differential Equations (ECE) EE8351-Digital Logic Circuits(EEE)

PRINCIPAL

16/9/21

Cc:

- All II year B.E Classes
- All faculty
- Exam cell
- Notice Board
- Office file

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Register Number: | | | | | | | | | | | | |

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CYCLE TEST - I			Date/Session	25.09.21/FN	Marks	60
Course code	EE8301	Course Title	ELECTRICAL MACHINES I			
Regulation	2017	Duration	90 minutes	Academic Year	2021 - 2022	
Year	II	Semester	III	Department	EEE	

COURSE OUTCOMES

C204.1	Ability to analyses the magnetic-circuits
C204.2	Ability to acquire the knowledge in constructional details of transformers.
C204.3	Ability to comprehend the concepts of electromechanical energy conversion
C204.4	Ability to gain the knowledge in working principles of DC Generator
C204.5	Ability to infer the knowledge in working principles of DC Motor
C204.6	Ability to summarize the knowledge in various losses taking place in D.C. Machines

Q.No.	Question	CO	BTS
	PART A (Answer all the Questions 10 x 2 = 20 Marks)		
1	What it meant by statically induced emf	C204.1	K1
2	In what type of machine rotating magnetic field is possible	C204.1	K1
3	Define self-inductance	C204.1	K1
4	Formulate the concept of mutual inductance	C204.1	K6
5	Relate self, mutual inductance and coefficient of coupling?	C204.1	K2
6	List the application of equivalent circuit of transformer?	C204.2	K2
7	Summarize the properties of oil used in transformer?	C204.2	K2
8	Match the regulation up and regulation down for a voltage transformer.	C204.2	K1
9	How are sledging in transformer oil caused?	C204.2	K1
10	Defend the reason behind auto transformer not used as distribution transformer	C204.2	K5
	PART B (Answer all the Questions 2 x 13 = 26 Marks)		
11a	Interpret the expression for self-inductance and mutual inductance and also define coefficient of coupling	C204.1	K6
	OR		
11b	Two coils having 100 and 150 turns respectively are wound side by side on a closed iron circuit of section 125 cm^2, mean length 200cm. If permeability of iron is 2000. Estimate, (i). Self-inductance, (ii). Mutual inductance, (iii). Emf induced in 2^{nd} coil if current in 1^{st} coil changes from 0 to 5 Ampere.	C204.1	K6
12a	With the circuit diagram explain the sumpner test and how to obtain the efficiency of a transformer	C204.2	K2
	OR		
12b	Explain in detail the operation of transformer. Derive its EMF equation	C204.2	K2
	PART C (Answer all the Questions 1 x 14 = 14 Marks)		
13	The total core loss of a specimen of silicon steel is found to be 1500 watts at 50Hz, Keeping the flux density constant, the loss becomes 3000 watts when the frequency is raised to 75 Hz. Find the hysteresis loss and eddy current losses at each of those frequencies	C204.1	K1

23/9/21

Course Faculty

(B. PRIYA)

(Name /Sign / Date)

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23/9/21

HoD

(B. PRIYA)

(Name /Sign / Date

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Answer key - Cycle Test - I

25/9/21
(FN)

EE8301 Electrical Machines - I

(Regulation - 2017)

[AY - 2021 - 2022 - ODD]

PART - A

01. Statically induced Emf - Eg. Transformer - Stationary Conductors [primary & secondary winding] - changing Magnetic field (Alternating Current - Alternating flux).

02. 3ϕ - Ac Machines → Induction Machine
Syncheonous Machine.

03. $L = \frac{N\phi}{I}$; No of turns; ϕ - Magnetic flux; I - current through coil

$= N^2/S$ S → Reluctance.

04. $M = \frac{N_1 N_2}{S}$; $M = \frac{N_2 \phi_{12}}{I_1}$ (or) $\frac{N_1 \phi_{21}}{I_2}$

05. $K = \frac{M}{\sqrt{L_1 L_2}}$

06. Equivalent circuit paeametees.
To find [determine efficeency; voltage regulator

07. High Dielecteic stregth
High viscosity
Negative tempeature Co-effecient

08. Regulation up = $\frac{V_{NO} - V_{FL}}{V_{NO}} * 100$; Regulation down in % = $\frac{V_{NO} - V_{FL}}{V_{FL}} * 100$

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09. When oil sets heated due to flow of 'AC' & exposed to O2 (oxygen), sledging takes place

10. AS sation distribution is high (11000 to 400V)

PART-B

11.a $L = \frac{N\phi}{I}$; $L = \frac{N^2}{S}$; $M = \frac{N_1 N_2}{I}$; $M = \frac{N_1 \phi_{21}}{I_2}$; $\frac{N_2 \phi_{12}}{I_1}$

$$k = \frac{M}{\sqrt{L_1 L_2}}$$

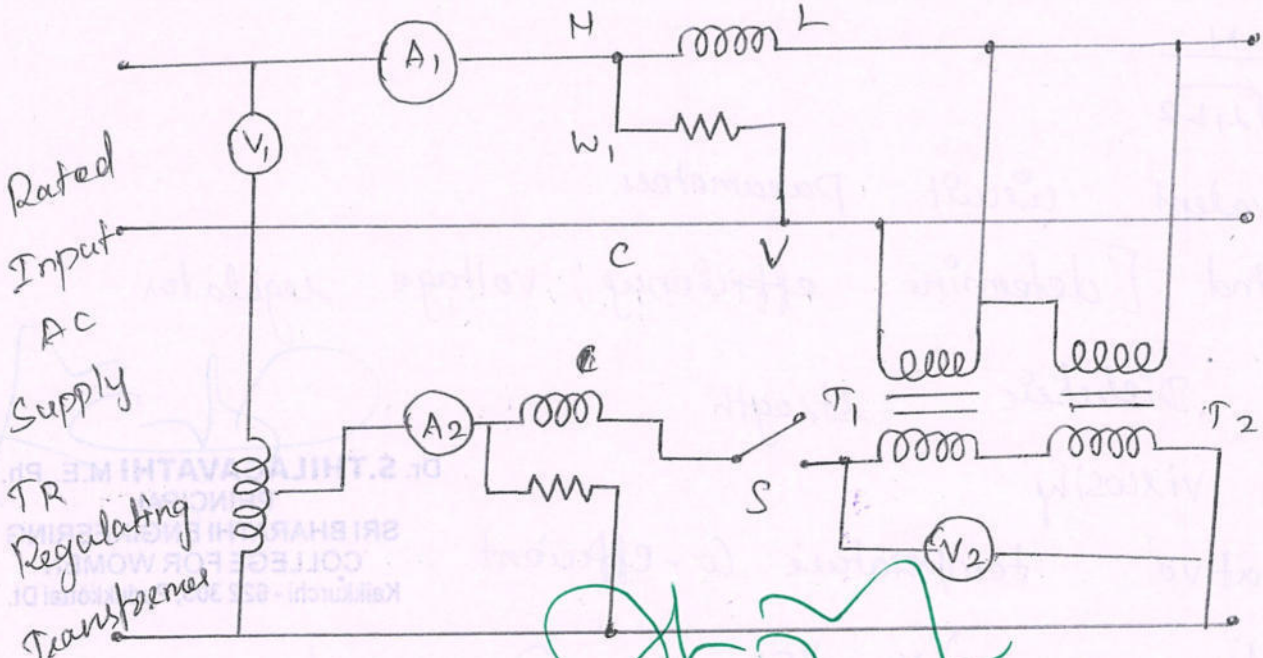
11.b $N_1 = 100$; $N_2 = 150$; $A = 125\,cm^2$; $L = 200cm$; $\mu_i = 2000$

$L = \frac{N\phi}{I}$ (or) $\frac{N^2}{S}$; $S = \frac{\mu_0 \mu_r}{\ell}$ $\mu_r = 1$ (air)

$\mu_0 = 4\pi \times 10^{-7}$ $\mu_i = 2000$

$M = \frac{N_1 \phi_{21}}{I_2}$ (or) $\frac{N_2 \phi_{12}}{I_1}$; $k = \frac{M}{\sqrt{L_1 L_2}}$

12.a Sumpner Test [Back - Back Test]



Part-C

13. $TCL = ECL + HL$

$= K_e (B_m)^2 f^2 t^2 . V + K_1 (B_m)^{1.6} f . V$

$= B . f^2 + A . f$

$TCL = Af + Bf^2$

$P_L = Af + Bf^2$

$1500 = 50f + B(50 \times 50)$

$A + 50B = 30$

$A + 75B = 40$

$25B = 10$

$B = 10/25 = 0.4$

$B = 0.4$ in $A + 75(0.4) = 40$

$A = 40 / (75 * 0.4)$

$A = 10$

$P_{loss} = Af + Bf^2$

$1500 = (10 * 50) + 0.4(50)^2 = 500 + 0.4(2500)$

$= 500 + 0.4(2500$

$AL = A * f = 10 * 50 = 500W$

$ECL = B * f^2 = 0.4 * (50)^2 = 1000W$

$P_{loss} = Af + Bf^2 = 3000 = 10(75) + (0.4)(75)^2$

$ECL = Bf^2 = 0.4(75)^2 = 2250W$

$HL = Af = 10 * 75 = 750W$

Faculty Incharge

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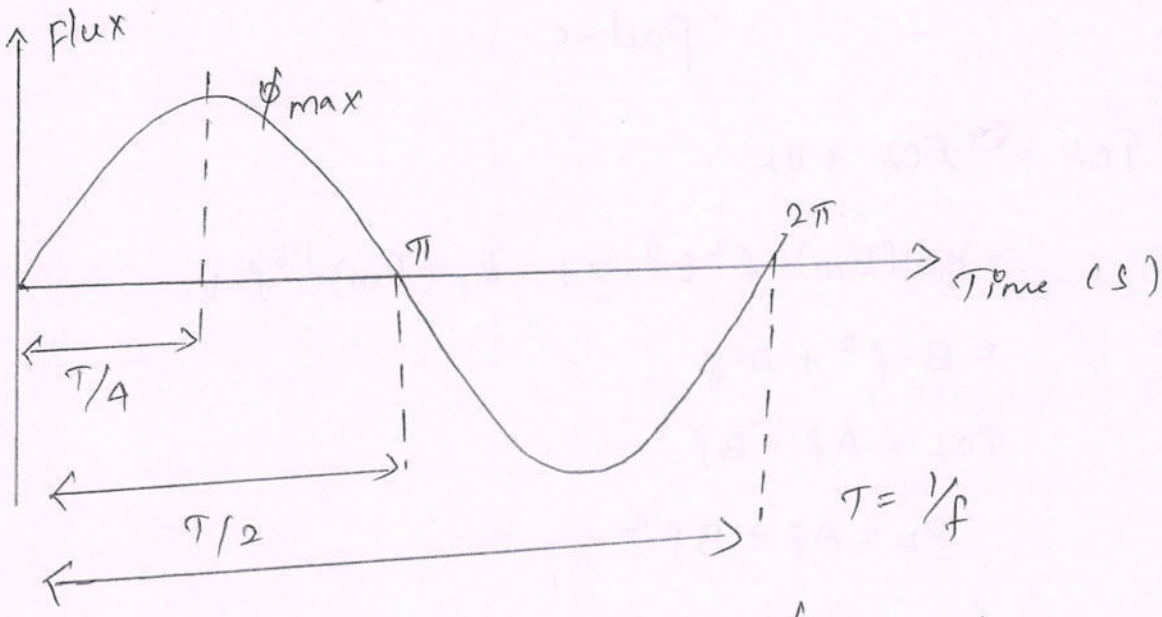
12.b.



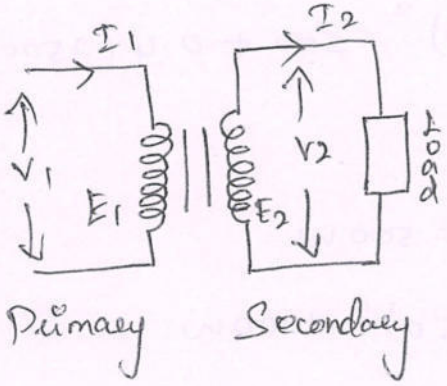
$\therefore$ Avg. rate of $\phi = \frac{\phi_m}{(1/4f)} = \text{wb/sec}$

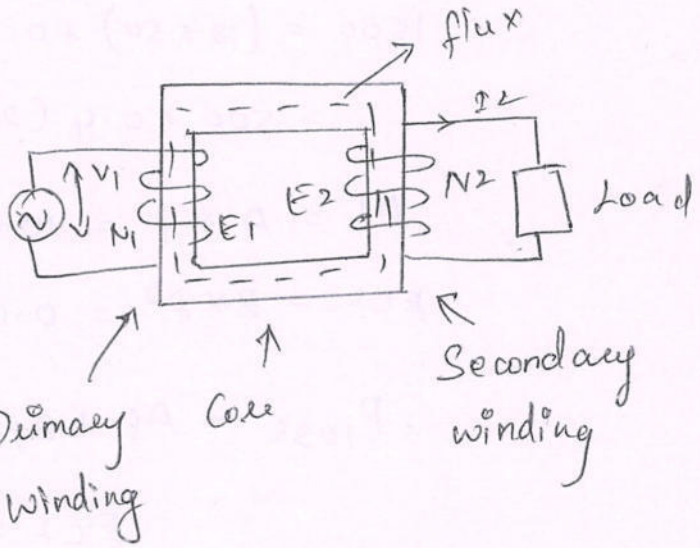
$$FF = \frac{\text{RMS Value}}{\text{Avg. Value}} = 1.11$$

$$\text{RMS Value} = FF \times \text{Avg. Value} = 1.11 \times 4f\phi_m = 4.44 f \phi_m \text{ Volts}$$

$$E_1 = 4.44 f \phi_m N_1 \text{ Volts}$$

$$E_2 = 4.44 f \phi_m N_2 \text{ Volts}$$





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Cycle Test Answer Book

Name	R.Kaviya			**Year/ Semester**	II/III
Reg No.	912620105302	**Date/Session**	25/9/21	**Department**	EEE
Course code	EE8301	**Course Title**	Electrical machines - I		
Cycle Test		**CT 1** ☑	**CT 2** ☐	**CT 3** ☐	**Model** ☐
Name and Signature of the Invigilator with date			25/9/21		

Instruction to the Student: Put tick mark to the question attended in the column against question.

Part A			Part B / Part C						Total Marks
Q. No.	✓	Marks	Q. NO.	✓	a Marks	✓	b Marks		
1	✓	2	11	✓	12				12
2	✓	2	12	✓	12				12
3	✓	2	13	✓	11		-		11
4	✓	2	14						
5	✓	2	15						
6	✓	2	16						
7	✓	1	Grand Total						35
8	✓	2	52/60 Grand Total						
9	✓	1							
10	✓	1							
Total		17							

Name and Signature of the Examiner with date: 26/9/21

To be filled by the examiner							
Course Outcomes	1	2	3	4	5	6	Total
Marks allotted	37	23					60
Marks Obtained	33	19					52

IQAC Audit - Remarks

2/10/21

Name and Signature of the IQAC member

(Mrs. B. Priya)

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC YEAR 2021 – 2022 (ODD SEMESTER)

STUDENTS MARK STATEMENT- CO BASED

CYCLE TEST-I

SUBJECT CODE &TITLE: EE8301 - Electrical Machines-I

YEAR/SEM: II/III **MONTH & YEAR:** September & 2021

S.NO	REG NO	STUDENT NAME	C204.1 (37)	C204.2 (23)	TOTAL (60)	TOTAL (100)
1.	912620105001	KAYALVIZHI K	35	20	55	92
2.	912620105002	RAMADEVI S	16	14	30	50
3.	912620105003	SRINANTHANA S	33	21	54	90
4.	912620105301	KALPANA T	09	05	13	22
5.	912620105302	KAVIYA R	34	18	52	86
6.	912620105303	KOPPERUNDEVI S	31	19	50	84
7.	912620105304	NARMATHA DEVI K	–	–	AB	AB
8.	912620105305	SRIBHARATHI S	03	05	08	13

MARKS RANGE:

<20	20-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
01	01	–	01	–	–	–	02	02

Total No. of Candidates Present	07
Total No. of Candidates Absent	01
Total No. of Students Pass	05
Total No. of Students Fail	02
Percentage of Pass	71.4 %

FACULTY INCHARGE **HoD/EEE** **PRINCIPAL** 21/5/21

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ROOT CAUSE ANALYSIS

Name of the Faculty : Mrs.B.PRIYA
Course Code & Name: EE8301-Electrical Machines-I
Degree & Program : B.E & EEE
Semester : III
Cycle Test : I /II/III
Exam/Month & Year : September & 2021
Target : 100 %
Achieved : 71.42 %

S.NO	REG NO	NAME OF THE STUDENT	CAUSES FOR FAILURE	CORRECTIVE ACTION TAKEN
1.	912620105305	S. SRI BHARATHI	Health issue	Insist to take care of health & Counselled to prepare well for exam
2.	912620105301	T. KALPANA	Did not prepare well for exam	Insisted to prepare & do the cycle test. Counselled regarding importance of cycle Test
3.				
4.				
5.				
6.				

Signature of the Faculty Member

Signature of the HoD/EEE

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Circular Date: 30.09.2021

Retest for first cycle test will be conducted from 04.10.2021 to 09.10.2021 for the III, V & VII semester (II, III & IV year) students.

The following instructions are to be followed by the faculty members.

- Total marks for which the question paper to be set will be for 50 marks. **(PART A** 5X2=10, **PART B** 2X13=26 **& PART C** 1X14=14)
- It is the responsibility of the **question paper** setter to take the Xerox copies of the required number of question papers.
- Concerned Faculty members are requested to conduct the examination as per the scheduled and handover the valued answer scripts to the students on or before11.10.2021.

PRINCIPAL

30/09/21

Cc:

- All faculty
- Exam cell
- Office file

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Circular

Date: 30.09.2021

Retest for first cycle test will be conducted from 4.10.2021 to 09.10.2021 for the III semester (II year) B.E students for 50 marks as per the time table given below. Students are directed to prepare well and score good marks.

Date	04.00 pm -05.30 pm
04.10.2021	MA8353-Transforms and Partial Differential Equations (CIVIL/EEE) EC8393-Fundamentals of Data Structures in C (ECE) EC8395-Communication Engineering(CSE)
05.10.2021	CE8391-Construction Materials (CIVIL) EC8351-Electronic Circuits I (ECE) ME8792-Power Plant Engineering (EEE)
06.10.2021	CE8301-Steength of Materials-I (CIVIL) CS8351-Digital Principles and System Design (CSE) EC8352- Signals and Systems (ECE) EC8353-Electron Devices and Circuits(EEE)
07.10.2021	CE8351-Surveying(CIVIL) CS8391-Data Structures-(CSE) EC8391-Control System Engineering (ECE) EE8301-Electrical Machines-I(EEE)
08.10.2021	CE8392-Engineering Geology (CIVIL) CS8392-Object Oriented Programming(CSE) EC8392-Digital Electronics (ECE) EE8391-Electromagnetic Theory(EEE)
09.10.2021	CE8302-Fluids Mechanics(CIVIL) MA8351-Discrete Mathematics (CSE) EC8691- Linear Algebra and Partial Differential Equations (ECE) EE8351-Digital Logic Circuits(EEE)

PRINCIPAL

30/9/21

Cc:

- All II year B.E Classes
- All faculty
- Exam cell
- Notice Board
- Office file

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Register Number:											

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CYCLE TEST - I RETEST			Date/Session	7.10.2021	Marks	50
Course code	EE8301	Course Title	ELECTRICAL MACHINES I			
Regulation	2017	Duration	90 minutes	Academic Year	2021 - 2022	
Year	II	Semester	III	Department	EEE	

COURSE OUTCOMES

C204.1	Ability to analyses the magnetic-circuits.
C204.2	Ability to acquire the knowledge in constructional details of transformers.
C204.3	Ability to comprehend the concepts of electromechanical energy conversion
C204.4	Ability to gain the knowledge in working principles of DC Generator
C204.5	Ability to infer the knowledge in working principles of DC Motor
C204.6	Ability to summarize the knowledge in various losses taking place in D.C. Machines

Q.No.	Question	CO	BTS
	PART A **(Answer all the Questions 10 x 2 = 20 Marks)**		
1	Outline the factors on which eddy current loss depends.	C204.1	K2
2	Define mutual-inductance.	C204.1	K1
3	Formulate the concept of self-inductance.	C204.1	K6
4	List the application of equivalent circuit of transformer?	C204.2	K2
5	Defend the reason behind copper saving in auto transformer.	C204.2	K5
	PART B **(Answer all the Questions 2 x 13 = 26 Marks)**		
06a	With the circuit diagram explain the sumpner test and how to obtain the efficiency of a transformer	C204.2	K6
	OR		
06b	Explain in detail the operation of transformer. Derive its EMF equation	C204.2	K6
07a	Explain the mmf in a single coil winding	C204.3	K2
	OR		
07b	Explain the mmf in a distributed winding	C204.3	K2
	PART C **(Answer all the Questions 1 x 14 = 14 Marks)**		
08	Explain in detail AC Operation of magnetic circuits.	C204.1	K1

7/10/21

Course Faculty

Mrs. B. PRIYA

(Name /Sign / Date)

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7/10/21

HoD

Mrs. B. PRIYA

(Name /Sign / Date)

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ATTENDANCE SHEET- RETEST FOR CYCLE TEST -I

Name of the Faculty : Mrs. B. Priya

Course Code & Name : EE8301 & Electrical Machines - I

Academic Year : 2021-2022 / ODD

Degree & Program : B.E/EEE **Year/Semester: II/III**

S.NO	REG NO	STUDENT NAME	SIGNATURE
1.	912620105002	RAMADEVI S	
2.	912620105301	KALPANA T	
3.	912620105304	NARMATHA DEVI K	
4.	912620105305	SRIBHARATHI S	

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC YEAR 2021 – 2022 (ODD SEMESTER)

STUDENTS MARK STATEMENT- CO BASED

RETEST - CYCLE TEST-I

SUBJECT CODE &TITLE: EE8301 – Electrical Machines - I

YEAR/SEM: II/III **MONTH & YEAR:** October & 2021

S.NO	REG NO	STUDENT NAME	C204.1 (20)	C204.2 (17)	C204.3 (13)	TOTAL (50)	TOTAL (100)
1.	912620105002	RAMADEVI S	18	16	11	45	90
2.	912620105301	KALPANA T	15	14	11	40	80
3.	912620105304	NARMATHA DEVI K	17	11	12	40	80
4.	912620105305	SRIBHARATHI S	16	15	09	41	82

MARKS RANGE:

<20	20-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
—	—	—	—	—	—	02	02	—

Total No. of Candidates Present	04
Total No. of Candidates Absent	NIL
Total No. of Students Pass	04
Total No. of Students Fail	NIL
Percentage of Pass	100 %

FACULTY INCHARGE **HoD/EEE** **PRINCIPAL**

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC YEAR 2021 – 2022 (ODD SEMESTER)

FINAL INTERNAL STUDENTS MARK STATEMENT (Out of 20)

SUBJECT CODE &TITLE: EE8301 ELECTRICAL MACHINES I

YEAR/SEM: II/III

S.NO	REG NO	STUDENT NAME	TOTAL (20)
1.	912620105001	KAYALVIZHI K	18
2.	912620105002	RAMADEVI S	16
3.	912620105003	SRINANTHANA S	16
4.	912620105301	KALPANA T	14
5.	912620105302	KAVIYA R	17
6.	912620105303	KOPPERUNDEVI S	18
7.	912620105304	NARMATHA DEVI K	16
8.	912620105305	SRIBHARATHI S	16

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC YEAR 2021 – 2022 (ODD SEMESTER)

ANNA UNIVERSITY RESULT STATEMENT NOV/DEC-2021

SUBJECT CODE &TITLE: EE8301 ELECTRICAL MACHINES I

YEAR/SEM: II/III

S.NO	REG NO	STUDENT NAME	GRADE
1.	912620105001	KAYALVIZHI K	A+
2.	912620105002	RAMADEVI S	A+
3.	912620105003	SRINANTHANA S	A+
4.	912620105301	KALPANA T	UA
5.	912620105302	KAVIYA R	A+
6.	912620105303	KOPPERUNDEVI S	O
7.	912620105304	NARMATHA DEVI K	A
8.	912620105305	SRIBHARATHI S	A

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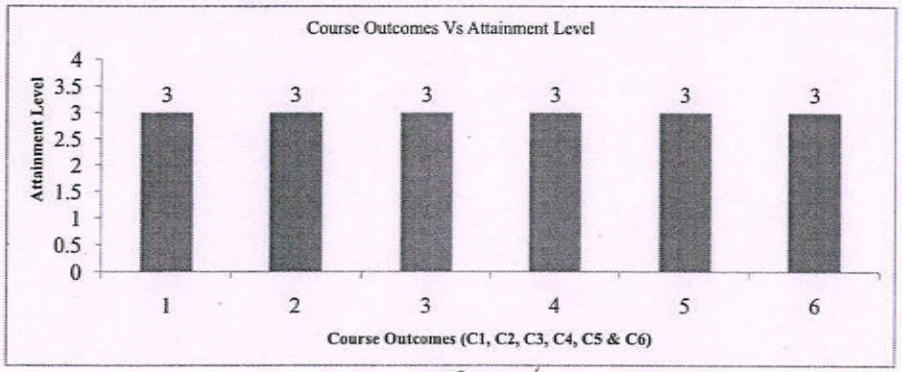
Department of Electrical and Electronics Engineering

Internal Assessment -Attainment of Course Outcomes (Through Direct Assessment)

ACADEMIC YEAR - 2021 - 2022		BATCH	2020 - 2024
COURSE CODE/TITLE	EE8301 / ELECTRICAL MACHINES - I	COURSE OUTCOME	1 2 3 4 5 6
YEAR/SEM	II/III	TARGET(%)	65 65 65 65 65 65
COURSE COORDINATOR	Mrs. B.PRIYA	TOTAL STRENGTH	8

ATTAINMENT LEVEL	Level	Range
	1	UP TO 60% of the students scored more than target
	2	61 - 79% of the students scored more than target
	3	80% & ABOVE of the students scored more than target

S.NO	REG NO	NAME OF THE STUDENT	IAT 1 - MARKS ALLOTED						IAT 2 - MARKS ALLOTED						IAT 3 - MARKS ALLOTED						Assignment / Mini Project /Tutorial / Seminar						TOTAL COURSE OUTCOME					
			C1	C2	C3	C4	C5	C6	C1	C2	C3	C4	C5	C6	C1	C2	C3	C4	C5	C6	C1	C2	C3	C4	C5	C6	C1	C2	C3	C4	C5	C6
			60	40							40	60							60	40		10	10			10	60	50	50	60	60	50
1	912620105001	KAYALVIZHI K	55	37							34	52							55	37		7	8			8	55	44	42	52	55	45
2	912620105002	RAMADEVI S	54	36							33	49							42	28		8	8			8	54	44	41	49	42	36
3	912620105003	SRINANTHANA S	54	36							33	50							44	29		8	8			8	54	44	41	50	44	37
4	912620105301	KALPANA T	48	32							32	48							31	20		7	8			7	48	39	40	48	31	27
5	912620105302	KAVIYA R	52	34							33	49							55	37		9	7			8	52	43	40	49	55	45
6	912620105303	KOPPERNDEVI S	50	34							35	53							55	36		9	9			9	50	43	44	53	55	45
7	912620105304	NARMATHADEVI K	48	32							32	49							44	30		9	8			9	48	41	40	49	44	39
8	912620105305	SRIBHARATHI S	49	33							33	50							43	29		9	7			9	49	42	40	50	43	38



	C1	C2	C3	C4	C5	C6
CO's Target Value	39.0	32.5	32.5	39.0	39.0	32.5
No. of Students scored above CO's Target Value	8	8	8	8	7	7
Percentage of Students scored above Target	100.0	100.0	100.0	100.0	87.5	87.5
CO Attainment	3	3	3	3	3	3
CO attainment Values to plot the Graph	3	3	3	3	3	3

Faculty Incharge

Dr. S.THILAGAVATHI M.E.,Ph.D.,
PRINCIPAL
SRI BHARATHI ENGINEERING
COLLEGE FOR WOMEN
Kaikkurchi - 622 303, Pudukkottai Dt.

HOD/EEE

HOD EEE
SRI BHARATHI ENGINEERING
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KAIKKURICHI,

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai)

DEPARTMENT OF EEE

COURSE OUTCOME ATTAINMENT - UNIVERSITY EXAMINATION

ACADEMIC YEAR : 2021 - 2022 (ODD SEM)

YEAR/SEM : II/III Batch: 2020-2024

SUBJECT : EE8301 - ELECTRICAL MACHINES - I

CO Attainment Level: 1 - (UPTO 60%) 2- (61%-79%) 3-(80% and Above)

TOTAL STRENGTH : 8

S.NO	Register No	NAME	Univ. Grade
1	912620105001	KAYALVIZHI K	A+
2	912620105002	RAMADEVI S	A+
3	912620105003	SRINANTHANA S	A+
4	912620105301	KALPANA T	UA
5	912620105302	KAVIYA R	A+
6	912620105303	KOPPERNDEVI S	O
7	912620105304	NARMATHADEVI K	A
8	912620105305	SRIBHARATHI S	A

No. of O Grade	1	1
No. of A+ Grade	4	4
No. of A Grade	2	2
No. of B+ Grade	0	0
No. of B Grade	0	0
No. of U Grade	0	0
No. of UA Grade	1	1
Target for course outcome Attainment	60	8
No of students above the target	7	
CO-Attainment University (%)	87.50	

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Overall Attainment Sheet – COs - POs & PSOs attainment calculation

CO	CO-Attainment Internal (CO-INT) (Avg. Attainment of All section) (%)	CO-Attainment University (CO-UNI) (Avg. Attainment of All section) (%)	Direct CO Attainment (0.20xCO-INT + 0.80xCO-UNI) (%)	CO Attainment Level
C204.1	100.0	87.50	90.0	3
C204.2	100.0	87.50	90.0	3
C204.3	100.0	87.50	90.0	3
C204.4	100.0	87.50	90.0	3
C204.5	87.5	87.50	87.5	3
C204.6	87.5	87.50	87.5	3

Expected CO-PO Level

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C204.1	3	3	2	1	-	-	-	-	-	1	-	1	3	2	-
C204.2	3	3	2	1	-	-	-	-	-	1	-	1	3	1	-
C204.3	3	3	2	1	-	-	-	-	-	1	-	1	3	1	-
C204.4	3	3	2	1	-	-	-	-	-	1	-	1	3	3	-
C204.5	3	3	2	1	-	-	-	-	-	1	-	1	3	3	-
C204.6	3	3	2	1	-	-	-	-	-	1	-	1	3	3	-
C204	3	3	2	1	-	-	-	-	-	1	-	1	3	2	-

PO Attainment Level

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C204.1	3	3	2	1	-	-	-	-	-	1	-	1	3	2	-
C204.2	3	3	2	1	-	-	-	-	-	1	-	1	3	1	-
C204.3	3	3	2	1	-	-	-	-	-	1	-	1	3	1	-
C204.4	3	3	2	1	-	-	-	-	-	1	-	1	3	3	-
C204.5	3	3	2	1	-	-	-	-	-	1	-	1	3	3	-
C204.6	3	3	2	1	-	-	-	-	-	1	-	1	3	3	-
C204	3	3	2	1	-	-	-	-	-	1	-	1	3	2	-

Attainment of POs and PSOs:

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C204	3	3	2	1	-	-	-	-	-	1	-	1	3	2	-
Attainment	3	3	2	1	-	-	-	-	-	1	-	1	3	2	-

Comments by Program Coordinator	1. 2.
Remarks by HoD	

Name and Signature
of the Faculty Member

(Mrs. B. PRIYA)

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PUDUKKOTTAI - 622 303.