Department of Information Technology

Basic Electrical Enginering

II B.Tech I Sem (IT – A & B)

P.HEMERA
Asst. Professor
J.B.Institute of Engineering & Technology
Yenkapally(Vill), Himayath Nagar(Post),
Moinabad(Mdl), Hydreabad.

Results Target

Total Strength of the Class: 105

S. No	Class / Division	No. of Students
a.	First Class with Distinction	
b.	First Class	
c.	Pass Class	

Method of Evaluation:

a.	Internal Examination	2
b.	Unit Wise Assignments	4
c.	Descriptive Exam	2
d	Objective	2
e.	Final Examination	1

J.B.Institute of Engg & Technology

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Syllabus

Subject Name : Basic Electrical Engineering Subject Code : R0953025

Class : II B.Tech

Sl.No	Unit No:	Details of the unit
01	Unit – I	ohm's Law, basic circuit components,kirchhoff's laws.
02	Unit – II	types of elements, types of sources, series parallel circuits, Star-Delta transformation, network theorems
03	Unit – III	Fundamentals of AC quantities, average RMS values of AC quantities, form factor, peak factor, about J operator,phasor algebra, analysis of AC single element & series circuits
04	Unit – IV	**TRANSFORMERS:** Construction, principle of operation, ideal & practical transformers,losses,tests& efficiency calculations, regulations
05	Unit – V	**DC GENERATORS:** principle of operation, types of DC generators,e.m.f equation .
06	Unit - VI	**DC MOTORS:** Principle of operation,types,losses & torque equation, efficiency calculations
07	Unit - VII	**AC MACHINES:** Three phase induction motor, principle of operation, slip & rotor frequency, torque
08	Unit - VIII	**INSTRUMENTATION**: Classification, essential features,PMMC,MI meters

Books / Material

Text Books (TB)
TB1. Principles of electrical & electronics engg by V.K.Mehta & Rohit Mehta

Suggested / Reference Books (RB)
RB1. Basic electrical engg by:T.K.Nagaskar

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SUBJECT PLAN :

Subject Name : Basic Electrical Enginer Subject Code : R0953025

Class : II B.Tech Faculty Name : P.Hemara

Number of Hours / Lectures available in this Semester / Year 65

Unit	Topic	Total No. of Hours
I	ohm's Law, basic circuit components,kirchhoff's laws.	**08**
II	types of elements, types of sources, series parallel circuits, Star-Delta transformation, network theorems	**13**
III	. Fundamentals of AC quantities, average RMS values of AC quantities, form factor, peak factor, about J operator,phasor algebra, analysis of AC single element & series circuits	**09**
IV	**TRANSFORMERS:** Construction, principle of operation, ideal & practical transformers,losses,tests& efficiency calculations, regulations	**11**
V	**DC GENERATORS:** principle of operation, types of DC generators,e.m.f equation .	**07**
VI	**DC MOTORS:** Principle of operation,types,losses & torque equation, efficiency calculations	**08**
VII	**AC MACHINES:** Three phase induction motor, principle of operation, slip & rotor frequency, torque	**06**
VIII	. **INSTRUMENTATION**: Classification, essential features,PMMC,MI meters	**04**
	Total	**66**

J.B. Institute of Engineering & Technology

Department of IT

LESSON PLAN

Subject Name: BEE **Subject Code:**

Class: B.Tech.II –IT Semester-I **Faculty P.Hemara**

S.No	Topic as per JNTU syllabus	*Lessons#	Suggested Books ** (Refer the list)	Question Bank			Hand outs
				OQ	DQ	AQ	
	Unit 1						
1	Ohm's law	2	TB-1	1-1	1-1	A1	H1
2	Problems on ohm's law	2	TB-1		1-2		
3	Basic circuit components	2	TB-1.4	1-3	1-3		
4	Kirchhoff's laws	2	TB-1.	1-2	1-5		
5	Numerical problems	1	TB-2.1		1-6		H2
	Unit 2						
6	Basic definations and types of elements	1	TB-2.3.	1-5	1-9	A1	
7	Types of sources,resistive networks	1	TB-2.5	1-4	1-9	A1	
8	Inductive networks,capacitive networks	2	RB1-1,	1-6	1-10	A1	H3
9	**Series parallel circuits**	1					
10	Star delta and delta star transformations	2	TB-2.7	1-8	2-11	A1	
11	Network theorems and simple problems	3	TB –1	1-10	2-12	A1	
	Unit 3						
12	Principles of a.c voltages,wave forms and basic definations	2	TB-2		2-14		
13	Rms,average values of alternating currents and voltage	2	TB –2		2-15		
14	Form factor,peak factor,phasor representation of alternating quantities	2	TB -2		2-16		H5
15	J-operator,phasor algebra,	1	TB		2-17		
16	analysis of a.c circuit with single basic network element	3	TB 5.2,		2-18		H6
17	Single phase series circuits	1	TB-5.2, RB1-3.1		2-19		
	Unit 4						
18	Principles of operation,constructional details	2	TB-2				

19	ideal transformer and practical transformer,losses, tests,	1	TB-2				
20	efficiency and regulation calculations	1	TB-2				
S.No	**Topic as per JNTU syllabus**	***Lessons#**	**Suggested Books ** (Refer the list)**	**Question Bank** OQ	DQ	AQ	**Hand outs**
	Unit 5						
21	Principle of operation of d.c motors	2	TB-3.1		2-23	A2	H7
22	types of d.c motors	2	TB-3.2.		2-24	A2	
23	,losses and torque equations,	2	TB-3.3.		2-25	A2	
24	losses and efficiency calculations in d.c generators	2	TB-3.4.		2-26	A2	
	Unit 6						
25	Principle of operation of d.c.machine	2	TB-3.7.		2-28	A2	
26	types of d.c generators	2	TB-4.1		2-29		H8
27	,e.m.f equation in d.c generators	1	TB-4.2		2-30		
28	problems	1	TB-4.3.		2-31		
	Unit 7						
29	3-phase induction motors,principle of operation,	3	TB-4.5,4.6		2-33	A2	
30	principle of operation	1					
31	slip and rotor frequency,torqur,	2	TB-6.1, 6.2, VI6		2-34		H9
32	Simple problems	1	TB-6.3		2-35		
	unit 8						
33	Introduction,classification of instruments	2	TB-6.7		2-37		
34	operating principles, essential features of measuring instruments,	2					
35	PMMC instruments	1	TB-8.1,				H10
36	Moving iron of ammeter and voltmeters	1	TB-8.3		2-38		
	Total Lessons	**60**					

Abbreviations and Notes

OQ: Objective Questions DQ: Descriptive Questions AQ : Assignment Questions

TB : Text Book SB :Suggested reference books (SB)

Text Book:
TB1 . basic electrical engineering-M.S.NAIDU and S.KAMAKSHIAH
TB2. basic electrical engineering by T.K.Nagasarkar and M.S.Sukhija

. **Reference:**
RB1: theory and problems of basic electrical engineering by D.P.Kothari and I.J.Nagrath
RB2. : principles of electrical engineering by V.K.Mehta,S.Chand publications.

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LESSON PLAN :

Subject Name : Basic Electrical Enginer Subject Code : R0953025

Class : II B.Tech Faculty Name : P.Hemara

LECTURE PLAN:

Unit -1 : ohm's Law, basic circuit components,kirchhoff's laws.

OBJECTIVE QUESTIONS :

1.The electricity is due to (c)

(a)+ve charges only (b)-ve charges only
(c) both a&b (d)none

2. ohm's law is stated at constant (a)

(a)Temperature (b) voltage
(c) current (d)none

3. kcl & kvl applicable to (a)

(a)linear elements (b)non linear elementa
(c) both a&b (d)none

ASSIGNMENT QUESTIONS:

Assignments:

1. Explain about ohm's law
2. What are the different types of network elements explain them in detail
3. Explain kirchhoff's laws with suitable circuits

Unit -2 : types of elements, types of sources, series parallel circuits, Star-Delta transformation, network theorems

S.No	Topic Name	Number of lecture hours scheduled
1	types of elements	1

2	types of sources	1
3	series parallel circuits	2
4	Star-Delta transformation	2
5	network theorems	4
6	numerical	3

OBJECTIVE QUESTIONS :

1.The bilateral,linear&passive elements are (a)

(a)R,L,C (b)R
(c) both a&b (d)none

2. the internal resistance of voltage sourse is in_____ with it (a)

(a)series (b) parallel
(c) star (d)delta

3: if in star connection each arm resistance is "R" then in delta equivqlent (a)

(a) 3R (b)R/3
(c) both a&b (d)none

4: if in delta connection each arm resistance is "R" then in star equivqlent (b)

(a) 3R (b)R/3
(c) both a&b (d)none

ASSIGNMENT QUESTIONS:

Assignments:

1. What are different type of network elements explain them in detail
2. Describe different type of electric sources
3. deduct the proper expressions for STAR & DELTA & also conversion expressions
4. write about THEVENIN'S,SUPERPOSITION & MAXIMUM POWER TRANSFER Theorems

Unit -3: Fundamentals of AC quantities, average RMS values of AC quantities, form factor, peak factor, about J operator,phasor algebra, analysis of AC single element & series circuits

S.No	Topic Name	Number of lecture hours scheduled
1	Fundamentals of AC quantities	1
2	average RMS values of AC quantities	1
3	form factor, peak factor	1
4	about J operator	1
5	phasor algebra	2
6	analysis of AC single element & series circuits	3

OBJECTIVE QUESTIONS :

1.magnitude of "j" operator is (b)

(a)1 (b)-1
(c) both a&b (d)none

2. any phasor multiplied by of "j" operator shifts its direction by (b)

(a) 90 degrees clock wise (b) 90 degrees anti clock wise
(c) both a&b (d)none

3: in R-L series circuit the current_____voltage by an angle ø (a)

(a) lags (b)leads
(c) both a&b (d)none

ASSIGNMENT QUESTIONS:

1. Explain know average,RMS values
2. explain form factor & peak factor
3. write about R-L,R-C,R-L-C series circuits

Unit 4: **TRANSFORMERS:** Construction, principle of operation, ideal & practical transformers,losses,tests& efficiency calculations, regulations

S.No	Topic Name	Number of lecture hours scheduled
1	Construction	2
2	principle of operation	1
3	ideal & practical transformers	3
4	losses, tests& efficiency calculations, regulation	5

OBJECTIVE QUESTIONS :

1.the transformer works on the principal of (a)

(a)electro magnetic induction (bconduction
(c) both a&b (d)none

2. to find the equivalent parameters of transformer which test should be done (C)

(a) open ckt test (b) short ckt test
(c) both a&b (d)none

3: the regulation of transformer is +ve & (-ve,0) respectively for (a)

(a) lag & lead (b)lead & lag
(c) both a&b (d)none

ASSIGNMENT QUESTIONS:

Assignments:

1. Explain briefly about trans former construction
2. What do you mean by ideal & practical transformers & give the differences between them
3. what are the transformer losses?
4. derive the expression for t/f efficiency & regulation

Unit -5:DC GENERATORS: principle of operation, types of DC generators,e.m.f equation

S.No	Topic Name	Number of lecture hours scheduled
1	Principle of operation & types	4
2	e.m.f equation	3

OBJECTIVE QUESTIONS :

1.the commutator works as _____in the DC Generator (b)

(a)rectifier (b)mechanical rectifier
(c) both a&b (d)none

2. in which type of dc generator both shunt & series field windins are present (C)

(a) DC Series (b) DC shunt
(c) DC compound (d)none

3: The generated emf equation in a DC generator is inversely proportional to (a)

(a) no of parallel paths (b)flux
(c) both a&b (d)none

ASSIGNMENT QUESTIONS:

Assignments:

1. What is DC generator? explain its operation

2. derive the e.m.f equation in DC generator

Unit -6:DC MOTORS: Principle of operation,types,losses & torque equation, efficiency calculations

S.No	Name	Number of lecture hours scheduled
1	Principle of operation	1
2	Types of DC motors	1
3	torque equation, efficiency calculations	3
4	Numerical	3

OBJECTIVE QUESTIONS :

1.which machine takes the DC power as input & gives the mechanical power as output (a)

(a)DC motor (b)DC generator
(c) both a&b (d)none

2. if DC series motor is started on no load then then its speed (C)

(a) 0 (b) -ve
(c) ∞ (d)none

3: The Back emf equation in a DC generator is inversely proportional to (a)

(a) no of parallel paths (b)flux
(c) both a&b (d)none

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ASSIGNMENT QUESTIONS:

1.explain different types DC motors in details
2. explain principle of operation of DC motor & derive torque equation
3. explain the efficiency of DC motor

Unit -7: AC MACHINES: Three phase induction motor, principle of operation, slip & rotor frequency, torque

S.No	Topic Name	Number of lecture hours scheduled
1	Three phase induction motor	1
2	principle of operation	1
3	slip	1
4	Rotor frequency	1
5	Torque calculations	2

OBJECTIVE QUESTIONS :

1.if in 3 phase induction motor any two of the supply mains are reversed then the rotor rotation (a)

(a)reverses (b)remains same
(c) both a&b (d)none

2. if Ns=Nr then slip (a)

(a) 0 (b) -ve
(c) ∞ (d)none

3: if s=0.2 & f=50hz then rotor frequency of 3 phase induction motor (a)

(a) 10hz (b)0
(c) 50 (d)none

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ASSIGNMENT QUESTIONS:

1. explain the principle of operation of 3 phase induction motor

2:Explain the words SLIP & ROTORE FREQUENCY in induction motor

Unit -8:INSTRUMENTATION: Classification, essential features,PMMC,MI meters

S.No	Topic Name	Number of lecture hours scheduled
1	Classification,	1
2	essential features	1
3	PMMC	1
4	MI meters	1

OBJECTIVE QUESTIONS :

1.To measure DC quantities what type of meters are used (a)

(a)MC (b)MI (c) both a&b (d)none

2.To measure AC quantities what type of meters are used (b)

(a)MC (b)MI (c) both a&b (d)none

3: if deflecting torque balances controlling torque then popinter in mc meter (a)

(a) settle down at a reading (b)fluctuates
(c) both a&b (d)none

ASSIGNMENT QUESTIONS:

Assignments:

1: write about the classification of metering devices

2. write about PMMC meter

3. write about MI meter

DEPARTMENT OF INFORMATION TECHNOLOGY

INDIVIDUAL TIME TABLE

NAME OF THE FACULTY*:* BABA FAKRUDDIN.M

Period	1	2	3	4		5	6	7
Day/Time	9.00-9.50	9.50-10.40	10.40-11.30	11.30-12.20	LUNCH	12.50-1.40	1.40-2.30	2.30-3.20
Mon				IT-B		IT-A		
Tue	IT-B			IT-A				
Wed			IT-A	IT-B				
Thu							IT-A	
Fri		IT-B				IT-A		
Sat			IT-B					

BEE:

Total no of theory classes : 10
Total no of practical classes : 00
Total no of classes : 10