Department of Electrical & Electronics Engineering

Course File

BASIC ELECTRICAL ENGINEERING
(Course Code: EE204ES)

I B.Tech II Semester

2023-24

Yasoda Krishna Syameleti
Assistant Professor

Anurag
ENGINEERING COLLEGE
(An Autonomous Institution)

Ananthagiri, Kodad, Telangana 508 206, India.

Department of Electrical & Electronics Engineering

BASIC ELECTRICAL ENGINEERING

Check List

Department of Electrical & Electronics Engineering

Int. Marks:40   Ext. Marks:60   Total Marks:100

(EE204ES) BASICELECTRICALENGINEERING

I Year B.Tech. IT-II Sem   **L-T-P-C**

2-0-0-2

Unit-I:

D.C. Circuits: Electrical circuit elements (R, L and C), voltage and current sources, Ohm's Law, KVL & KCL, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. Time-domain analysis of first-order RL and RC circuits.

Unit-II:

A.C. Circuits: Representation of sinusoidal waveforms, peak and rms values, phasor representation, realpower, reactive power, apparent power, powerfactor, Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series only), resonance in series R-L- C circuit. Three-phase balanced circuits, voltage and current relations in star and deltaconnections.

Unit-III:

Transformers: Ideal and practical transformer, equivalent circuit, losses in transformers, OC&SC teston transformers, regulation and efficiency. Condition for maximumefficiencyand applications.

Unit-IV:

Electrical Machines: Construction and working principle of dc machine, performance characteristics of dc shunt machine. Generation of rotating magnetic field, Construction and working of a three-phase induction motor, Significance of torque-slip characteristics. Single-phase induction motor, Construction and working. Construction and working of synchronous generator.

Unit-V:

Electrical Installations: Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics forBatteries. Elementary calculations for energy consumption, power factor improvement and battery backup.

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TextBooks:

1.   D.P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 4th Edition, 2019.

2.   MS Naidu and S Kamakshaiah, "Basic Electrical Engineering", Tata McGrawHill, 2nd Edition, 2008.

ReferenceBooks:

1.   P. Ramana, M. Suryakalavathi, G.T. Chandrasheker, "Basic Electrical Engineering", S. Chand, 2nd Edition, 2019.

2.   D.C.Kulshreshtha,"BasicElectricalEngineering",McGrawHill,2009

3.   M. S. Sukhija, T. K. Nagsarkar, "Basic Electrical and Electronics Engineering", Oxford, 1stEdition, 2012.

4.   Abhijit Chakrabarthi, Sudipta Debnath, Chandan Kumar Chanda, "Basic Electrical Engineering", 2nd Edition, McGraw Hill, 2021.

5.   L.S.Bobrow,"FundamentalsofElectricalEngineering",OxfordUniversityPress,2011.

6.   E.Hughes,"ElectricalandElectronicsTechnology",Pearson,2010.

7.   V.D.Toro,"ElectricalEngineeringFundamentals",PrenticeHallIndia,1989

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Timetable

I B.Tech. II Semester-BEE (IT&ECE)

Day/Hour	9.30-10.20	10.20-11.10	11.20-12.10	12.50-01.35	01.35-02.20	02.30-03.15	03.15-04.00
Monday					ECE	IT	
Tuesday			IT			ECE	
Wednesday				ECE	IT		
Thursday	ECE			IT			
Friday		ECE		IT			
Saturday							

Department of Electrical & Electronics Engineering

Vision of the Institute

To be a premier Institute in the country and region for the study of Engineering, Technology and Management by maintaining high academic standards which promotes the analytical thinking and independent judgment among the prime stakeholders, enabling them to function responsibly in the globalized society.

Mission of the Institute

To be a world-class Institute, achieving excellence in teaching, research and consultancy in cutting-edge Technologies and be in the service of society in promoting continued education in Engineering, Technology and Management.

Quality Policy

To ensure high standards in imparting professional education by providing world-class infrastructure, top-quality-faculty and decent work culture to sculpt the students into Socially Responsible Professionals through creative team-work, innovation and research

Vision of the Department

To impart technical knowledge and skills required to succeed in life, career and help society to achieve self sufficiency.

Mission of the Department

- To become an internationally leading department for higher learning.
- To build upon the culture and values of universal science and contemporary education.
- To be a center of research and education generating knowledge and technologies which lay groundwork in shaping the future in the fields of electrical and electronics engineering.
- To develop partnership with industrial, R&D and government agencies and actively participate in conferences, technical and community activities.

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Program Educational Objectives (B.Tech. – EEE)
Graduates will be able to

PEO 1: Have a successful technical or professional career, including supportive and leadership roles on multidisciplinary teams.

PEO 2: Acquire, use and develop skills as required for effective professional practices.

PEO 3: Able to attain holistic education that is an essential prerequisite for being a responsible member of society.

Program Outcomes (B.Tech. – EEE)
At the end of the Program, a graduate will have the ability to

PO 1: Apply knowledge of mathematics, science, and engineering.

PO 2: Design and conduct experiments, as well as to analyze and interpret data.

PO 3: Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

PO 4: Function on multi-disciplinary teams.

PO 5: Identify, formulates, and solves engineering problems.

PO 6: Understanding of professional and ethical responsibility.

PO 7: Communicate effectively.

PO 8: Broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

PO 9: Recognition of the need for, and an ability to engage in life-long learning.

PO 10: Knowledge of contemporary issues.

PO 11: Utilize experimental, statistical and computational methods and tools necessary for engineering practice.

PO 12: Demonstrate an ability to design electrical and electronic circuits, power electronics, power systems; electrical machines analyze and interpret data and also an ability to design digital and analog systems and programming them.

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COURSE OBJECTIVES

On completion of this Subject/Course the student shall be able to:

S.No	Objectives
1	To introduce the concept of DC circuits and its components.
2	To impart the knowledge of AC circuits ,Phasor algebra related to alternating quantities
3	To introduce the concept of principle of operation of transformer.
4	To understand the knowledge about DC machines and Induction motors.
5	To import the knowledge of various electrical installation and the concept of power, power factor and its improvement.

COURSE OUTCOMES

The expected outcomes of the Course/Subject are:

S.No	Outcomes
1.	Understand the importance of DC circuits and analyze theorems.
2.	Understand the concept of AC circuits and resonance.
3.	Concept of principle of operation of transformer and efficiency of single phase transformer.
4.	Analyze the performance of DC machines and Induction motors.
5.	Demonstrate the importance of electrical installation and the concept of power, power factor and its improvement

Signature of faculty

Note: Please refer to Bloom's Taxonomy, to know the illustrative verbs that can be used to state the outcomes.

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GUIDELINES TO STUDY THE COURSE / SUBJECT

Course Design and Delivery System (CDD):
- The Course syllabus is written into number of learning objectives and outcomes.
- Every student will be given an assessment plan, criteria for assessment, scheme of evaluation and grading method.
- The Learning Process will be carried out through assessments of Knowledge, Skills and Attitude by various methods and the students will be given guidance to refer to the text books, reference books, journals, etc.

The faculty be able to –
- Understand the principles of Learning
- Understand the psychology of students
- Develop instructional objectives for a given topic
- Prepare course, unit and lesson plans
- Understand different methods of teaching and learning
- Use appropriate teaching and learning aids
- Plan and deliver lectures effectively
- Provide feedback to students using various methods of Assessments and tools of Evaluation
- Act as a guide, advisor, counselor, facilitator, motivator and not just as a teacher alone

Signature of HOD   Signature of faculty

Date: Date:

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COURSE SCHEDULE

The Schedule for the whole Course / Subject is:

S. No.	Description	Duration (Date)		Total No. of Periods
		From	To	
1.	**Unit-I:** D.C. Circuits Electrical circuit elements (R, L and C), voltage and current sources, Ohm's Law, KVL & KCL, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. Time-domain analysis of first-order RL and RC circuits.	05.02.2024	27.02.2024	18
2.	**Unit-II:** A.C. Circuits Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series only), resonance in series R-L- C circuit. Three-phase balanced circuits, voltage and current relations in star and delta connections.	28.02.2024	16.03.2024	14
3.	**Unit-III:** Transformers Ideal and practical transformer, equivalent circuit, losses in transformers, OC&SC test on transformers, regulation and efficiency. Condition for maximum efficiency and applications.	18.03.2024	20.04.2024	18
4.	**Unit-IV:** Electrical Machines Construction and working principle of dc machine, performance characteristics of dc shunt machine. Generation of rotating magnetic field, Construction and working of a three- phase induction motor, Significance of torque-slip characteristics. Single-phase induction motor, Construction and working. Construction and working of synchronous generator.	22.04.2024	10.05.2024	17
5.	**Unit-V:** Electrical Installations Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.	03.06.204	12.06.2024	08

Total No. of Instructional periods available for the course: 75 Hours

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SCHEDULE OF INSTRUCTIONS - COURSE PLAN

Unit No.	Lesson No.	Date	No. of Periods	Topics / Sub-Topics	Objectives & Outcomes Nos.	References (Textbook, Journal)
1.	1	05.02.2024	1	Introdution to Electrical Elements	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	2	06.02.2024	1	Electrical circuit elements(R,L,andC)	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	3	07.02.2024	1	voltage and current sources	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	4	08.02.2024	1	Types of Network Elements	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	5	09.02.2024	1	Ohms law	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	6	12.02.2024	1	KVL&KCL	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	7	13.02.2024	1	Analysis of simple circuits with dc excitation	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	8	14.02.2024	1	Mesh Analaysis	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	9	15.02.2024	1	Numerical Problems	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	10	16.02.2024	1	Nodal analaysis	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	11	17.02.2024	1	Superposition Theorem	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	12	19.02.2024	1	Thevenin's Theorem	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	13	20.02.2024	1	Numerical Problems	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	14	21.02.2024	1	Norton's Theorem	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath

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	15	22.02.2024	1	Numerical Problems	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	16	23.02.2024	1	Time response of series RL Circuit	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	17	24.02.2024	1	Numerical Problems	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	18	26.02.2024	1	Time response of series RC Circuit	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	19	27.02.2024	1	Numerical Problems	1 1	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
2.	1	28.02.2024	1	Representation of sinusoidal waveforms, peak, rms and average values	2 2	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	2	29.02.2024	1	Single-phase AC circuits consisting of R,L,C	2 2	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	3	01.03.2024	1	Series RL Circuit	2 2	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	4	02.03.2024	1	Series RC Circuit	2 2	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	5	04.03.2024	1	Series RLC Circuit	2 2	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	6	05.03.2024	1	Numerical Problems	2 2	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	7	06.03.2024	1	Power factor, real power, reactive power, apparent power	2 2	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	8	07.03.2024	1	Resonance concept (series circuit only)	2 2	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	9	11.03.2024	1	Three-phase balanced circuits in Star Connection	2 2	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	10	12.03.2024	1	Three-phase balanced circuits in Delta Connection	2 2	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	11	13.03.2024	1	Numerical Problems	2 2	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath

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	12	14.03.2024	1	Numerical Problems	2 2	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	13	15.03.2024	1	Numerical Problems	2 2	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	14	16.03.2024	1	Numerical Problems	2 2	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
3.	1	18.03.2024	1	Introdution of Transformers	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	2	19.03.2024	1	Working Principle of singke phase Transformers	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	3	20.03.2024	1	Consrution of single phase transformer	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	4	21.03.2024	1	Ideal and practical single phase transformer	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	5	22.03.2024	1	Types of Transformers	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	6	23.03.2024	1	EMF Equation of single phase transformer	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	7	26.03.2024	1	Numerical Problems	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	8	27.03.2024	1	Numerical Problems	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	9	28.03.2024	1	Voltage Transformation Ratio	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	10	04.04.2024	1	Equivalent Circuit of single phase Transformer	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	11	06.04.2024	1	losses in single phase Transformer	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	12	08.04.2024	1	Open Circuit on single phase Transformer	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	13	10.04.2024	1	Short Circuit test on single phase Transformer	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath

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	14	15.04.2024	1	regulation and efficiency	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	15	16.04.2024	1	Condition for maximum Effficiency	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	16	18.04.2024	1	Apllications of single phase Transformer	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	17	19.04.2024	1	Numerical Problems	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	18	20.04.2024	1	Numerical Problems	3 3	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
4	1	22.04.2024	1	Construction and Principle of Operation of DC Machine	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	2	23.04.2024	1	Types of DC Generators	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	3	24.04.2024	1	Numerical Problems	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	4	25.04.2024	1	Numerical Problems	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	5	26.04.2024	1	EMF Equation of DC Generator	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	6	27.04.2024	1	Numerical Problems	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	7	29.04.2024	1	Principle of Operation of DC Motor	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	8	30.04.2024	1	Torque Equation of DC Motor	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	9	01.05.2024	1	Numerical Problems	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	10	02.05.2024	1	Types of DC Motors	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	11	03.05.2024	1	Numerical Problems	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath

	12	04.05.2024	1	Numerical Problems	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	13	06.05.2024	1	Magnetization and Load Characteristics of DC Generator	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	14	07.05.2024	1	Speed control of DC Shunt Motor	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	15	08.05.2024	1	Applications of DC Generators	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	16	09.05.2024	1	Applications of DC Motors	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	17	10.05.2024	1	Construction and Principle of operation of three phase Induction Motor	4 4	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
5	1	03.06.2024	1	Components of LT Switch gear	5 5	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	2	04.06.2024	1	Operation of MCB	5 5	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	3	05.06.2024	1	Types of wires,Cables	5 5	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	4	06.06.2024	1	Types of Batteries,Charecteristics	5 5	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	5	07.06.2024	1	Elementary calculations for Energy Consumption	5 5	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	6	10.06.2024	1	Power factor improvement	5 5	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	7	11.06.2024	1	Battery Backup	5 5	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath
	8	12.06.2024	1	Revision	1, 2, 3, 4, 5 1, 2, 3, 4, 5	Basic Electrical Engineering-D.P. Kothari and I. J. Nagrath

Signature of HOD   Signature of faculty

Date: Date:

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Note:
1. Ensure that all topics specified in the course are mentioned.
2. Additional topics covered, if any, may also be specified in bold.
3. Mention the corresponding course objective and outcome numbers against each topic.

LESSON PLAN (U-I)

Lesson No: 01,02,03,04,05   Duration of Lesson: 50 min

Instructional / Lesson Objectives:

- To introduce the concept of DC circuits and its components.
- To impart the knowledge of AC circuits, Phasor algebra related to alternating quantities
- To introduce the concept of principle of operation of transformer
- To understand the knowledge about DC machines and Induction motors.
- To import the knowledge of various electrical installation and the concept of power, power factor and its improvement.

Teaching AIDS   : PPTs, Digital Board
Time Management of Class   :

5 mins for taking attendance
40 mins for the lecture delivery
5 min for doubts session

Assignment / Questions:
(Note: Mention for each question the relevant Objectives and Outcomes Nos.1,2,3,4 & 1,3..)

Signature of faculty

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Date	Day	Week No	Classes per week	Topics to be covered
5/Feb/24	MON			Introdution to Electrical Elements
6/Feb/24	TUE			Electrical circuit elements(R,L,andC)
7/Feb/24	WED	1	5	voltage and current sources
8/Feb/24	THU			Types of Network Elements
9/Feb/24	FRI			Ohms law
10/Feb/24	SAT			**Second Saturday**
11/Feb/24	SUN			**SUNDAY**
12/Feb/24	MON			KVL&KCL
13/Feb/24	TUE			Analysis of simple circuits with dc excitation
14/Feb/24	WED	2	6	Mesh Analaysis
15/Feb/24	THU			Numerical Problems
16/Feb/24	FRI			Nodal analaysis
17/Feb/24	SAT			Superposition Theorem
18/Feb/24	SUN			**SUNDAY**
19/Feb/24	MON			Thevenin's Theorem
20/Feb/24	TUE			Numerical Problems
21/Feb/24	WED	3	6	Norton's Theorem
22/Feb/24	THU			Numerical Problems
23/Feb/24	FRI			Time response of series RL Circuit
24/Feb/24	SAT			Numerical Problems
25/Feb/24	SUN			**SUNDAY**
26/Feb/24	MON			Time response of series RC Circuit
27/Feb/24	TUE			Numerical Problems
28/Feb/24	WED	4	6	Representation of sinusoidal waveforms, peak, rms and average values
29/Feb/24	THU			Single-phase AC circuits consisting of R,L,C
1/Mar/24	FRI			Series RL Circuit
2/Mar/24	SAT			Series RC Circuit
3/Mar/24	SUN			**SUNDAY**
4/Mar/24	MON			Series RLC Circuit
5/Mar/24	TUE			Numerical Problems
6/Mar/24	WED	5	4	Power factor, real power, reactive power, apparent power
7/Mar/24	THU			Resonance concept (series circuit only)
8/Mar/24	FRI			**Maha Shivaratri**
9/Mar/24	SAT			**Second Saturday**
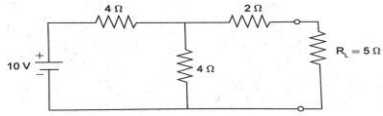
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Date	Day			Topic
10/Mar/24	SUN			**SUNDAY**
11/Mar/24	MON	**6**	**6**	Three-phase balanced circuits in Star Connection
12/Mar/24	TUE			Three-phase balanced circuits in Delta Connection
13/Mar/24	WED			Numerical Problems
14/Mar/24	THU			Numerical Problems
15/Mar/24	FRI			Numerical Problems
16/Mar/24	SAT			Numerical Problems
17/Mar/24	SUN			**SUNDAY**
18/Mar/24	MON	**7**	**6**	Introdution of Transformers
19/Mar/24	TUE			Working Principle of singke phase Transformers
20/Mar/24	WED			Consrution of single phase transformer
21/Mar/24	THU			Ideal and practical single phase transformer
22/Mar/24	FRI			Types of Transformers
23/Mar/24	SAT			EMF Equation of single phase transformer
24/Mar/24	SUN			**SUNDAY**
25/Mar/24	MON	**8**	**4**	**Holi**
26/Mar/24	TUE			Numerical Problems
27/Mar/24	WED			Numerical Problems
28/Mar/24	THU			Voltage Transformation Ratio
29/Mar/24	FRI			**Good Friday**
30/Mar/24	SAT			Numerical Problems
31/Mar/24	SUN			**SUNDAY**
1/Apr/24	MON	**9**	**2**	**I Mid Examinations**
2/Apr/24	TUE			**I Mid Examinations**
3/Apr/24	WED			**I Mid Examinations**
4/Apr/24	THU			Equivalent Circuit of single phase Transformer
5/Apr/24	FRI			**Babu Jagjivan Ram Jayanthi**
6/Apr/24	SAT			losses in single phase Transformer
7/Apr/24	SUN			**SUNDAY**
8/Apr/24	MON	**10**	**2**	Open Circuit on single phase Transformer
9/Apr/24	TUE			**Ugadi**
10/Apr/24	WED			Short Circuit test on single phase Transformer
11/Apr/24	THU			**Ramzan**
12/Apr/24	FRI			**Ramzan**
13/Apr/24	SAT			**Second Saturday**
14/Apr/24	SUN			**SUNDAY**
15/Apr/24	MON	**11**	**5**	regulation and efficiency
16/Apr/24	TUE			Condition for maximum Effficiency

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Date	Day	Unit	Classes	Topic
17/Apr/24	WED			**Ram Navami**
18/Apr/24	THU			Apllications of single phase Transformer
19/Apr/24	FRI			Numerical Problems
20/Apr/24	SAT			Numerical Problems
21/Apr/24	SUN			**SUNDAY**
22/Apr/24	MON	12	6	Construction and Principle of Operation of DC Machine
23/Apr/24	TUE			Types of DC Generators
24/Apr/24	WED			Numerical Problems
25/Apr/24	THU			Numerical Problems
26/Apr/24	FRI			EMF Equation of DC Generator
27/Apr/24	SAT			Numerical Problems
28/Apr/24	SUN			**SUNDAY**
29/Apr/24	MON	13	6	Principle of Operation of DC Motor
30/Apr/24	TUE			Torque Equation of DC Motor
1/May/24	WED			Numerical Problems
2/May/24	THU			Types of DC Motors
3/May/24	FRI			Numerical Problems
4/May/24	SAT			Numerical Problems
5/May/24	SUN			**SUNDAY**
6/May/24	MON	14	5	Magnetization and Load Characteristics of DC Generator
7/May/24	TUE			Speed control of DC Shunt Motor
8/May/24	WED			Applications of DC Generators
9/May/24	THU			Applications of DC Motors
10/May/24	FRI			Construction and Principle of operation of three phase Induction Motor
11/May/24	SAT			**Second Saturday**
12/May/24	SUN			**SUNDAY**
13/May/24	to 02-06-2024			**Summer vacation**
3/Jun/24	MON	15	5	Components of LT Switch gear
4/Jun/24	TUE			Operation of MCB
5/Jun/24	WED			Types of wires,Cables
6/Jun/24	THU			Types of Batteries,Charecteristics
7/Jun/24	FRI			Elementary calculations for Energy Consumption
8/Jun/24	SAT			**Second Saturday**
9/Jun/24	SUN			**SUNDAY**
10/Jun/24	MON	18	3	Power factor improvement
11/Jun/24	TUE			Battery Backup
12/Jun/24	WED			Revision
18-06-2024 to 20-06-2024				**II Mid Examinations**

Department of Electrical & Electronics Engineering

ASSIGNMENT – 1

Question No.	Question	Objective No.	Outcome No.
1	State and Explain Super position theorem with one example.	1	1
2	Find the current flowing through the Load resistance by using Norton's theorem.	1	1
3	Define RMS value and average value of an alternating quantity and Derive the Impedance of series R-C series circuit and draw the Impedance diagram.	2	2
4	Derive the necessary equations for line voltages and line currents in 3-Φ Balanced Star and Delta connected system.	2	2
5	State and Explain Faraday's Law of Electromagnetic Induction.	3	3

Signature of HOD   Signature of faculty

Date: Date:

Department of Electrical & Electronics Engineering

ASSIGNMENT – 2

Question No.	Question	Objective No.	Outcome No.
1	a) Explain the construction details of DC generator? b) A single-phase, 25Hz transformer has 50 primary turns and 600 secondary turns. The cross sectional area of the core is 400 sq.cm. If the primary of the Transformer is connected to a 50 HZ supply at 230 V. Find peak flux density and secondary induced voltage.	3	3
2	a) Derive an Emf Equation of DC generator. b) A 8- pole generator having wave-wound armature winding has 72 slots, each slot containing 40 conductors. What will be the voltage generated in the machine when driven at 1700 rpm assuming the flux per pole to be 5.0 mWb ?	4	4
3	Sketch the Torque-slip characteristics of Induction motor and explain.	4	4
4	What are the different types of wires and cables? Explain.	5	5
5	Calculate the monthly Energy Consumption and Electricity Bill. Assume the electricity rate as 5.00rs per unit. <table><tr><th>S. No.</th><th>Appliance name</th><th>No.</th><th>Rating in watts/unit</th><th>Operation time</th></tr><tr><td>1</td><td>Tubelights</td><td>3</td><td>40</td><td>6 hours</td></tr><tr><td>2</td><td>PL lamp</td><td>2</td><td>20</td><td>1 hour</td></tr><tr><td>3</td><td>Window type A/C</td><td>2</td><td>2000</td><td>4 hours</td></tr><tr><td>4</td><td>Domestic exhaust fan</td><td>1</td><td>100</td><td>3 hours</td></tr><tr><td>5</td><td>Toaster</td><td>1</td><td>750</td><td>15 mins</td></tr><tr><td>6</td><td>165 litre fridge</td><td>1</td><td>150</td><td>24 hours</td></tr></table>	5	5

Signature of HOD   Signature of faculty

Date: Date:

Department of Electrical & Electronics Engineering

TUTORIAL SHEET – 1

This tutorial corresponds to Unit No. 1 (Objective Nos.: 1, Outcome Nos.: 1)

Q1. List the active elements?
a) resistor   b) voltage c) Indutor   d) Diode

Q2. Capacitance unit____
a) farads b) ohms   c) henry d) Volts

Q3. Correct form of Ohm's Law.
a) V=IR   b) R=VI   c) R=I/V   d) None

Signature of HOD   Signature of faculty

Date: Date:

Department of Electrical & Electronics Engineering

TUTORIAL SHEET – 2

This tutorial corresponds to Unit No. 2 (Objective Nos.: 2, Outcome Nos.: 2)

Q1. The Power factor for pure resistive circuit
a) 0   b) 1   c) 0.9   d) None

Q2 peak value of Voltage Wave_____
a) Vm b) Im c) 1 d) Pm

Q3. What is the Phase angle for pure resistor through the AC source
a) 1 b) 0   c) 0.5   d) 0.7

Signature of HOD   Signature of faculty

Date: Date:

Department of Electrical & Electronics Engineering

TUTORIAL SHEET – 3

This tutorial corresponds to Unit No. 3 (Objective Nos.: 3, Outcome Nos.: 3)

Q1. Transformer core is made up of____

a) Copper   b) Silicon Steel   c) AL   d) None

Q2 Transformer rating is in_____
a) KW   b) KVA   c) KA   d) KH

Q3. Transformer works on the principle of _____
a) Mutual Flux   b) Opposing Flux   c) Leakage Flux   d) Lenz's law

Signature of HOD   Signature of faculty

Date: Date:

Department of Electrical & Electronics Engineering

TUTORIAL SHEET – 4

This tutorial corresponds to Unit No. 4 (Objective Nos.: 3, Outcome Nos.: 3)

Q1. The armature of DC motor is laminated to _____
a) To reduce mass   b) To reduce hysteresis loss
c) To reduce eddy current loss   d) To reduce inductance

Q2. Number of parallel paths in wave winding are _____
a)Equal to P   b) Equal to P/2   c) 2   d) Depends on other parameters

Q3. Direction of rotation of motor is determined by _____
a) Faraday's law   b) Lenz's law   c) Coulomb's law d) Fleming's left-hand rule

Signature of HOD   Signature of faculty

Date: Date:

Department of Electrical & Electronics Engineering

TUTORIAL SHEET – 5

This tutorial corresponds to Unit No. 5 (Objective Nos.: 5, Outcome Nos.: 5)

Q1. What does "MCB" stand for?
a) Miniature circuit breaker   b) Mini circuit breaker
c) Miniature capacitor breaker   d) Mini Capacitance breaker

Q2. Which of the following is not a requirement for a useful battery?

a) It should be light and compact   b) It should have a reasonable life span
c) It should ideally have a constant voltage throughout its lifespan
d) It should supply Alternating Current(AC)

Q3. Which one of the following is the practical unit of power?
a) Watt (W)   b) Kilowatt hour (kWh)   c) Horse power (hp)   d) Kilojoule (kJ)

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Date: Date:

Department of Electrical & Electronics Engineering

EVALUATION STRATEGY

Target (s)

    a. Percentage of Pass   : 95%

Assessment Method (s) (Maximum Marks for evaluation are defined in the Academic Regulations)

    a. Daily Attendance

    b. Assignments

    c. Online Quiz (or) Seminars

    d. Continuous Internal Assessment

    e. Semester / End Examination

List out any new topic(s) or any innovation you would like to introduce in teaching the subjects in this semester

Case Study of any one existing application

 Signature of HOD   Signature of faculty

Date: Date:

Department of Electrical & Electronics Engineering

COURSE COMPLETION STATUS

Actual Date of Completion & Remarks if any

Units	Remarks	Objective No. Achieved	Outcome No. Achieved
Unit 1	completed on 27.02.2024	1	1
Unit 2	completed on 16.03.2024	2	2
Unit 3	completed on 20.04.2024	3	3
Unit 4	completed on 10.05.2024	4	4
Unit 5	completed on 12.06.2024	5	5

Signature of HOD   Signature of faculty

Date: Date:

Department of Electrical & Electronics Engineering

Mappings

1. **Course Objectives-Course Outcomes Relationship Matrix**
   (Indicate the relationships by mark "X")

Course-Outcomes / Course-Objectives	1	2	3	4	5
1	H		M		
2		H			
3			H		
4				H	
5					H

2. **Course Outcomes-Program Outcomes (POs) & PSOs Relationship Matrix**
   (Indicate the relationships by mark "X")

P-Outcomes / C-Outcomes	a	b	c	d	e	f	g	h	i	j	k	l	PSO 1	PSO 2
1	H			M									H	
2		M	H			M							H	H
3					H				M		M			M
4						M	H						M	
5										H				

Department of Electrical & Electronics Engineering

Rubric for Evaluation

Performance Criteria	Unsatisfactory	Developing	Satisfactory	Exemplary
	1	**2**	**3**	**4**
Research & Gather Information	Does not collect any information that relates to the topic	Collects very little information some relates to the topic	Collects some basic Information most relates to the topic	Collects a great deal of Information all relates to the topic
Fulfill team role's duty	Does not perform any duties of assigned team role.	Performs very little duties.	Performs nearly all duties.	Performs all duties of assigned team role.
Share Equally	Always relies on others to do the work.	Rarely does the assigned work - often needs reminding.	Usually does the assigned work - rarely needs reminding.	Always does the assigned work without having to be reminded
Listen to other team mates	Is always talking—never allows anyone else to speak.	Usually doing most of the talking-- rarely allows others to speak.	Listens, but sometimes talks too much.	Listens and speaks a fair amount.

Department of Electrical & Electronics Engineering

I B.TECH II SEMESTER I MID EXAMINATIONS - APRIL 2024

Branch : B.Tech. (ECE) & (IT)   Max. Marks 30M

Date : 02 - Apr - 2024   Time : 120

Subject : Basic Electrical Engineering, EE204ES

PART - A

ANSWER ALL QUESTIONS   10 X 1M = 10M

Q.No	Question		CO	BTL
1.	List the passive elements? (A). resistor (B). voltage (C). current (D). Battery	( )	CO1	L1
2.	Capacitance unit____ (A). farads (B). ohms (C). henry (D). Volts	( )	CO1	L1
3.	Resistance unit____ (A). farads (B). ohms (C). henry (D). Volts	( )	CO1	L1
4.	List the active elements? (A). resistor (B). voltage (C). indutor (D). Diode	( )	CO1	L1
5.	What is value of peakfactor for sinusoidal wave? (A). 1.11 (B). 0 (C). 1.414 (D). 1	( )	CO2	L1
6.	What is the Phase angle for pure resistor through the AC source (A). 1 (B). 0 (C). 0.5 (D). 0.7	( )	CO2	L1
7.	What is value of formfactor for sinusoidal wave? (A). 1.11 (B). 0 (C). 1.414 (D). 1	( )	CO2	L1
8.	An R-L circuit with R=20 and XL= 15 Find the power factor of the circuit? (A). 0.9 (B). 0.8 (C). 1 (D). 0.95	( )	CO2	L2
9.	Lenz's Law States____ (A). Mutual Flux (B). Opposing Flux (C). Leakage Flux (D). None	( )	CO3	L1
10.	Transformer core is made up of___ (A). Copper (B). Slicon Steel (C). AL (D). None	( )	CO3	L1

Department of Electrical & Electronics Engineering

PART - B

ANSWER ANY FOUR

4 X 5M = 20M

Q.No	Question	CO	BTL
11.	Derive the equivalent resistance when the resistors are connected i) Series ii) Parallel	CO1	L2
12.	Explain the Time domain analysis of series RC Circuit	CO1	L3
13.	A resistance of 12, inductance of 0.15H, capacitance of 100µF are connected in series across 100V,50HZ supply. calculate 1)impedance 2)current 3)power factor 4)power consumed.	CO2	L3
14.	Derive the Impedance of series RL Circuit and draw the impedance diagram.	CO2	L3
15.	A single phase transformer has 350 primary and 1,050 secondary turns. The net cross-sectional area of the core is 55 cm2. If the primary winding be connected to a 400 V, 50 Hz single phase supply, calculate (i) maximum value of the flux density in the core and (ii) the voltage induced in the secondary winding.	CO3	L3
16.	Explain the construction and working principle of Single phase Transformer	CO3	L3

Department of Electrical & Electronics Engineering

I B.TECH II SEMESTER II MID EXAMINATIONS - JUNE 2024

Branch : B.Tech. ECE & IT   **Max. Marks : 30M**
Date : 19-Jun-2024   Session : Morning   **Time : 120 Min**
Subject : Basic Electrical Engineering,EE204ES

PART - A

ANSWER ALL THE QUESTIONS   10 X 1M = 10M

Q.No	Question		CO	BTL
1.	Open circuit test on transformers is conducted so as to get	( )	CO3	L1
	(A). Hysteresis losses (B). Copper losses (C). Core losses (D). Eddy current losses			
2.	An ideal transformer will have maximum efficiency at a load such that	( )	CO3	L1
	(A). copper loss > iron loss (B). cannot be determined (C). copper loss = iron loss (D). copper loss < iron loss			
3.	What will happen, with the increase in speed of a DC motor?	( )	CO4	L2
	(A). Back emf increase but line current falls. (B). Back emf falls and line current increase. (C). Both back emf as well as line current increase. (D). Both back emf as well as line current fall.			
4.	What is Self-excitation in DC shunt generator?	( )	CO4	L2
	(A). Field winding is connected in series of armature (B). Field winding is connected in parallel of armature (C). Field winding is not connected to the armature (D). Field Winding is not excited			
5.	The armature of DC motor is laminated to _____	( )	CO4	L1
	(A). To reduce mass (B). To reduce hysteresis loss (C). To reduce eddy current loss (D). To reduce inductance			
6.	Direction of rotation of motor is determined by _____	( )	CO4	L1
	(A). Faraday's law (B). Lenz's law (C). Coulomb's law (D). Fleming's left-hand rule			
7.	Which of the following energy is converted to electricity by the battery?	( )	CO5	L1
	(A). Mechanical energy (B). Chemical energy (C). Thermal energy (D). Electrical energy			

Department of Electrical & Electronics Engineering

8. The SI unit of electrical energy is _____ ( ) CO5 L1
   (A). kilojoule (KJ)   (B). joules (J)   (C). watt (W)   (D). kilowatt (KW)

9. What is the principal on which MCB (Miniature circuit breaker) works ? ( ) CO5 L2
   (A). Magnetic effect of electric current   (B). Lenz law   (C). Faradays law of electric current
   (D). Flemings Right hand rule

10. Which of the following is not a requirement for a useful battery? ( ) CO5 L2
    (A). It should be light and compact   (B). It should have a reasonable life span   (C). It should
    ideally have a constant voltage throughout its lifespan   (D). It should supply Alternating
    Current(AC)

PART - B

ANSWER ANY FOUR   **4 X 5M = 20M**

Q.No	Question	CO	BTL
11.	What are the different types of losses in transformer and also derive condition for maximum efficiency.	CO3	L3
12.	In a 100 kVA transformer, the iron loss is 450 W and full-load copper loss is 900 W. Find the transformer efficiency at full load and the maximum efficiency of the transformer, where the load power factor is 0.8 lagging.	CO3	L4
13.	Explain with suitable diagram how rotating magnetic field is produced in 3- induction motor.	CO4	L4
14.	What are the speed controlling methods in a DC motor and also write the applications.	CO4	L3
15.	Write the function of (i) Fuse (ii) Relay (iii) Circuit breaker.	CO5	L4
16.	Calculate the electricity bill amount for a month of 31 days, if the following devices are used as specified: a) 3 bulbs of 30 watts for 5 hours b) 4 tube lights of 50 watts for 8 hours c) 1 fridge of 300 watts for 24 hours Given the rate of electricity is 2 Rs. per unit.	CO5	L4

Department of Electrical & Electronics Engineering

Continuous Internal Assessment (R-22)

Programme: **BTech-IT**   Year: **I**   Course: **Theory**   A.Y: **2023-24**

Course: Basic Electrical Engineering   Section: A   Faculty Name: S.Yasoda Krishna

S. No	Roll No	MID-I (35M)	MID-II (35M)	Avg. of MID I & II	Viva-Voce/Poster Presentation (5M)	Total Marks (40)
1	23C11A1201	12	13	13	5	18
2	23C11A1202	10	0	5	AB	5
3	23C11A1203	35	34	35	5	40
4	23C11A1204	15	16	16	5	21
5	23C11A1205	19	12	16	5	21
6	23C11A1206	35	34	35	5	40
7	23C11A1207	35	23	29	5	34
8	23C11A1208	10	0	5	5	11
9	23C11A1209	30	23	27	5	32
10	23C11A1210	35	33	34	5	39
11	23C11A1211	15	24	20	5	25
12	23C11A1212	33	28	31	5	36
13	23C11A1213	35	35	35	5	40
14	23C11A1214	15	21	18	5	23
15	23C11A1215	32	34	33	5	38
16	23C11A1216	18	20	19	5	24
17	23C11A1217	7	5	7	5	12
18	23C11A1218	16	17	17	5	22
19	23C11A1219	15	20	18	5	23

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20	23C11A1220	24	28	26	5	31
21	23C11A1221	35	34	35	5	40
22	23C11A1222	31	28	30	5	35
23	23C11A1223	33	29	31	5	36
24	23C11A1224	13	5	9	5	15
25	23C11A1225	35	26	31	5	36
26	23C11A1226	15	10	13	5	18
27	23C11A1227	33	31	32	5	37
28	23C11A1228	13	25	19	5	24
29	23C11A1229	18	20	20	5	25
30	23C11A1230	18	27	23	5	28
31	23C11A1231	31	29	30	5	35
32	23C11A1232	30	29	30	5	35
33	23C11A1233	15	17	16	5	21
34	23C11A1234	25	27	26	5	31
35	23C11A1235	7	5	6	5	12
36	23C11A1236	10	18	14	5	19
37	23C11A1237	35	30	33	5	38
38	23C11A1239	35	32	34	5	39
39	23C11A1242	35	34	35	5	40
40	23C11A1243	10	18	14	5	19
41	23C11A1244	17	13	15	5	20
42	23C11A1245	30	24	27	5	33
43	23C11A1246	34	30	32	5	37
44	23C11A1247	34	26	30	5	35
45	23C11A1248	18	12	15	5	20

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46	23C11A1249	10	14	12	5	18
47	23C11A1250	25	30	28	5	33
48	23C11A1251	31	28	30	5	35
49	23C11A1252	25	20	23	5	28
50	23C11A1253	35	35	35	5	40
51	23C11A1254	30	26	28	5	33
52	23C11A1255	35	35	35	5	40
53	23C11A1256	14	14	14	5	19
54	23C11A1257	18	17	18	5	23
55	23C11A1259	22	20	21	5	26

No. of Absentees: <u>00</u>

Total Strength: <u>55</u>

Signature of Faculty

Signature of HoD

Department of Electrical & Electronics Engineering

Continuous Internal Assessment (R-22)

Programme: **BTech-ECE**   Year: **I**   Course: **Theory**   A.Y: 2023-24

Course: Basic Electrical Engineering   Section: A   Faculty Name: S.Yasoda Krishna

S. No	Roll No	MID-I (35M)	MID-II (35M)	Avg. of MID I & II	Viva-Voce/Poster Presentation (5M)	Total Marks (40)
1	22C11A0406	22	22	22	5	27
2	22C11A0412	15	16	16	5	21
3	23C11A0401	31	26	29	5	34
4	23C11A0402	33	23	28	5	33
5	23C11A0403	15	24	20	5	25
6	23C11A0404	34	32	33	5	38
7	23C11A0405	19	20	20	5	25
8	23C11A0406	25	21	23	5	28
9	23C11A0407	14	26	20	5	25
10	23C11A0408	29	26	28	5	33
11	23C11A0409	25	21	23	5	28
12	23C11A0410	23	24	24	5	29
13	23C11A0411	25	24	25	5	30
14	23C11A0412	23	21	22	5	27
15	23C11A0413	30	35	33	5	38
16	23C11A0414	20	16	18	5	23
17	23C11A0415	24	23	24	5	29
18	23C11A0416	19	18	19	5	24
19	23C11A0417	33	31	32	5	37

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20	23C11A0418	15	19	17	5	22
21	23C11A0419	26	25	16	5	31
22	23C11A0420	35	33	34	5	39
23	23C11A0421	17	20	19	5	24
24	23C11A0422	18	17	18	5	23
25	23C11A0423	18	23	21	5	26
26	23C11A0424	31	24	28	5	33
27	23C11A0425	31	33	32	5	37
28	23C11A0426	20	20	20	5	25
29	23C11A0427	29	25	27	5	32
30	23C11A0428	29	22	26	5	31
31	23C11A0429	25	23	24	5	29
32	23C11A0430	35	30	33	5	38
33	23C11A0431	32	27	30	5	35
34	23C11A0432	27	14	21	5	26
35	23C11A0433	24	19	22	5	27
36	23C11A0434	13	16	15	5	20
37	23C11A0435	15	23	19	5	24
38	23C11A0436	30	21	27	5	31
39	23C11A0437	34	21	28	5	33
40	23C11A0438	22	16	19	5	24
41	23C11A0439	30	24	27	5	32
42	23C11A0440	20	23	22	5	27
43	23C11A0441	33	28	31	5	36
44	23C11A0442	19	24	22	5	27
45	23C11A0443	11	14	13	5	18

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46	23C11A0444	14	13	14	5	19
47	23C11A0445	15	18	17	5	22
48	23C11A0446	35	20	28	5	33
49	23C11A0447	15	19	17	5	22
50	23C11A0448	34	21	28	5	33
51	23C11A0449	15	5	10	5	15
52	23C11A0450	35	32	34	5	39
53	23C11A0451	35	34	35	5	40
54	23C11A0452	23	23	23	5	28
55	23C11A0453	21	23	22	5	27
56	23C11A0454	21	22	22	5	27
57	23C11A0455	35	34	35	5	40
58	23C11A0456	28	33	31	5	36
59	23C11A0457	35	35	35	5	40

No. of Absentees: <u>00</u>

Total Strength: <u>59</u>

Signature of Faculty

Signature of HoD