Indra Ganesan

COLLEGE OF ENGINEERING

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Accredited by NAAC with 'B+' Grade, 2(f) & 12B Status Institution by UGC

IG Valley, Madurai Main Road, Manikandam, Tiruchirappalli - 620012

NAAC DOCUMENTS

QUALITY INDICATOR FRAME WORK

CRITERION – 1

CURRICULAR ASPECTS

SUBMITTED BY

IQAC
INTERNAL QUALITY ASSURANCE CELL
INDRA GANESAN COLLEGE OF ENGINEERING

Criteria 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 Content

INDRA GANESAN COLLEGE OF ENGINEERING

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

PREFACE OF THE COURSE FILE

Batch : **2021-2025**

Academic Year : **2022-2023 / EVEN**

Program : **ELECTRICAL AND ELECTRONICS ENGINEERING**

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

Course Code : **EE 3402** NBA Course Code:

Name of the Course : **Transmission & Distribution**

Faculty in-charge : **Mr.D.Praveen Sangeeth Kumar**, AP / **EEE**

DPraveen

Signature of the Faculty in-charge

G.Malathi

HoD / **EEE**

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
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Manikandam, Trichy-620 012.

INDRA GANESAN COLLEGE OF ENGINEERING

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SYLLABUS

EE3401 **TRANSMISSION AND DISTRIBUTION** **L T P C 3 0 0 3**

COURSE OBJECTIVES:

To impart knowledge about the configuration of the electrical power systems. To study the line parameters and interference with neighboring circuits.
To understand the mechanical design and performance analysis of transmission lines. To learn about different insulators and underground cables.
To understand and analyze the distribution system.

UNIT I

TRANSMISSION LINE PARAMETERS **9**

Structure of electric power system - Parameters of single and three phase transmission lines with single and double circuits -Resistance, inductance, and capacitance of solid, stranded, and bundled conductors - Typical configuration, conductor types - Symmetrical and unsymmetrical spacing and transposition – application of self and mutual GMD; skin and proximity effects - Effects of earth on the capacitance of the transmission line - interference with neighboring communication circuits.

UNIT II

MODELLING AND PERFORMANCE OF TRANSMISSION LINES **9**

Performance of Transmission lines – short line, medium line and long line – equivalent circuits, phasor diagram, attenuation constant, phase constant, surge impedance – transmission efficiency and voltage regulation, real and reactive power flow in lines – Power Circle diagrams – Ferranti effect – Formation of Corona – Critical Voltages – Effect on line Performance.

UNIT III

SAG CALCULATION AND LINE SUPPORTS **9**

Mechanical design of overhead lines – Line Supports –Types of towers – Tension and Sag Calculation for different weather conditions – Methods of grounding - Insulators: Types, voltage distribution in insulator string, improvement of string efficiency, testing of insulators.

UNIT IV

NDERGROUND CABLES **9**

Underground cables – Types of cables – Construction of single-core and 3-core belted cables – Insulation Resistance – Potential Gradient – Capacitance of single-core and 3-core belted cables – Grading of cables – Power factor and heating of cables– DC cables.

UNIT V

DISTRIBUTION SYSTEMS **9**

Distribution Systems – General Aspects – Kelvin's Law – AC and DC distributions –Concentrated and Distributed loading- Techniques of Voltage Control and Power factor improvement – Distribution Loss – Types of Substations – Trends in Transmission and Distribution: EHVAC, HVDC and FACTS (Qualitative treatment only).

TOTAL: 45 PERIODS

TEXT BOOKS:

Dr. G. Balakrishnan, M.E., Ph.D.,
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1. D.P.Kothari, I.J. Nagarath, 'Power System Engineering', Mc Graw-Hill Publishing Company limited, New Delhi, Third Edition, 2019.
2. C.L.Wadhwa, 'Electrical Power Systems', New Age International Ltd, seventh edition 2022.
3. S.N. Singh, 'Electric Power Generation, Transmission and Distribution', Prentice Hall of India Pvt. Ltd, New Delhi, Second Edition, 2008.

REFERENCE BOOKS:

1. B.R.Gupta, 'Power System Analysis and Design' S. Chand, New Delhi, Sixth Edition, 2011.
2. Luces M.Fualken berry, Walter Coffer, 'Electrical Power Distribution and Transmission', Pearson Education, 2007.
3. Arun Ingole, "Power transmission and distribution" Pearson Education, first edition, 2018
4. J.Brian Hardy and Colin R.Bayliss 'Transmission and Distribution in Electrical Engineering', Newnes; Fourth Edition, 2011.
5. G.Ramamurthy, "Handbook of Electrical power Distribution," Universities Press, 2013.
6. V.K.Mehta, Rohit Mehta, 'Principles of power system', S. Chand & Company Ltd, New Delhi, 2013
7. Hadi Saadat, 'Power System Analysis', McGraw Hill Education Pvt. Ltd., New Delhi, 3rd Edition, 23rd reprint, 2015.
8. R.K.Rajput, 'A Text Book of Power System Engineering' 2nd edition, Laxmi Publications (P) Ltd, New Delhi, 2016.

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

Lecture Schedule

Degree/Program: **B.E / EEE**
Duration: **2022 - 2023**

Course code &Name: **EE3401** –Transmission & Distribution
Semester: **IV**
Faculty: **D.Praveen Sangeeth kumar**

AIM:

To impart knowledge about the configuration of the electrical power systems.

OBJECTIVES:

To impart knowledge on

(i) To impart knowledge about the configuration of the electrical power systems.
(ii) To study the line parameters and interference with neighboring circuits.
(iii) To understand the mechanical design and performance analysis of transmission lines
(iv) To learn about different insulators and underground cables
(v) To understand and analyze the distribution system.

PREREQUISITES: Circuit theory, Electromagnetic theory.

COURSE OUTCOMES:

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C212.1	Understand the structure of power system, computation of transmission line parameters for different configurations.	1,2,3,4	1,2
C212.2	Model the transmission lines to determine the line performance and to understand the impact of Ferranti effect and corona on line performance.	1,2,3,4	1,2
C212.3	Do Mechanical design of transmission lines, grounding and to understand about the insulators in transmission system	1,2,3,4	1,2
C212.4	Design the underground cables and understand the performance analysis of underground cable	1,2,3,4	1,2
C212.5	Understand the modelling, performance analysis and modern trends in distribution system.	1,2,3,4	1,2
C212.6	Explain the working principle, speed control methods of DC motor and estimate the performance of DC motors through various testing methodologies.	1,2,3,4	1,2

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S.No	Date	Period	Topics to be Covered	Book & Page. No.
UNIT -I - TRANSMISSION LINE PARAMETERS				**Target periods :9**
1	6.2.23	1	Structure of electric power system	T1,R1
2	7.2.23	3	Parameters of single and three phase transmission lines with singleand double circuits	T1,R1
3	10.2.23	1,2	Resistance, inductance, and capacitance of solid	T1,R1
4	11.2.23	1	stranded, and bundled conductors - Typical configuration, conductor types	
5	13.2.23	1	Symmetrical and unsymmetrical spacing and transposition	T1,R1
6	14.2.23	3	Application of self and mutual GMD	T1,R1
7	17.2.23	1,2	GMD Problems	T1,R1
8	18.2.23	3	skin and proximity effects	T1,R1
9	20.2.23	1	Effects of earth on the capacitance of the transmission	T1,R1
10	21.2.23	3	REVISION	T1,R1
UNIT II - MODELLING AND PERFORMANCE OF TRANSMISSION LINES				**Target periods :9**
11	24.2.23	1,2	Performance of Transmission lines	T1,R1
12	27.2.23	1	short line, medium line and long line of Transmission lines	T1,R1
13	28.2.23	3	Equivalent circuits- short line, medium line and long line of Transmission lines	T1,R1
14	3.3.23	1,2	Phasor diagram	T1,R1
15	13.3.23	1	Attenuation constant, phase constant	T1,R1
16	14.3.23	3	Surge impedance	T1,R1
17	17.3.23	1,2	Transmission efficiency and voltage regulation	T1,R1
18	18.3.23	1	Real and reactive power flow in lines	T1,R1
19	20.3.23	1	Power Circle diagrams	T1,R1
20	21.3.23	3	REVISION	T1,R1
21	24.3.23	1	REVISION / PROBLEM	T1,R1
UNIT III - SAG CALCULATION AND LINE SUPPORTS				**Target Periods :9**
22	24.3.23	2	Mechanical design of overhead lines	T1,R1
23	25.3.23	3	Line Supports	T1,R1
24	27.3.23	1	Types of towers	
25	28.3.23	3	Tension and Sag Calculation for different weather conditions –	T1,R1
26	31.3.23	1	Methods of grounding.	T1,R1
27	31.3.23	2	Insulators: Types,	T1,R1
28	10.4.23	1	voltage distribution in insulator string	T1,R1
29	11.4.23	3	improvement of string efficiency	T1,R1
30	14.4.23	1	Testing of insulators.	T1,R1
31	14.4.23	2	Problems	T1,R1
32	17.4.23	1	REVISION	T1,R1
UNIT IV - UNDERGROUND CABLES Target Periods :9				
33	18.4.23	3	Underground cables	T1,R1
34	21.4.23	1	Types of cables	
35	21.4.23	2	– Construction of single-	T1,R1
36	24.4.23	1	3-core belted cables	T1,R1
37	25.4.23	3	Insulation Resistance	T1,R1
38	28.4.23	1	– Potential Gradient	
39	28.4.23	2	– Capacitance of single-core and 3-core belted cables –	T1,R1

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40	1.5.23	1	Grading of cables	T1,R1
41	12.5.23	1	– Power factor and heating of cables	
42	12.5.23	2	REVISION	T1,R1
UNIT V - DISTRIBUTION SYSTEMS Target Periods:9				
43	13.5.23	1	Distribution Systems	T1,R1
44	13.5.23	2	General Aspects – Kelvin's Law	T1,R1
45	15.5.23	1	AC and DC distributions	T1,R1
46	16.5.23	3	Concentrated and Distributed loading	T1,R1
47	19.5.23	1	Techniques of Voltage Control and Power factor improvement	T1,R1
48	19.5.23	2	Distribution Loss	T1,R1
49	20.5.23	1	Types of Substations	T1,R1
50	22.5.23	1	Trends in Transmission and Distribution	T1,R1
51	23.5.23	3	REVISION	T1,R1
Content Beyond the Syllabus				
52			GRID CONNECTED PV SYSTEM USING NET METER	Material

Book Reference - Text Books

Sl.	Title of the Book	Author	Publisher	Year
1.	Power System Engineering'	Nagrath, I.J. and Kothari, D.P	Tata McGraw Hill, Fourth Edition	2019.
2.	Electrical Power Systems'	C.L.Wadhwa.	New Age International Ltd.,	2022.
3	Electric Power Generation	S.N. Singh	Prentice Hall of India Pvt. Ltd, New Delhi	2008

Book Reference – References

Sl	Title of the Book	Author	Publisher	Year
1.	Power System Analysis and Design'	B.R.Gupta.,	S. Chand, New Delhi	2011.
2.	Electrical Power Distribution and Transmission	Luces M.Fualken berry, Walter Coffer	Pearson Education	2007

Website Refere ce:
http://nptel.iitm.ac.in/courses.php?branch=Electrical
www.freebookspot.com

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

Identification of Curricular Gap & Content Beyond Syllabus(CBS)

Name of the Faculty :D.PRAVEEN SANGEETH KUMAR **Course Code & Name:EE3401 TD**

Degree & Program:B.E. /EEE **Semester & Section: IV** **Academic Year: 2022 -2023 /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
C212.1	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C212.2	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C212.3	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C212.4	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C212.5	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C212.6	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C212	3	2	1	1	-	-	-	-	-	2	1	1	2	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
GRID CONNECTED PHOTOVOLTAIC POWER SYSTEM	PO5(2) Vacant filled	C212.5 & C212.6/ IV & V

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
C212.1	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C212.2	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C212.3	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C212.4	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C212.5	3	2	1	1	*2	-	-	-	-	2	1	1	2	2
C212.6	3	2	1	1	*2	-	-	-	-	2	1	1	2	2
C212	3	2	1	1	*2	-	-	-	-	2	1	1	2	2

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

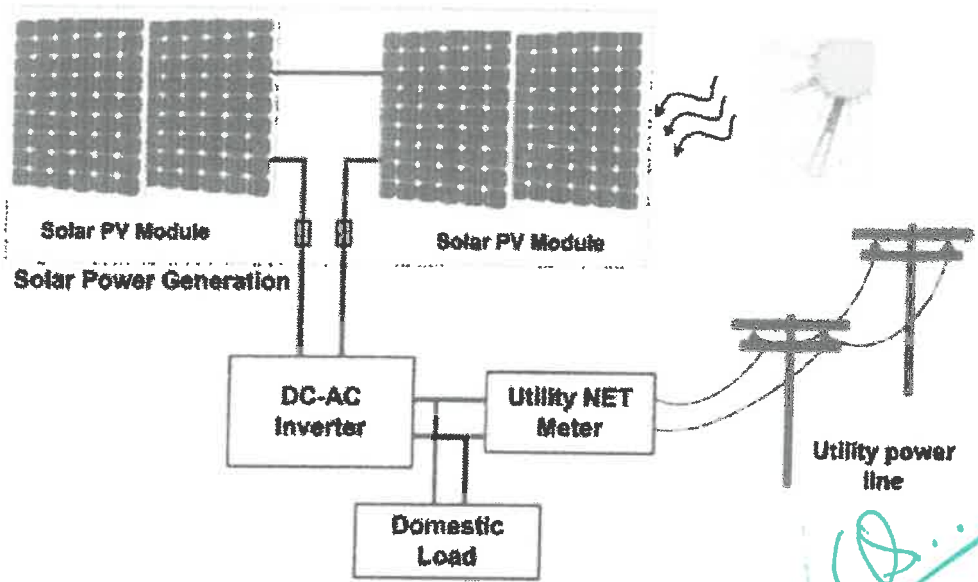
Identification of Curricular Gap & Content Beyond Syllabus(CBS) MATERIAL

Name of the Faculty : D.PRAVEEN SANGEETH KUMAR
Course Code & Name: EE3302 & TRANSMISSION AND DISTRIBUTION
Degree & Program: B.E. /EEE Semester & Section: IV / A Academic Year: 2022 -2023/EVEN

TOPIC: Grid Connected Photovoltaic Power system

INTRODUCTION

In a grid connected PV system, also known as a "grid-tied", or "on-grid" solar system, the PV solar panels or array are electrically connected or "tied" to the local mains electricity grid which feeds electrical energy back into the grid.



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A *grid connected PV system* is one where the photovoltaic panels or array are connected to the utility grid through a power inverter unit allowing them to operate in parallel with the electric utility grid.

In the previous tutorial we looked at how a stand alone PV system uses photovoltaic panels and deep cycle batteries to store its solar energy providing a complete self-contained solar power system. However, this type of solar system works fine providing there is enough solar radiation during the day to recharge the batteries for use during the night.

Stand alone solar systems are self contained fixed or portable solar PV systems that are not connected to any local utility or mains electrical grid as they are generally used in remote and rural areas. This generally means that the electrical appliances are a long way from the nearest fixed electrical supply, or were the cost of extending a power line from the local grid may be very expensive

In recent years, however, the number of solar powered homes connected to the local electricity grid has increased dramatically. These **Grid Connected PV Systems** have solar panels that provide some or even most of their power needs during the day time, while still being connected to the local electrical grid network during the night time.

Solar powered PV systems can sometimes produce more electricity than is actually needed or consumed, especially during the long hot summer months. This extra or surplus electricity is either stored in batteries or as in most grid connected PV systems, fed directly back into the electrical grid network.

In other words, homes and buildings that use a grid connected PV system can use a portion or all of their energy needs with solar energy, and still use power from the normal electrical mains grid during the night or on cloudy dull and rainy days, giving the best of both worlds. Then in *grid connected PV systems*, electricity flows back-and-forth to and from the mains grid according to sunlight conditions and the actual electrical demand at that time.

In a grid connected PV system, also known as a "grid-tied", or "on-grid" solar system, the PV solar panels or array are electrically connected or "tied" to the local mains electricity grid which feeds electrical energy back into the grid.

The main advantage of a grid connected PV system is its simplicity, relatively low operating and maintenance costs as well as reduced electricity bills. The disadvantage however is that a sufficient number of solar panels need to be installed to generate the required amount of excess power.

Since grid tied systems feed their solar energy directly back into the grid, expensive back-up batteries are not necessary and can be omitted from most grid connected designs. Also, as this type of PV system is permanently connected to the grid, solar energy consumption and solar panel sizing calculations are not required, giving a large range of options allowing for a system as small as 1.0kWh on the roof to help reduce your electricity bills, or a much larger floor mounted array that is large enough to virtually eliminate your electricity bills completely.

Signature of the Faculty

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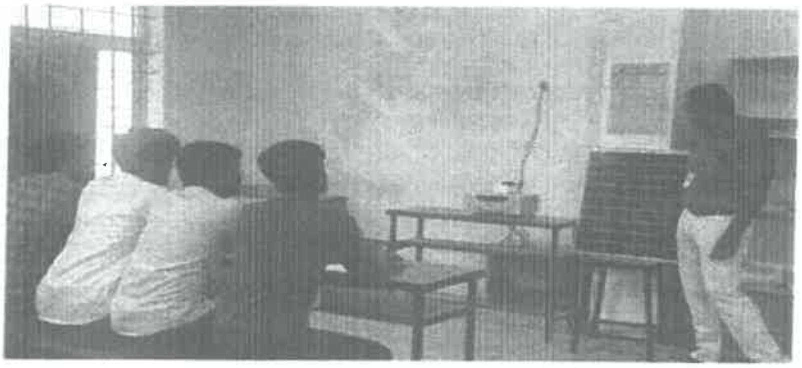
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Identification of Curricular Gap & Content Beyond Syllabus (CBS)

Proof

Name of the Faculty : D.PRAVEEN SANGEETH KUMAR
Course Code & Name: EE3302 & TRANSMISSION AND DISTRIBUTION
Degree & Program: B.E. /EEE Semester & Section: IV Academic Year: 2022 -2023/EVEN

TOPIC: Grid Connected Photovoltaic Power system



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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

Assignment Question Paper

Name of the Student: Hariharan E

AU Register Number: 811221105012

Assignment – 01			**Date of Issue:**	13.02.2023		**Marks**	10
Course code	EE3402	**Course Title**	TRANSMISSION & DISTRIBUTION				
Year	II	**Semester/Section**	IV	**Date of Submission:**	27.02.2023		

Q.No	Questions	CO
1	Derive expression for the inductance of three phase line with conductors untransposed LINE	C212.1
2	Corona Formation ; Nominal PI Method	C212.1

D Praveen

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

Assignment Answer Sheet

Name of the Student: Hariharan E

AU Register Number: 811221105012

Assignment – 01			Date of Issue:	13.02.2023	Marks	10
Course code	EE3402	Course Title	TRANSMISSION & DISTRIBUTION			
Year	II	Semester/Section	IV	Date of Submission:	27.02.2023	

Q.No	Questions	CO
1	Derive expression for the inductance of three phase line with conductors untransposed LINE	C212.1
2	Corona Formation ; Nominal PI Method	C212.1

Mark Allocation

Rubrics	Marks Allocated	Marks obtained
Content Quality	6	5
Presentation Quality	2	1
Timely submission	2	1
Total marks	10	07

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

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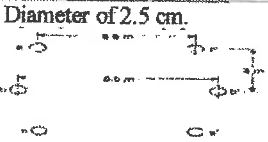
Internal Assessment Exam - I				Date/Session	08/03/23 AN	Marks	50
Course code	EE3402	Course Title		TRANSMISSION & DISTRIBUTION			
Regulation	2022	Duration		90 minutes	Academic Year	2022-23	
Year	2ND	Semester		IV	Department	EEE	

COURSE OUTCOMES

CO1:	To Explain the structure of power system, computation of transmission line parameters for different configurations.
CO2:	Model the transmission lines to determine the line performance and to understand the impact of Ferranti effect and corona on line performance.
CO3:	Do Mechanical design of transmission lines, grounding and to understand about the insulators in transmission system
CO4:	Design the underground cables and understand the performance analysis of underground cable
CO5:	To Explain the modeling, performance analysis and modern trends in distribution system.
CO6:	Explain the working principle, speed control methods of DC motor and estimate the performance of DC motors through various testing methodologies.

Q.No.	Question	CO	BTS
	PART A **(Answer all the Questions 10 x 2 = 20 Marks)**		
1	Explain skin effect?	CO1	K2
2	Define medium lines.	CO1	K1
3	Why ACSR conductors are used in lines?	CO1	K2
4	Mention the limitations of end condenser method.	CO1	K1
5	Mention the significance of Surge impedance loading	CO3	K1
6	Define a neutral plane	CO1	K5
7	Classify different types of conductors	CO2	K4
8	Define critical disruptive voltage	CO1	K1
9	Define visual critical voltage	CO1	K1
10	State any two merits of corona	CO1	K1
	PART B **(Answer all the Questions 2 x 10 = 20 Marks)**		
11a	Derive expression for the inductance of three phase line with conductor's untransposed line.	CO1	K2
	OR		
11b	Derive an expression for capacitances of a single phase transmission system and discuss the effect of earth on capacitance with suitable equation.	CO1	K2
12a	Determine the efficiency and regulation of a 3phase, 100Km, 50 Hz transmission line delivering 20 MW at a power factor of 0.8 lagging and 66 kV to a balanced load. The conductors are of copper, each having resistance 0.1 / Km, 1.5 cm outside dia, spaced equilaterally 2 meters between centers. Use nominal T method	CO4	K3
	OR		
12b	A Single phase O.H line delivers 1100 KW at 33 KV at 0.8 PF lagging. Total Resistance and Inductive reactance of the line 10 ohm & 15 ohm. Find Sending End voltage, Sending End Power factor & Efficiency	CO4	K3
	PART C **(Answer all the Questions 1 x 10 = 10 Marks)**		
13a	Explain briefly about Corona and Methods of Reducing Corona.	CO3	K2
	OR		
13b	Determine the Inductance of line having Diameter of 2.5 cm. 	CO3	K3

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HoD

Q.No.	Question	CO	BTS
	PART A **(Answer all the Questions 10 x 2 = 20 Marks)**		
1	Explain skin effect? skin effect, in electricity, the tendency of alternating high-frequency currents to crowd toward the surface of a conducting material	CO1	K2
2	Define medium lines. A medium transmission line is a type of overhead transmission line that is used to transmit electrical power over a distance of more than 80 km but less than 250 km.	CO1	K1
3	Why ACSR conductors are used in lines? Aluminum conductor steel-reinforced cable (ACSR) is a type of high-capacity, high-strength stranded conductor typically used in overhead power lines.	CO1	K2
4	Mention the limitations of end condenser method. There is a considerable error (about 10%) in calculations because the distributed capacitance has been assumed to be lumped or concentrated	CO1	K1
5	Mention the significance of Surge impedance loading SIL is also an indicator of whether the transmission line has been loaded above or below its stability limit.	CO3	K1
6	Define A Neutral Plane The Plane Within The Machine Where The Velocity Of The Rotor Wires Is Exactly Parllel To Magnetic Flux Lines	CO1	K5
7	Classify different types of conductors Depending on the conductivity, materials are classified as conductors, insulators and superconductors	CO2	K4
8	Define critical disruptive voltage Critical Disruptive Voltage is defined as the minimum phase to the neutral voltage required for the corona discharge (corona losses) to start.	CO1	K1
9	Define visual critical voltage This can be defined as the minimum voltage at which corona glow appears and you can see it visually	CO1	K1
10	State any two merits of corona (i) Due to corona formation, the air surrounding the conductor becomes conducting and hence the virtual diameter of the conductor is increased. The increased diameter reduces the electrostatic stresses between the conductors. (ii) Corona reduces the effects of transients produced by surges.	CO1	K1
	PART B **(Answer all the Questions 2 x 10 = 20 Marks)**		
11a	Derive expression for the inductance of three phase line with conductor's untransposed line. • The inductance of the three-phase line is equal to the two-wire line. Thus, it is found that the values of the inductance for the three phases are equalized by transpositions. is called the capacitance to neutral or capacitance to ground. ➢With the effect of earth capacitance increases. • Diagram (6 Marks)	CO1	K2
	OR		
11b	Derive an expression for capacitances of a single phase transmission system and discuss the effect of earth on capacitance with suitable equation. • Earth affects the calculation of capacitance of three-phase lines as its presence alters the electric field lines. Usually the height of the conductors placed on transmission towers is much larger than the spacing between the conductors. • Diagram (6 Marks)	CO1	K2
12a	Determine the efficiency and regulation of a 3phase, 100Km, 50 Hz transmission line delivering 20 MW at a power factor of 0.8 lagging and 66 kV to a balanced load. The conductors are of copper, each having resistance 0.1 / Km, 1.5 cm outside dia, spaced equilaterally 2 meters between centers. Use nominal T Method • P.F 0.9 • % Reg 15.27 • Sending end power 21.18 MW • Efficiency 94 %	CO4	K3
	OR		
12b	A Single phase O.H line delivers 1100 KW at 33 KV at 0.8 PF lagging. Total Resistance and Inductive reactance of the line 10 ohm & 15 ohm. Find Sending End voltage, Sending End Power factor & Efficiency • P.F 0.8 • % Reg 13.27 • Sending end power 24.18 MW • Efficiency 92 %	CO4	K3
	PART C **(Answer all the Questions 1 x 10 = 10 Marks)**		
13a	Explain briefly about Corona and Methods of Reducing Corona. By Increasing Conductor Size: The voltage at which corona occurs can be raised by increasing conductor size. ... 5 Marks By Increasing Conductor Spacing: The corona effect can be eliminated by increasing the spacing between conductors, which raises the voltage at which corona occurs. 5 Marks	CO3	K2

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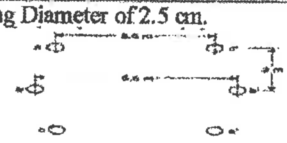
	OR		
13b	Determine the Inductance of line having Diameter of 2.5 cm.  $r=2\times10^{-3}$m $r'=0.7788\times2\times10^{-3}=0.001557$ $r'=0.7788\times2\times10^{-3}=0.001557$m $l=2\times10^{-7}\ln$[illegible] Ind $=18.92\times10^{-7}$H/m	CO3	K3

Course Faculty

HoD

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INDRA GANESAN COLLEGE OF ENGINEERING

IG VALLEY, MANIDANDAM, TIRUCHIRAPPALLI – 620 012

EPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC YEAR 2022 – 2023 (EVEN SEMESTER)

STUDENTS MARK STATEMENT- CO BASED

INTERNAL TEST-I

SUBJECT CODE &TITLE: EE3401 TRANSMISSION & DISTRIBUTION

YEAR/SEM: II/IV

MONTH & YEAR:

S.NO	REG NO	STUDENT NAME	CO1 (26)	CO2 (2)	CO3 (12)	CO4 (10)	TOTAL (50)
1.	811221105012	Hariharan E	12	01	10	07	30
2.	811221105018	Lingeswaran R	09	01	07	02	19
3.	811221105027	Sangili S	09	00	07	02	18
4.	811221105039	Srikanth M	13	01	10	07	31

MARKS RANGE:

<20	20-30	31-40	41-50
1	3	-	-

Total No.of Candidates Present	04
Total No.of Candidates Absent	00
Total No.of Students Pass	02
Total No. of Students Fail	02
Percentage of Pass	50

STAFF INCHARGE

HoD/EEE

PRINCIPAL

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INDRA GANESAN COLLEGE OF ENGINEERING
IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ROOT CAUSE ANALYSIS

Name of the Faculty: D.PRAVEEN SANGEETH KUMAR
Degree & Program: BE & EEE
IA Test : I /II/III/Model
Target : 90 %

Course Code & Name : EE3401 & TRANSMISSION AND DISTRIBUTION
Semester & Section : IV/A
University Exam/Month & Year:
Achieved : 50 %

S.NO	BATCH NO REG	NAME OF THE STUDENT	CAUSES FOR FAILURE	SIGNATURE OF THE STUDENT WITH DATE	CORRECTIVE ACTION TAKEN	PREVENTIVE ACTION TAKEN
1	1	SANGILI S	Lagging of problem solving	S.Sangili	Instructed to Solve more number of problems	Assignment given

Signature of the Faculty Member

G.Malathi
Signature of the HoD/EEE

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IQAC Academic Audit Form

ACADEMIC YEAR: 2022-2023 EVEN SEMESTER

Name of Department : EEE Year / Sem / Sec : 2 / IV No. of Students Registered : 4

Details of Examination : IA Test -MODEL

S.No.	Course Code	List of Reg.No Verified	Course Log Book Verified (Y / N)	Course File Verified (Y / N)	No of students Attended	No of Absentees	No of Failures	Pass %	Remarks
1.	EE 3401	811221105031	Y	Y	4	-	1	75%	

Verified by

External Member Name and Signature:	Dr. KARTHICK
Internal Member Name and Signature:	Mr. S. Ponmathi Rajithkumar

Overall Remarks:

G. Malathi

HoD/ EEE

IQAC Co-ordinator

Principal

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