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 : **2019-2023**

Academic Year : **2020-2021 / EVEN**

Program : **ELECTRICAL AND ELECTRONICS ENGINEERING**

Year & Semester : **2nd Year / 4th Semester**

Course Code : **EE8401** **NBA Course Code: C210**

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

Faculty Incharge : **A. PRIMROSE, AP / EEE**

A. Primrose

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
Kaikkurichi - 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					
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			Yes		
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	A.Brinsose	A.Brinsose	A.Brinsose	A.Brinsose	A.Brinsose
	Signature of HoD					

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DEPARTMENT OF EEE

INDIVIDUAL STAFF WORKLOAD (2020-2021) EVEN SEMESTER

S. NO.	NAME OF THE STAFF	SUBJECTS HANDLED	YEAR & DEPT	HOURS ALLOCATED	TOTAL HOURS
1.	Mrs.B.PRIYA	**EE8691**-Embedded Systems	III EEE	5	18
		EE8811-Project Work	IV EEE	10	
2.	Mrs.A.PRIMROSE	**EE8002**-Design of Electrical Apparatus	III EEE	5	10
		EE8402- Electrical Machines-II	II EEE	5	
3.	Mrs. SUSILADEVI.S	**IC8451**-Control Systems	II EEE	5	10
		EE8017-High Voltage Direct Current Transmission	IV EEE	5	
4.	Mr. SATHYARAJ.J	**EE8451**-Linear Integrated Circuits & Applications	II EEE	4	12
		EE8005-Special Electrical Machines	III EEE	5	
		EE8411-Electrical Machines-II Laboratory	II EEE	3	
5.	Ms.K.A.MUTHULAKSHMI	**BE8255**-Basic Electrical, Electronics Measurement Engineering	I CIVIL	5	10
		EE8412-Technical Seminar	II EEE	2	
		GE8261-Engineering Practices Laboratory	I ECE	3	
6.	Mrs.R.AKILANDESWARI	**EE8602**- Protection and Switchgear	III EEE	5	11
		EE8661- Power Electronics and Drives Laboratory	III EEE	3	
		GE8261-Engineering Practices Laboratory	I EEE	3	
7.	Ms.S.DEVAKI	**EE8015**-Electric Energy Generation, Utilization and Conservation	IV EEE	5	13
		EE8251-Circuit Theory	I EEE	5	
		EE8261-Electric Circuits Laboratory	I EEE	3	
8.	Ms.M.ABIRAMI	**EE8403**-Measurements and Instrumentation	II EEE	4	11
		BE8254-Basic Electrical and Instrumentation Engineering	I ECE	4	
		GE8261-Engineering Practices Laboratory	I CSE	3	

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9.	Mrs.PL.KAVITHA	EE8402-Transmission and Distribution	II EEE	5	08
		GE8261-Engineering Practices Laboratory	I CIVIL	3	
10.	Mrs. R.RAGADHARSHINI	EE8601- Solid State Drives	III EEE	5	13
		BE8251-Basic Electrical and Electronics Engineering	I CSE	5	
		EE8611-Mini Project	III EEE	3	

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Department of EEE

COURSE PLAN

Sub.Code	EE8401	Branch/Year/Sem:	EEE/ II/ IV
Sub.Name	ELECTRICAL MACHINES II	Batch	: 2019-2023
Staff Name	A. PRIMROSE	Academic Year	: 2020-2021(EVEN)

COURSE OBJECTIVE

To impart knowledge on the following Topics

- Construction and performance of salient and non – salient type synchronous generators.
- Principle of operation and performance of synchronous motor.
- Construction, principle of operation and performance of induction machines.
- Starting and speed control of three-phase induction motors.
- Construction, principle of operation and performance of single-phase induction motors and special machines

TEXT BOOKS

T1. A.E. Fitzgerald, Charles Kingsley, Stephen. D. Umans, 'Electric Machinery', Mc Graw Hill publishing Company Ltd, 6th Education 2017.

T2. Vincent Del Toro, 'Basic Electric Machines' Pearson India Education, 2016.

T3. Stephen J. Chapman, 'Electric Machinery Fundamentals'4th edition, McGraw Hill Education Pvt. Ltd, 4th Edition 2017.

REFERENCES

R1. D.P. Kothari and I.J. Nagrath, 'Electric Machines', McGraw Hill Publishing Company Ltd, 5th Edition 2022

R2. P.S. Bhimbhra, 'Electrical Machinery', Khanna Publishers, edition 2, 2021.

R3. M.N. Bandyo padhyay, Electrical Machines Theory and Practice, PHI Learning PVT LTD., New Delhi, 2011.

R4. B.R.Gupta, 'Fundamental of Electric Machines' New age International Publishers,3rd Edition, Reprint 2015.

R5. Murugesh Kumar, 'Electric Machines', Vikas Publishing House Pvt. Ltd, First edition 2010.

TEACHING METHODOLOGIES:

- BB - BLACK BOARD
- PPT - POWER POINT PRESENTATION

WEB SOURCE:

1. **https://www.youtube.com/watch?v=dZyO5gcWP-o**
2. **https://www.youtube.com/watch?v=edJFTap0zYw&list=PLbRMhDVUMngcDrGXlt-hX-ekpldUlC2b6&index=82**
3. **https://www.youtube.com/@lecturesinelectricalengine4298**

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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 SYNCHRONOUS GENERATOR						
1	Constructional details – Types of rotors	R5	204	BB	1	1
2	Winding factors- EMF equation	R5	224	BB	1	2
3	Synchronous reactance	R5	235	BB	2	4
4	Armature reaction	R5	237	BB	1	5
5	Phasor diagrams of non-salient pole synchronous generator connected to infinite bus	R5	246	BB	2	7
6	Synchronizing and parallel operation – Synchronizing torque	R5	299	BB	2	9
7	Voltage regulation – EMF, MMF, ZPF and A.S.A method	R5	265	BB	1	10
8	Two reaction theory –slip test - short circuit transients	R5	413	BB	1	11
9	Capability Curves.	R5	350	BB	1	12
10	Tutorial	R5	355	BB	1	13
LEARNING OUTCOME At the end of unit, Students should be able to • Interpret the working principle behind the operation of synchronous generator.						
UNIT – II SYNCHRONOUS MOTOR						
1	Principle of Operation – Torque Equation	R5	357	BB	1	14
2	Operation on Infinite Bus Bars	R5	331	BB	2	16
3	V And Inverted V Curves	R5	380	BB	1	17
4	Power Input and Power Developed Equations	R5	370	BB	1	18
5	Starting Methods	R5	358	BB	2	20
6	Constant Excitation and Constant Power Developed- Hunting	R5	380	BB	2	22
7	Natural Frequency of Oscillations	R5	355	BB	1	23
8	Damper Windings- Synchronous Condenser.	R5	358	BB	2	25
9	Tutorial	R5	559	BB	1	26

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10	**Role of Iot In Speed Control of Ac Machines**	WEB	-	PPT	1	27

LEARNING OUTCOME

At the end of unit, Students should be able to

- Explain the construction and working principle of synchronous motor.
- Interpret various characteristics of synchronous motor.

UNIT – III THREE PHASE INDUCTION MOTOR

1	Constructional details – Types of rotors	R5	4 – 11	VIDEO	1	28
2	Principle of operation	R5	15	BB	2	30
3	Slip	R5	28	BB	1	31
4	cogging and crawling	R5	117, 119	BB	1	32
5	Equivalent circuit	R5	61	BB	1	33
6	Torque-Slip characteristics	R5	37	BB	1	34
7	Condition for maximum torque	R5	22	BB	1	35
8	Load test - No load and blocked rotor tests	R5	83	BB	1	36
9	Double cage induction motors – Induction generators	R5	120	BB	1	37
10	Synchronous induction motor	R5	128	BB	2	38
11	Tutorial	R5	130	BB	1	39

LEARNING OUTCOME

At the end of unit, Students should be able to

- Explain the construction and working principle of three phase induction motor.
- Interpret various characteristics of three phase induction motor.

UNIT – IV STARTING AND SPEED CONTROL OF THREE PHASE INDUCTION MOTOR

1	Need for starting	R5	139	VIDEO	1	40
2	Types of starters	R5	140	BB	3	43
3	Speed control – Voltage control, Frequency control and pole changing	R5	158	BB	3	46
4	Cascaded Connection-V/f	R5	145	BB	1	47
5	Slip power recovery Scheme	R5	157	BB	2	49
6	Braking of three phase induction motor	R5	173	BB	2	51
7	**Role of Iot In Speed Control of AC Machines - CBS**	WEB	-	PPT	1	52

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LEARNING OUTCOME At the end of unit, Students should be able to • Acquire knowledge on speed control of induction motor						
UNIT – V SINGLE PHASE INDUCTION MOTORS AND SPECIAL MACHINES						
1	Constructional details of single-phase induction motor	R5	183	BB	1	53
2	Double field revolving theory	R5	184	BB	1	54
3	Equivalent circuit – No load and blocked rotor test – Performance analysis –	R5	187	BB	1	55
4	Capacitor-start capacitor run Induction motor	R5	194	BB	1	56
5	Shaded pole induction	R5	195	BB	1	57
6	Linear induction motor	R5	420	BB	2	59
7	Repulsion motor - Hysteresis motor - AC series motor	R5	425	PPT	3	62
8	Stepper motors - introduction to magnetic levitation systems	R5	427	PPT	2	64
9	Tutorial	R5	430	BB	1	65
10	**Role of Iot In Speed Control of AC Machines - CBS**	WEB	-	PPT	1	66
LEARNING OUTCOME At the end of unit, Students should be able to • Describe the working principle of various special electrical machines.						

COURSE OUTCOME

Upon the successful completion of the course, students will have the:

C210.1: Ability to construe the construction and working principle of Synchronous generator
C210.2: Ability to interpret MMF curves and armature windings
C210.3: Ability to acquire knowledge on Synchronous motor
C210.4: Ability to infer the construction and working principle of Three phase Induction Motor.
C210.5: Ability to construe the construction and working principle of Special Machines.
C210.6: Ability to predetermine the performance characteristics of Synchronous Machines.

CONTENT BEYOND THE SYLLABUS: **ROLE OF IOT IN SPEED CONTROL OF AC 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	17.3.2021	17.4.2021	13.5.2021

ASSIGNMENT NUMBER	UNIT	DESCRIPTIVE QUESTIONS/TOPIC
1	I, II	1. What is the relation between electrical degree and mechanical degree? 2. Justify that short-pitch winding is preferred over full pitch winding? 3. Why a 3-phase synchronous motor will always run at synchronous speed? 4. Mention the need for starters in synchronous motors 5. Discuss are the causes of hunting?
2	III	1. How can the direction of rotation of three phase induction motor can be reversed? 2. At what value of slip does the torque developed is maximum? 3. State the conditions of maximum torque developed in three phases induction motor? 4. How do change in supply voltage and frequency affect the 5. performance of a 3-phase induction motor?
3	IV, V	1. Why single-phase induction motor is not a self-starting? 2. Is single-phase induction motors have low PF? Enumerate the reasons 3. What will be the direction of rotation of a shaded pole single

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		phase induction motor? 4. How can the direction of a capacitor run motor be reversed?

A. Primrose.

PREPARED BY
A. PRIMROSE
AP/EEE

12/2/21

VERIFIED BY
Mrs. B. PRIYA
HOD/EEE

HOD EEE
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APPROVED
BY 12/02/21
PRINCIPAL

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DEPARTMENT OF ELECTRICAL AND ELECRONICS ENGINEERING

EE8401 ELECTRICAL MACHINES – II L T P C

2 2 0 3

OBJECTIVES:

To impart knowledge on the following Topics

- Construction and performance of salient and non – salient type synchronous generators.
- Principle of operation and performance of synchronous motor.
- Construction, principle of operation and performance of induction machines.
- Starting and speed control of three-phase induction motors.
- Construction, principle of operation and performance of single-phase induction motors and special machines.

UNIT I SYNCHRONOUS GENERATOR 6+6

Constructional details – Types of rotors –winding factors- emf equation – Synchronous reactance – Armature reaction – Phasor diagrams of non-salient pole synchronous generator connected to infinite bus--Synchronizing and parallel operation – Synchronizing torque -Change of excitation and mechanical input- Voltage regulation – EMF, MMF, ZPF and A.S.A methods – steady state power- angle characteristics– Two reaction theory –slip test -short circuit transients - Capability Curves

UNIT II SYNCHRONOUS MOTOR 6+6

Principle of operation – Torque equation – Operation on infinite bus bars - V and Inverted V curves – Power input and power developed equations – Starting methods – Current loci for constant power input, constant excitation and constant power developed-Hunting – natural frequency of oscillations – damper windings-synchronous condenser.

UNIT III THREE PHASE INDUCTION MOTOR 6+6

Constructional details – Types of rotors –- Principle of operation – Slip –cogging and crawling- Equivalent circuit – Torque-Slip characteristics - Condition for maximum torque –Losses and efficiency – Load test - No load and blocked rotor tests - Circle diagram –Separation of losses – Double cage induction motors –Induction generators – Synchronous induction motor.

UNIT IV STARTING AND SPEED CONTROL OF THREE PHASE INDUCTION MOTOR 6+6

Need for starting – Types of starters – DOL, Rotor resistance, Autotransformer and Star delta starters – Speed control – Voltage control, Frequency control and pole changing – Cascaded connection-V/f control – Slip power recovery scheme-Braking of three phase induction motor: Plugging, dynamic braking and regenerative braking.

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UNIT V SINGLE PHASE INDUCTION MOTORS AND SPECIAL MACHINES 6+6

Constructional details of single phase induction motor – Double field revolving theory and operation – Equivalent circuit – No load and blocked rotor test – Performance analysis – Starting methods of single-phase induction motors – Capacitor-start capacitor run Induction motor- Shaded pole induction motor - Linear induction motor – Repulsion motor - Hysteresis motor - AC series motor- Servo motors- Stepper motors - introduction to magnetic levitation systems.

TOTAL: 60 PERIODS

OUTCOMES:

- Ability to understand the construction and working principle of Synchronous Generator
- Ability to understand MMF curves and armature windings.
- Ability to acquire knowledge on Synchronous motor.
- Ability to understand the construction and working principle of Three phase Induction Motor
- Ability to understand the construction and working principle of Special Machines
- Ability to predetermine the performance characteristics of Synchronous Machines.

TEXT BOOKS:

1. A.E. Fitzgerald, Charles Kingsley, Stephen. D. Umans, 'Electric Machinery', Mc Graw Hill publishing Company Ltd, 2003.
2. Vincent Del Toro, 'Basic Electric Machines' Pearson India Education, 2016.
3. Stephen J. Chapman, 'Electric Machinery Fundamentals'4th edition, McGraw Hill Education Pvt. Ltd, 2010.

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2. P.S. Bhimbhra, 'Electrical Machinery', Khanna Publishers, 2003.
3. M.N. Bandyopadhyay, Electrical Machines Theory and Practice, PHI Learning PVT LTD., New Delhi, 2009.
4. B.R.Gupta, 'Fundamental of Electric Machines' New age International Publishers,3rd Edition , Reprint 2015.
5. Murugesh Kumar, 'Electric Machines', Vikas Publishing House Pvt. Ltd, 2002.
6. Alexander S. Langsdorf, 'Theory of Alternating-Current Machinery', McGraw Hill Publications, 2001

A. Primrose

Signature of Faculty

HoD/EEE

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Identification of Curricular Gap & Content Beyond Syllabus (CBS)

Name of the Faculty : Mrs. A. PRIMROSE Course Code & Name: EE8401 & ELECTRICAL MACHINES II

Degree & Program: B.E. /EEE Semester: IV Academic Year: 2020 -2021 EVEN

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
C210.1	3	3	2	2	-	-	-	-	-	2	-	1	3	2	-
C210.2	3	3	2	2	-	-	-	-	-	2	-	1	3	1	-
C210.3	3	3	2	2	-	-	-	-	-	2	-	1	3	1	-
C210.4	3	3	2	2	-	-	-	-	-	2	-	1	3	3	-
C210.5	3	3	2	2	-	-	-	-	-	2	-	1	3	3	-
C210.6	3	3	2	2	-	-	-	-	-	2	-	1	3	3	-
C210	3	3	2	2	-	-	-	-	-	2	-	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	C210.1, C210.2, C210.3, C210.4, C210.5 & C210.6 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
C210.1	3	3	2	2	-	-	1*	-	-	2	-	1	3	2	-
C210.2	3	3	2	2	-	-	1*	-	-	2	-	1	3	1	-
C210.3	3	3	2	2	-	-	1*	-	-	2	-	1	3	1	-
C210.4	3	3	2	2	-	-	-	-	1*	2	-	1	3	3	-
C210.5	3	3	2	2	-	-	-	-	1*	2	-	1	3	3	-
C210.6	3	3	2	2	-	-	-	-	1*	2	-	1	3	3	-
C210	3	3	2	2	-	-	1*	-	1*	2	-	1	3	2	-

A. Primrose.

Signature of the Faculty Incharge

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DEPARTMENT OF ELECTRICAL AND ELECRONICS ENGINEERING

Assignment Question Paper

Assignment – 01				Date of Issue:	10.3.21	Marks	10
Course code	EE8401	Course Title	ELECTRICAL MACHINES II				
Year	II	Semester/Section	IV	Date of Submission:	17.3.21		

Q. No	Questions	CO
1.	What is the relation between electrical degree and mechanical degree?	CO210.2
2.	Why short-pitch winding is preferred over full pitch winding?	CO210.1
3.	Why a 3-phase synchronous motor will always run at synchronous speed?	C0210.3
4.	Mention the need for starters in synchronous motors	C0210.3
5.	What are the causes of hunting?	C0210.3

A. Rimrose.

Name and Signature of the Faculty Incharge

HoD/EEE

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PUDUKKOTTAI - 622 303.

Dr. S.THILAGAVATHI M.E.,Ph.D.,
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Assignment - I

19/3/21

S. Abinaya
9126191500 2
II - year - IV - Sem

8/10

EE8401 - Electrical Machines - II

1. Relation between Electrical degree and Mechanical degree

Electrical angle = P/2 (Mechanical angle)

$\theta_e = (P/2) \times \theta_m$

2. Advantage of full pitch winding over Short pitch Winding

* Reduces the Harmonic EMf and waveform is include (improve)

* It dimishes the Armature reaction

* Even distribution of conductors helps for better cooling.

* The core full utilized as the conductors are distributed over the Slots on the armature periphery.

3. Three phase Synchronous Motor always runs at Synchronous speed due do Magnetic locking between Stator and Rotor

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$$N_s = \frac{120 f}{P}$$

$f \rightarrow$ frequency Hz

$P \rightarrow$ Number of poles

If $f = 50$ Hz and $P = 4$

$$N_s = \frac{120 \times 50}{4} = 1500 \text{ rpm}$$

---

4 Need of Starters in Synchronous Motor

* General Voltage equation is given by

$$V = e_B + I_a R_a$$

With speed = 0 at the time of starting Back EMf is zero. The armature resistance is very low hence winding need to carry a current of 20 time of rated current which may burn the windings hence in order to protect the motor three by the winding starts are used

---

5. What are causes of hunting

* Sudden change of Mechanical load on the Motor

* Sudden change in the field current

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* Cyclic Variation of load ~~dark~~ Torque
* fault occuring in the power Syster to which the Motor is connected.
* It May load to loss of Syncheonisum
* Large Mechanical stress May develop in the Motor Shaft.
* It Increases the probability of resonance

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DEPARTMENT OF ELECTRICAL AND ELECRONICS ENGINEERING

Assignment Answer Sheet

Name of the Student: S. Abinaya

AU Register Number: 912619150002

Assignment – 01			Date of Issue:	10.3.21	Marks	10
Course code	EE8401	Course Title	ELECTRICAL MACHINES II			
Year	II	Semester/Section	IV	Date of Submission:	19.3.21	

Q. No	Questions	CO
1.	What is the relation between electrical degree and mechanical degree?	C210.2
2.	Justify that short-pitch winding is preferred over full pitch winding?	C210.1
3.	Why a 3-phase synchronous motor will always run at synchronous speed?	C210.3
4.	Mention the need for starters in synchronous motors	C210.3
5.	Discuss are the causes of hunting?	C210.3

Mark Allocation

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

A. Rimrose

Name and Signature of the Faculty Incharge

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Tutorial Question Paper

Tutorial – 02			Date of Issue:	01.04.2021	Marks	10
Course code	EE8401	Course Title	ELECTRICAL MACHINES II			
Year	II	Semester/Section	IV	Date of Submission:	7.4.2021	

Q. No	Questions	CO
1	A three-phase slip ring induction motor has rotor resistance of 0.03 ohm and standstill reactance 0.1 ohm. What should be the value of external resistance per phase to be added to the rotor circuit in order to obtain maximum torque at standstill condition?	CO210.3
2	A 3.3 KV, 20 pole, 50 HZ, 3-phase induction motor has a rotor resistance and standstill reactance of 0.014 ohm and 0.113 ohm per phase respectively Calculate (i). The speed at which the torque developed is maximum and (ii). the ratio of full load torque to maximum torque, if the full load torque is delivered at 288 rpm.	CO210.3
3	The power input to a 3-phase induction motor is 55 KW. The total stator losses equal 2.2 KW. Find (i). the rotor copper loss and (ii). the mechanical power developed, if the motor is running at a speed of 720 rpm on a 50 Hz supply.	CO210.3

A. Primrose

Name and Signature of the Faculty Incharge

(A. PRIMROSE)

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TUTORIAL - II

EE8401 - Electrical Machines - II

A. Thilagavathi

N. Arthy
918619105004
II - year
IV - Sem

8.4.2021

9/10

1) A three-phase Slip-ring Induction motor has rotor resistance 0.03Ω and Standstill reactance 0.15Ω per phase. What should be the value of external resistance per phase to be added to the rotor circuit in order to obtain maximum torque at starting condition?

Data: $R_2 = 0.03\Omega$; $X_2 = 0.15\Omega$

Aim: R_E? So that $T_{ds} = T_{dmax}$

Solution:-

To obtain $T_{ds} = T_{dmax}$

$$R_2 = X_2$$

$$\therefore R_2 = X_2 = 0.15\Omega$$

But $R_2 = R_2 + R_e$

$$\therefore R_e = R_2 - R_2 = 0.15 - 0.03$$

$$= 0.12\Omega$$

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2. The power input to a 3-phase Induction motor is 55 KW. The total Stator losses equals 2.2 KW. Find (i) the rotor copper loss and ii) the Mechanical power developed, if the motor is running at a speed of 720 rpm on a 50 Hz supply

Data: $P_i = 55KW$; $(W_{cu1} + W_i) = 2.2KW$; $N_r = 720rpm$; $f_x = 50Hz$

Aim: i) W_{cu2}? ii) P_d?

Solution:

$$P = \frac{120fs}{N_r} = \frac{120 \times 50}{720} = 8.33$$

$$P = 8$$

$$N_s = \frac{120fs}{P} = \frac{120 \times 50}{8}$$

$$N_s = 750rpm$$

$$S = \frac{N_s - N_r}{N_s} = \frac{750 - 720}{750}$$

$$S = 0.04$$

$$P_{ir} = P_i - (W_{cu1} + W_i)$$

$$= 55 - 2.2 = 52.8KW$$

$$W_{cu2} = S \times P_{ir} = 0.04 \times 52.8 = 2.112KW$$

$$\boxed{W_{cu2} = 2.112KW}$$

$$P_d = (1-S)P_{ir} = 0.96 \times 52.8$$

$$\boxed{P_d = 50.688KW}$$

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2. A 3.3kV, 20 pole, 50 Hz, 3-phase Induction motor has rotor resistance and standstill reactance of 0.014 ohm and 0.113 ohm per phase respectively. calculate i) the speed at which the torque developed is maximum and (ii) the ratio of full-load torque to maximum torque, if the full load torque is delivered at 288 rpm.

Data: $V_L = 3.3$ kV; $p = 20$; $f_s = 50$ Hz, $R_2 = 0.014\Omega$; $X_2 = 0.113\Omega$; $N_r = 288$ rpm

Aim: (i) $N_{cr} = ?$ (ii) $\frac{T_d}{T_{dmax}} = ?$

Solution:

$$N_s = \frac{120 f_s}{P} = \frac{120 \times 50}{20} = 300 \text{ rpm}$$

i) condition for maximum torque

$$S_{cr} = \frac{R_2}{X_2}$$

$$= \frac{0.014}{0.113} = 0.1239$$

$$N_{cr} = (1 - S_{cr}) N_s$$

$$N_{cr} = (1 - 0.1239)300 = 262.83 \text{ rpm}$$

ii) Ratio of full-load torque to maximum torque

$$S = \frac{N_s - N_r}{N_s} = \frac{300 - 288}{300} = 0.04$$

$$a = R_2 / X_2 = 0.1239$$

$$\frac{T_d}{T_{dmax}} = \frac{2as}{a^2 + s^2} = \frac{2 \times 0.1239 \times 0.04}{0.1239^2 + 0.04^2}$$

$$\frac{T_d}{T_{dmax}} = 0.5847.$$

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Tutorial Answer Sheet

Name of the Student: N. Arthy
AU Register Number: 912619105004

Tutorial – 02			Date of Issue:	01.04.21	Marks	10
Course code	EE8401	Course Title	ELECTRICAL MACHINES II			
Year	II	Semester/Section	IV	Date of Submission:	8.4.2021	

Q. No	Questions	CO
1	A three-phase slip ring induction motor has rotor resistance of 0.03 ohm and standstill reactance 0.1 ohm. What should be the value of external resistance per phase to be added to the rotor circuit in order to obtain maximum torque at standstill condition?	CO210.3
2	A 3.3 KV, 20 pole, 50 HZ, 3-phase induction motor has a rotor resistance and standstill reactance of 0.014 ohm and 0.113 ohm per phase respectively Calculate (i). The speed at which the torque developed is maximum and (ii). the ratio of full load torque to maximum torque, if the full load torque is delivered at 288 rpm.	CO210.3
3	The power input to a 3-phase induction motor is 55 KW. The total stator losses equal 2.2 KW. Find (i). the rotor copper loss and (ii). the mechanical power developed, if the motor is running at a speed of 720 rpm on a 50 Hz supply.	CO210.3

Mark Allocation

Rubrics	Marks Allocated	Marks obtained
Problem solving approach	6	6
Correctness of Answer	2	2
Timely submission	2	1
Total marks	10	09

A. Rimose.

Name and Signature of the Faculty Incharge

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IQAC Academic Audit Form

ACADEMIC YEAR: 2020-2021 EVEN SEMESTER

Name of Department :	EEE	Year / Sem :	II / IV	No. of Students Registered :	11
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.	EE8401	912619105004	Y	Y	11	NIL	NIL	100%	–
2.	EE8402	912619105007	Y	Y	11	NIL	NIL	100%	–
3.	EE8403	912619105001	Y	Y	11	NIL	NIL	100%	–
4.	EE8451	912619105009	Y	Y	11	NIL	NIL	100%	–
5.	IC8451	912619105003	Y	Y	11	NIL	NIL	100%	–
6.	MA8491	912619105301	Y	Y	11	NIL	NIL	100%	–

Verified by

External Member Name and Signature:	[P. Dennis Hora, AP/CIVIL]
Internal Member Name and Signature:	[J. SATHYARAJ, AP/EEE]

Overall Remarks:

–

HoD/ EEE **IQAC Coordinator** **Principal**

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

STUDENT FEEDBACK ON FACULTY

S.NO.	DESCRIPTION	SCORED OUT OF 4	SCORED OUT OF 100
1.	The Syllabus coverage as prescribed by University.	3.3	83.3
2.	Technical knowledge of the teacher.	3.5	87.5
3.	Teacher's communication skill.	3.7	91.6
4.	Regularity in taking classes.	3.7	91.6
5.	Helping the Students in conducting the experiment through set of instructions and Demonstrations.	3.4	85.4
6.	Tendency of inviting opinion and questions on subject matter from students.	3.9	89.8
7.	Knowledge of the Teacher in latest development of field.	3.5	87.5
8.	Perfectness of Valuation.	3.4	85.4
OVERALL SCORE		3.55	88.8

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REPORT SHEET

S .NO	REG.NO	NAME	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
1.	912619105001	AASHIKA R	3	3	4	4	4	4	3	3
2.	912619105002	ABINAYA S	4	4	4	4	4	4	4	3
3.	912619105003	ABITHA P	4	4	4	3	3	3	4	4
4.	912619105004	ARTHY N	3	3	4	4	3	4	3	3
5.	912619105005	DEEPIKA R	3	4	3	4	3	4	4	4
6.	912619105006	KOGULA PRIYA R	3	3	3	3	3	4	3	3
	912619105007	NISHA S	3	3	3	4	3	3	4	3
8.	912619105008	PAVITHRA M	3	4	3	3	4	3	3	4
9.	912619105009	PRAGADEESHWARI A	3	3	4	4	4	3	3	3
10.	912619105010	SIVARANJANI S	4	4	4	4	4	4	4	4
11.	912619105301	RAGAVI R	4	4	4	3	3	3	4	4
12.	912619105501	BHUVANESHWARI C	3	3	4	4	3	4	3	3
		AVERAGE	3.3	3.5	3.7	3.7	3.4	3.9	3.5	3.4
		PERCENTAGE	83.3	87.5	91.6	91.6	85.4	89.58	87.5	85.4

EXCELLENT	VERY GOOD	GOOD	AVERAGE	POOR
4	3	2	1	0

A. Rimrose.

Signature of the faculty Incharge

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Circular Date: 12-04-2021

The second cycle test will be conducted through online on 19.04.2021, 20.04.2021 & 21.04.2021 for the IV semester (II year) & VI semester (III 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.
- It is the responsibility of the question paper setter to create online Google form Multiple Choice Questions (MCQ) and forward the link to the Exam Coordinators Mr. J. Sathyaraj, A.P/ EEE / Mrs. G. Bhuvaneswari, A.P/CSE on or before 17.04.2021.
- Question Pattern – Part A - 30 single mark MCQ questions and Part B - 15 two mark MCQ questions.
- All staff members are requested to enable the shuffle question order option and limit to one response option in Google form settings.
- The Exam Coordinators (exam cell) are requested to make necessary arrangements for conducting the test.
- Faculty members are requested to take the report on Google forms and give the marks to the students on or before 22.04.2021.

PRINCIPAL

12/04/21

Cc:

- All faculty
- Exam cell
- Office file

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Circular

Date: 12-04-2021

The second cycle test will be conducted through online on 19.04.2021, 20.04.2021 & 21.04.2021 for the IV 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 -11.30 am	01.45 pm – 3.15 pm
19.04.2021	**CE8402** - Strength of Materials-II **(CIVIL)** **CS8451** - Design and Analysis of Algorithms **(CSE)** **EC8451**– Electromagnetic Fields **(ECE)** **EE8402** -Transmission and Distribution **(EEE)**	**CE8401** - Construction Techniques and Practices**(CIVIL)** **CS8491** - Computer Architecture**(CSE)** **EC8491**–Communication Theory **(ECE)** **EE8403**- Measurements and Instrumentation**(EEE)**
20.04.2021	**MA8491** - Numerical Methods**(CIVIL & EEE)** **MA8402**- Probability and Queuing Theory **(CSE)** **MA8451**–Probability and Random Process **(ECE)**	**CE8404** - Concrete Technology**(CIVIL)** **CS8494** - Software Engineering **(CSE)** **EC8452**– Electronic Circuits II **(ECE)** **IC8451**- Control Systems**(EEE)**
21.04.2021	**CE8403** - Applied Hydraulics Engineering**(CIVIL)** **CS8493**- Operating Systems **(CSE)** **EC8453**–Linear Integrated Circuits **(ECE)** **EE8401**- Electrical Machines - II**(EEE)**	**CE8491** - Soil Mechanics**(CIVIL)** **CS8492** - Database Management Systems **(CSE)** **GE8291**–Environmental Science and Engineering **(ECE)** **EE8451**- Linear Integrated Circuits and Applications**(EEE)**

PRINCIPAL

12/04/21

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 - II			Date/Session	21.04.21/FN	Marks	60
Course code	EE8401	Course Title	ELECTRICAL MACHINES II			
Regulation	2017	Duration	90 minutes	Academic Year	2020 - 2021	
Year	II	Semester	IV	Department	EEE	

COURSE OUTCOMES	
C204.1	Ability to construe the construction and working principle of Synchronous generator
C204.2	Ability to interpret MMF curves and armature windings
C204.3	Ability to acquire knowledge on Synchronous motor
C204.4	Ability to infer the construction and working principle of Three phase Induction Motor.
C204.5	Ability to construe the construction and working principle of Special Machines.
C204.6	Ability to predetermine the performance characteristics of Synchronous Machines.

Q.No.	Question	CO	BTS
	PART A **(Answer all the Questions 30 x 01 = 30 Marks)**		
1	A single-phase induction motor is A Self-starting B Not self-starting C Self-starting with the help of an auxiliary winding D None of the above	C204.4	K1
2	A single-phase induction motor is running at N rpm. Its synchronous speed is Ns. If its slip with respect to forward field is s, what is the slip with respect to the backward field? A s B -s C (1 - s) D(2 - s)	C204.5	K2
3	A rotating magnetic field is produced by current is two windings displaced by 90 electrical degrees. This is the principle of A Phase sequences B Phase splitting C Phase timing D None of these	C204.5	K1
4	In a 3-phase, 4-pole, 50 Hz Induction motor, the frequency, pole number and load torque all are halved. The motor speed will be A. 3000 r.p.m. B. 1500 r.p.m. C. 750 r.p.m. D. None of the above	C204.4	K1
5	The no load current of a single-phase induction motor is around ____% of full load current A 10 B 20 C 40 D 80	C204.5	K2
6	The power factor at which single phase induction motors usually operate is A 0.7 lag	C204.4	K2

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	B 0.8 lag C 0.7 lead D Unity		
7	The angle between the rotating stator flux and rotor poles is called _____ angle. A.Torque B.Obtuse C.Synchronizing D.Power factor	C204.4	K1
8	Single phase induction motors are made self-starting by A Increasing rotor resistance B Using an external starting device C Providing an additional winding on the stator called the auxiliary winding D Any of the above methods	C204.4	K3
9	The power factor of a synchronous motor is better than that of induction motor because A.Stator supply is relieved of responsibility of producing magnetic field B.Mechanical load on the motor can be adjusted C.Synchronous motor runs at synchronous speed D.Synchronous motor has large air gap	C204.4	K1
10	The stator winding of a single-phase induction motor is splatted into two parts in order to A Improve efficiency B Improve power factor C Develop starting torque D Increase speed	C204.4	K3
11	In a single-phase induction motor A Both the main and auxiliary windings are placed on stator B Both the main and auxiliary windings are placed on rotor C Main winding is placed on stator and auxiliary winding on rotor D Auxiliary winding is placed on stator and main winding on rotor	C204.5	K1
12	Phase splitting can be accomplished in a single-phase induction motor. A Only by adding capacitor in series with the auxiliary winding B Only by causing the auxiliary winding to have high reactance C Only by causing the auxiliary winding to have low resistance D By any one of the above three methods	C204.5	K1
13	In a split phase motor, the ratio of number of turns of auxiliary winding to that on main winding is A Unity B Less than one C More than one D Two	C204.5	K5
14	Why is a centrifugal switch used in a single-phase induction motor? A To protect the motor from overloading B To improve the starting performance of the motor C To cut off the starting winding at an appropriate instant D To cut in the capacitor during running conditions.	C204.4	K1
15	Centrifugal switch fitted on the rotor will operate when A Rotor speed reaches its rated conditions B Rotor speed exceeds 70 per cent of its rated value C Rotor speed exceeds synchronous speed D Rotor speed exceeds 40 per cent of its rated value	C204.5	K1
16	The torque speed characteristic of two-phase induction motor is largely affected by A Voltage B Speed C X/R ratio D Supply frequency	C204.5	K2

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17	The direction of rotation of a split phase induction motor can be reversed by reversing the connections to the supply of A Auxiliary winding only B Main winding only C Wither (a) and (b) D Both (a) and (b) simultaneously	**C204.5**	K1
18	A variable reluctance stepper motor has 8 main poles which have 5 teeth each. If rotor has 60 teeth, calculate the stepping angle. A 0.9 degree B 3 degree C 0.5 degree D 1.8 degree	**C204.5**	K1
19	A stepper motor has a step angle of 2.50. Determine number of steps required for the shaft to make 25 revolutions. A 3600 B 2500 C 144 D cannot be determined	**C204.5**	K5
20	For a Multi stack variable reluctance stepper motor has 3 stacks, there are 12 stator and rotor poles in each stack. Calculate step angle. A 10 degree B 20 degree C 30 degree D 40 degree	**C204.5**	K3
21	Servomotors are usually rated in _____. A KW B toque/hour C KVA D kg/cm	**C204.5**	K1
22	Which of the following is most accurate motor? A Squirrel cage induction motor B Universal motor C Servomotor D Repulsion motor	**C204.4**	K1
23	The DC servomotors can be controlled by _____. A a d.c. motor B pulse width modulation C pulse position modulation D system of pulses to each phase	**C204.5**	K3
24	Which of the following is used for synchronizing the speed of reluctance type motor? A RPM B CRM C MMF D EMF	**C204.5**	K1
25	The power type factor of a reluctance motor ___ PF? A Leads B Lags C Zero D Equal	**C204.5**	K
26	Which of the following is the efficiency percentage of reluctance type motor? A55 – 75% B 50% C 90% D 99%	**C204.5**	K1
27	Inference the following type of magnetic material is used for rotor in reluctance motor?	**C204.5**	K4

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	A Paramagnetic B Ferro magnetic C Diamagnetic D All the above		
28	Perceive following type of component in reluctance motor has own poles? A Rotor B Stator C Spring D Both a and b	C204.5	K5
29	The purpose of stator winding in the compensated repulsion motor is to A. Provide mechanical balance B. Improve power factor and provide better speed regulation C. Prevent hunting in the motor D. Eliminate armature reaction	C204.5	K4
30	In repulsion motor, zero torque is developed when A. Brush axis is 450 electrical to field axis B. Brush axis coincides with the field axis C. Brush axis is 900 electrical to field axis D. Both (b) and (c)	C204.5	K1
	PART B **(Answer all the Questions 15 x 02 = 30 Marks)**		
31	The capacitor in a capacitor start induction run ac motor is connected in series with A Starting winding B Running winding C Squirrel cage winding D Compensating winding	C204.5	K3
32	A single-phase induction motor is provided with a 3- phase slip ring rotor connected to starting resistances. The motor would A Not start B Result in more starting torque C Produce no difference in the starting torque D Run at half the synchronous speed	C204.4	K1
33	Capacitor in a single-phase induction motor is used for A Improving the power factor B Improving the starting torque C Starting the motor D Reducing the harmonics	C204.4	K3
34	A capacitor selected for capacitor start induction motor should be rated for A Peak voltage B Rms voltage C Average voltage D None of these	C204.5	K2
35	The capacitor employed in a capacitor start induction motor has no A Voltage rating B Polarity marking C Dielectric rating D Definite capacitance value	C204.5	K1
36	A capacitor start single phase induction motor is used for A Easy to start loads B Medium start loads C Hard to start loads D Any type of start loads	C204.5	K4
37	A capacitor start induction motor is switched on to supply with its capacitor replaced by an inductor of equivalent reactance. The motor will	C204.5	K5

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	A Not start at all B Start and run slowly C Start and run at rated speed D Start with humming noise		
38	If the capacitor of a capacitor start induction motor is short circuited the motor will A Start B Not Start C Burn D Start with jerks	**C204.5**	K4
39	If the capacitor of a capacitor start induction motor fails to open when it picks up the speed A The motor will stop B The auxiliary winding will get damaged C The capacitor will get damaged D The main winding will get damaged	**C204.5**	K4
40	Capacitor start capacitor run induction motor is basically a ____motor. A Two phases B Ac series C Commutator D Synchronous	**C204.5**	K3
41	Which of the following applications make use of a universal motor? A Portable tool B Lathe machines C Oil expeller D Floor polishing machine	**C204.5**	K1
42	A variable reluctance stepper motor is constructed of ..... material with salient poles answer choices A Paramagnetic B Ferromagnetic C Diamagnetic D Non-magnetic	**C204.5**	K2
43	A universal motor is one which A is available universally B Can be marketed internationally C Can be operated either on dc or ac supply D Runs at dangerously high speed on no-load	**C204.5**	K1
44	Infer the following motor rotates in discrete angular steps? A Servo motors B DC motor C Stepper motor D Linear Induction Motor (LIM)	**C204.4**	K2
45	Stepper motor runs in response to A Programmed sequence of input electrical pulses. B Pulse Width Modulation (PWM). C feedback signal. D Position Modulation (PPM).	**C204.5**	K4

A. Primrose

Course Faculty

A. PRIMROSE

(Name /Sign / Date)

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B. Priya

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B. PRIYA

(Name /Sign / Date)

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Department of Electrical and Electronics Engineering

ANSWER KEY

Q NO	ANSWER	Q NO	ANSWER	Q NO	ANSWER	Q NO	ANSWER	Q NO	ANSWER
1	C	10	C	19	A	28	A	37	A
2	D	11	A	20	A	29	B	38	B
3	B	12	D	21	D	30	D	39	C
4	B	13	B	22	C	31	A	40	A
5	C	14	C	23	B	32	B	41	A
6	A	15	B	24	A	33	C	42	B
7	C	16	C	25	A	34	A	43	C
8	C	17	C	26	A	35	B	44	C
9	C	18	B	27	B	36	C	45	A

A. Primrose.

Course Faculty
A. PRIMROSE
(Name /Sign / Date)

HoD
B. PRIYA
(Name /Sign / Date)

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC YEAR 2020 – 2021 (EVEN SEMESTER)

STUDENTS MARK STATEMENT- CO BASED

CYCLE TEST-II

SUBJECT CODE &TITLE: EE8401 & Electrical Machines – II

YEAR/SEM: II/IV **MONTH & YEAR:** April & 2021

S.NO	REG NO	STUDENT NAME	C210.4 (15)	C210.5 (45)	TOTAL (60)	TOTAL (100)
1.	912619105001	AASHIKA R	15	44	59	98
2.	912619105002	ABINAYA S	13	42	55	91
3.	912619105003	ABITHA P	14	43	57	95
4.	912619105004	ARTHY N	13	43	56	93
5.	912619105005	DEEPIKA R	14	44	58	96
6.	912619105006	KOGULA PRIYA R	10	38	48	80
7.	912619105007	NISHA S	12	44	56	93
8.	912619105008	PAVITHRA M	15	42	57	95
9.	912619105009	PRAGADEESHWARI A	15	40	55	91
10.	912619105010	SIVARANJANI S	14	42	56	92
11.	912619105301	RAGAVI R	15	43	58	96
12.	912619105501	BHUVANESHWARI C	–	–	–	–

MARKS RANGE:

<20	20-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
–	–	–	–	–	–	01	–	10

Total No. of Candidates Present	11
Total No. of Candidates Absent	NIL
Total No. of Students Pass	11
Total No. of Students Fail	NIL
Percentage of Pass	100 %

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC YEAR 2020 – 2021 (EVEN SEMESTER)

FINAL INTERNAL STUDENTS MARK STATEMENT (Out of 20)

SUBJECT CODE &TITLE: EE8401 ELECTRICAL MACHINES II

YEAR/SEM: II/IV

S.NO	REG NO	STUDENT NAME	TOTAL (20)
1.	912619105001	AASHIKA R	18
2.	912619105002	ABINAYA S	17
3.	912619105003	ABITHA P	16
4.	912619105004	ARTHY N	17
5.	912619105005	DEEPIKA R	17
6.	912619105006	KOGULA PRIYA R	15
7.	912619105007	NISHA S	16
8.	912619105008	PAVITHRA M	18
9.	912619105009	PRAGADEESHWARI A	18
10.	912619105010	SIVARANJANI S	17
11.	912619105301	RAGAVI R	18
12.	912619105501	BHUVANESHWARI C	-

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC YEAR 2020 – 2021 (EVEN SEMESTER)

ANNA UNIVERSITY RESULT STATEMENT APRIL/MAY-2021

SUBJECT CODE &TITLE: EE8401 ELECTRICAL MACHINES II

YEAR/SEM: II/IV

S.NO	REG NO	STUDENT NAME	GRADE
1.	912619105001	AASHIKA R	A+
2.	912619105002	ABINAYA S	A+
3.	912619105003	ABITHA P	A+
4.	912619105004	ARTHY N	A
5.	912619105005	DEEPIKA R	A+
6.	912619105006	KOGULA PRIYA R	UA
7.	912619105007	NISHA S	A+
8.	912619105008	PAVITHRA M	A
9.	912619105009	PRAGADEESHWARI A	A+
10.	912619105010	SIVARANJANI S	A
11.	912619105301	RAGAVI R	A+

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Department of Electrical and Electronics Engineering

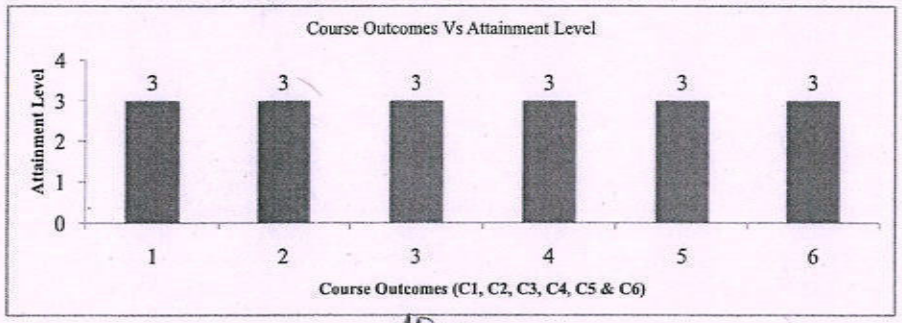
Internal Assessment -Attainment of Course Outcomes (Through Direct Assessment)

ACADEMIC YEAR - 2020 - 2021		BATCH	2019 - 2023						
COURSE CODE/TITLE	EE8401 / ELECTRICAL MACHINES - II	COURSE OUTCOME	1	2	3	4	5	6	
YEAR/SEM	II/IV	TARGET(%)	65	65	65	65	65	65	
COURSE COORDINATOR	Mrs. A PRIMROSE	TOTAL STRENGTH	11						

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	912619105001	AASHIKA R	48	32							39	59							55	36		8	8			8	48	40	47	59	55	44
2	912619105002	ABINAYA S	44	29							36	55							53	36		8	8			8	44	37	44	55	53	44
3	912619105003	ABITHA P	40	27							38	57							51	34		7	8			8	40	34	46	57	51	42
4	912619105004	ARTHY N	50	33							37	56							50	33		8	7			7	50	41	44	56	50	40
5	912619105005	DEEPIKA R	45	30							38	58							52	35		8	9			8	45	38	47	58	52	43
6	912619105006	KOGULA PRIYA R	42	28							32	48							49	32		8	8			9	42	36	40	48	49	41
7	912619105007	NISHA S	41	27							37	56							51	34		7	7			9	41	34	44	56	51	43
8	912619105008	PAVITHRA M	53	35							38	57							52	35		7	8			7	53	42	46	57	52	42
9	912619105009	PRAGADEESHWARI A	53	35							36	55							50	34		8	9			7	53	43	45	55	50	41
10	912619105010	SIVARANJANI S	45	30							37	55							50	33		9	7			8	45	39	44	55	50	41
11	912619105301	RAGAVI R	52	35							38	58							49	33		9	7			9	52	44	45	58	49	42

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	11	11	11	11	11	11
Percentage of Students scored above Target	100.0	100.0	100.0	100.0	100.0	100.0
CO Attainment	3	3	3	3	3	3
CO attainment Values to plot the Graph	3	3	3	3	3	3



Faculty Incharge

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DEPARTMENT OF EEE
COURSE OUTCOME ATTAINMENT - UNIVERSITY EXAMINATION
ACADEMIC YEAR : 2020 - 2021 (EVEN SEM)

YEAR/SEM : II/IV Batch: 2019-2023

SUBJECT : EE8401 - ELECTRICAL MACHINES - II

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

TOTAL STRENGTH : 11

S.NO	Register No	NAME	Univ. Grade
1	912619105001	AASHIKA R	A+
2	912619105002	ABINAYA S	A+
3	912619105003	ABITHA P	A+
4	912619105004	ARTHY N	A
5	912619105005	DEEPIKA R	A+
6	912619105006	KOGULA PRIYA R	UA
7	912619105007	NISHA S	A+
8	912619105008	PAVITHRA M	A
9	912619105009	PRAGADEESHWARI A	A+
10	912619105010	SIVARANJANI S	A
11	912619105301	RAGAVI R	A+

No. of O Grade	0	0
No. of A+ Grade	7	7
No. of A Grade	3	3
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	11
No of students above the target	10	
CO-Attainment University (%)	90.91	

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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
C210.1	100.0	90.91	92.7	3
C210.2	100.0	90.91	92.7	3
C210.3	100.0	90.91	92.7	3
C210.4	100.0	90.91	92.7	3
C210.5	100.0	90.91	92.7	3
C210.6	100.0	90.91	92.7	3

Expected CO-PO Level

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C210.1	3	3	2	2	-	-	-	-	-	2	-	1	3	2	-
C210.2	3	3	2	2	-	-	-	-	-	2	-	1	3	1	-
C210.3	3	3	2	2	-	-	-	-	-	2	-	1	3	1	-
C210.4	3	3	2	2	-	-	-	-	-	2	-	1	3	3	-
C210.5	3	3	2	2	-	-	-	-	-	2	-	1	3	3	-
C210.6	3	3	2	2	-	-	-	-	-	2	-	1	3	3	-
C210	3	3	2	2	-	-	-	-	-	2	-	1	3	2	-

PO Attainment Level

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C210.1	3	3	2	2	-	-	-	-	-	2	-	1	3	2	-
C210.2	3	3	2	2	-	-	-	-	-	2	-	1	3	1	-
C210.3	3	3	2	2	-	-	-	-	-	2	-	1	3	1	-
C210.4	3	3	2	2	-	-	-	-	-	2	-	1	3	3	-
C210.5	3	3	2	2	-	-	-	-	-	2	-	1	3	3	-
C210.6	3	3	2	2	-	-	-	-	-	2	-	1	3	3	-
C210	3	3	2	2	-	-	-	-	-	2	-	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
C210	3	3	2	2	-	-	-	-	-	2	-	1	3	2	-
Attainment	3	3	2	2	-	-	-	-	-	2	-	1	3	2	-

Comments by Program Coordinator	1. 2.
Remarks by HoD	

A Primrose
Name and Signature of the Faculty Member
(A. Primrose)

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