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St. JOSEPH'S COLLEGE OF ENGINEERING

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25

We Make You Shine

St. JOSEPH'S INSTITUTE OF TECHNOLOGY

St. Joseph's Group of Institutions

OMR,CHENNAI - 600 119

SUMMARY OF CLASS WORK

RECORD OF ATTENDANCE AND ASSESSMENT

Name of the Staff: S. P. Vedavalli

Department of the Staff : EEE

Semester From : Aug 2020 To Oct 2020

Class & Branch : III EEE - C

Code No. / Subject Name : EE8552 - Electronics

EE8552 **POWER ELECTRONICS** L T P C 3 0 0 3

OBJECTIVES:

To impart knowledge on the following Topics

- Different types of power semiconductor devices and their switching
- Operation, characteristics and performance parameters of controlled rectifiers Operation, switching techniques and basics topologies of DC-DC switching regulators.
- Different modulation techniques of pulse width modulated inverters and to understand harmonic reduction methods.
- Operation of AC

UNIT I POWER SEMI-CONDUCTOR DEVICES 9

Study of switching devices, SCR, TRIAC, GTO, BJT, MOSFET, IGBT and IGCT- Static characteristics: SCR, MOSFET and IGBT - Triggering and commutation circuit for SCR, Introduction to Driver and snubber circuits.

UNIT II PHASE-CONTROLLED CONVERTERS 9

2-pulse, 3-pulse and 6-pulseconverters– performance parameters –Effect of source inductance— Firing Schemes for converter–Dual converters, Applications-light dimmer, Excitation system, Solar PV systems.

UNIT III DC TO DC CONVERTERS 9

Step-down and step-up chopper-control strategy– Introduction to types of choppers-A, B, C, D and E -Switched mode regulators- Buck, Boost, Buck- Boost regulator, Introduction to Resonant Converters, Applications-Battery operated vehicles.

UNIT IV INVERTERS 9

Single phase and three phase voltage source inverters (both1200 mode and 1800 mode)– Voltage& harmonic control--PWM techniques: Multiple PWM, Sinusoidal PWM, modified sinusoidal PWM – Introduction to space vector modulation –Current source inverter, Applications-Induction heating, UPS.

UNIT V AC TO AC CONVERTERS 9

Single phase and Three phase AC voltage controllers–Control strategy- Power Factor Control – Multistage sequence control -single phase and three phase cyclo converters – Introduction to Matrix converters, Applications –welding .

TOTAL : 45 PERIODS

OUTCOMES:

- Ability to analyse AC-AC and DC-DC and DC-AC converters.
- Ability to choose the converters for real time applications.

TEXT BOOKS:

1. M.H. Rashid, 'Power Electronics: Circuits, Devices and Applications', Pearson Education, Third Edition, New Delhi, 2004.
2. P.S.Bimbra "Power Electronics" Khanna Publishers, third Edition, 2003.
3. Ashfaq Ahmed 'Power Electronics for Technology', Pearson Education, Indian reprint, 2003.

REFERENCES

1. Joseph Vithayathil,' Power Electronics, Principles and Applications', McGraw Hill Series, 6th Reprint, 2013.
2. Philip T. Krein, "Elements of Power Electronics" Oxford University Press, 2004 Edition.
3. L. Umanand, "Power Electronics Essentials and Applications", Wiley, 2010.
4. Ned Mohan Tore. M. Undel and, William. P. Robbins, 'Power Electronics: Converters, Applications and Design', John Wiley and sons, third edition, 2003.
5. S.Rama Reddy, 'Fundamentals of Power Electronics', Narosa Publications, 2014.
6. M.D. Singh and K.B. Khanchandani, "Power Electronics," Mc Graw Hill India, 2013.
7. JP Agarwal," Power Electronic Systems: Theory and Design" 1e, Pearson Education, 2002.

S1 : 10.00 to 11.00 .

S2 : 11.00 to 12.00

S3 : 12.00 to 1.00

S4 : 2.00 to 3.00

TIME TABLE

Period / Day	1	2	3	4	5	6	7	8	9	10
Monday	S2 EE8552									
Tuesday			S3 EE8552							
Wednesday	S1 EE8552									
Thursday			S3 EE8552							
Friday										

LESSON PLAN

Unit : 1 From 12/8/2020 To 27/8/2020 No. of Hours : 09

Unit-I:POWERSEMI-CONDUCTOR DEVICES

Target Period: 9 Planned Periods: 12

S.NO	Topics to be Covered	Course Outcome	Hours Required	Text/Reference Book	Teaching Aid	Knowledge Level
1.	Introduction to power electronics switching devices	C303.1	1	M.H.Rashid, P.S.Bimbra "Power Electronics"	PPT	R,U
2.	Basic Operation, V-I characteristics and switching characteristics of SCR.		1		Black Board	R,U,An
3.	Basic Operation, V-I characteristics and switching characteristics of TRIAC.		1		Black Board	R,U,An,
4.	Basic Operation, V-I characteristics and switching characteristics of GTO and BJT.		1		Black Board	R,U,An,
5.	Basic Operation, V-I characteristics and switching characteristics of MOSFET.		1		Black Board	R,U,An,
6.	Basic Operation, V-I characteristics and switching characteristics of IGBT.		2		PPT	R,U,An
7.	Basic Operation, V-I characteristics and switching characteristics of IGCT.		1		Black Board	R,U,An,
8.	Various types of commutation circuits and triggering circuits for SCR		2		Black Board	R,U,An,
9.	Introduction of Driver and snubber circuit.		1		Black Board	R,U,An,

Assignment submission: 20/8/2020 Seminar/Tutorial: 24/8/2020 Construction details of IGBT Internal Assessment 1: 2/9/2020

LESSON PLAN

Unit : II From 01/09/2020 To 16/09/2020 No. of Hours : 09

Unit-II PHASE CONTROLLED CONVERTERS

Target Period: 9 Planned Periods: 12

S.NO	Topics to be Covered	Course Outcome	Hours Required	Text/Reference Book	Teaching Aid	Knowledge Level
1.	Analysis and basic operation of single phase fully controlled converter.	C303.2	1	P.S.Bimbra "Power Electronics" M.H.Rashid, "Power Electronics"	Black Board	R,U,
2.	Analysis and basic operation of single phase Half controlled converter.		2		Black Board	R,U,An,
3.	Analysis and basic operation of Three phase Half wave controlled converter.		1		Black Board	R,U,An,
4.	Analysis and basic operation of Three phase Full wave controlled converter		1		PPT	R,U,An,
5.	Effect of source inductance in single phase converter		2		Black Board	R,U,An,
6.	Effect of source inductance in Three phase converter		1		Black Board	R,U,An,
7.	Various types of gate circuit schemes for phase control converters.		1		PPT	R,U,An,
8.	Analysis and basic Working of Dual converter.		1		Black Board	R,U,An,
9.	Applications-light dimmer, Excitation system, Solar PV systems		1		Black Board	R,U,An,
10.	Tutorial		1		Black Board	R,U,An,

Assignment submission: 24/9/2020 Seminar/Tutorial: – Internal Assessment 2: 25/9/2020

LESSON PLAN

Unit : IV From 05/10/2020 To 14/10/2020 No. of Hours : 09

Unit-IV: INVERTER

Target Period: 9 Planned Periods: 12

.NO	Topics to be Covered	Course Outcome	Hours Required	Text/Reference Book	Teaching Aid	Knowledge Level
1.	Design and analysis of single phase square wave voltage source inverter	C303.4	1	P.S.Bimbra "Power Electronics" M.H.Rashid, "Power Electronics"	PPT	R,U,An,
2.	Design and analysis of Three phase voltage source inverter in 120 degree conduction		2		PPT	R,U,An,A
3.	Design and analysis of Three phase voltage source inverter in 180 degree conduction		1		PPT	R,U,An,A
4.	Voltage control and Harmonics elimination by Single pulse and Multi pulse PWM technique		2		Black Board	R,U,An,
5.	Voltage control and Harmonics elimination by Sinusoidal PWM technique		1		Black Board	R,U,An,
6.	Voltage control and Harmonics elimination by Space vector modulation method		1		Black Board	R,U,An,
7.	Introduction to current source inverter and analysis of Auto sequential commutate current source inverter		1		PPT	R,U,An,
8.	Comparison of current source inverter with voltage source inverter.		1		Black Board	R,U
9.	Applications-Induction heating, UPS.		1		Black Board	U,An
10.	Tutorial		1		Black Board	R,U,An,

Assignment submission: — Seminar/Tutorial: Induction Heating & UPS - 14/10/2020 Internal Assessment 4: —

UNIT : V FROM : 15/10/2020 TO 30/10/2020 No. of Hours: 09

Unit-V: AC TO AC CONVERTERS

Target Period: 9 Planned Periods:12

S.NO	Topics to be Covered	Course Outcome	Hours Required	Text/Reference Book	Teaching Aid	Knowledge Level
1.	Introduction to single phase Ac to Ac voltage converter.	C303.5	1	P.S.Bimbra "Power Electronics" M.H.Rashid, "Power Electronics"	Power Point Presentation	R,U,An,
2.	ON- OFF and phase control methodology for AC to AC voltage converter		2		Power Point Presentation	R,U,An,
3.	Single stage sequence control methodology for AC to AC voltage converter		1		Black Board	R,U,A,An
4.	Multi stage sequence control methodology for AC to AC voltage converter		1		Black Board	R,U,An,
5.	Introduction to single phase cyclo converter		2		Black Board	R,U,An,
6.	Introduction to Three phase cyclo converter		1		Black Board	R,U,An,
7.	Analysis of three phase to single phase cyclo converter		1		Power Point Presentation	R,U,An,
8.	Analysis and working of Matrix converter		1		Black Board	R,U,An,
9.	Applications –welding		1		Black Board	U,An
10.	Tutorial		1		Black Board	R,U,An,

Assignment submission: — Seminar/Tutorial: — Model Exam: 4/11/2020

Web source Reference

S.No	UNIT	TOPIC	Ref / Link
1	2	Single phase fully controlled rectifier	NPTEL
2	3	Operation buck converter	NPTEL

Self Study topics

S.No	UNIT	TOPIC	Text / Ref book
1	1	V-I characteristics of Power diode.	T1/R4
2	2	Compare the half controlled rectifier with fully controlled rectifier	T1/R4

STAFF SIGNATURE HOD SIGNATURE PRINCIPAL

LESSON PLAN

Unit : III From 17/9/2020 To 2/10/2020 No. of Hours : 09

Unit-III: DC TO DC CONVERTER

Target Period: 9 Planned Periods: 12

S.NO	Topics to be Covered	Course Outcome	Hours Required	Text/Reference Book	Teaching Aid	Knowledge Level
1.	Design and analysis of step down chopper	C303.3	1	P.S.Bimbra "Power Electronics" M.H.Rashid, "Power Electronics"	PPT	R,U,An,
2.	Design and analysis of step Up chopper		1		Black Board	R,U,An,
3.	Introduction to types of choppers-A, B, C, D and E		1		PPT	R,U,An,
4.	Analysis of Buck converter.		2		PPT	R,U,An,A
5.	Analysis of Boost converter.		1		Black Board	R,U,A,An
6.	Analysis of Buck –Boost converter.		1		Black Board	R,U,An,A
7.	Time ratio control and current limiting control for chopper		1		PPT	R,U,An,
8.	Analysis Of Forced Commutated chopper and voltage commutated chopper		1		Black Board	R,U,An,
9.	Design and analysis of Resonant Converter		1		Black Board	R,U,An,
10.	Applications-Battery operated vehicles.		1		Black Board	U,An,
11.	Tutorial		1		Black Board	R,U,An,

Assignment submission: 7/10/2020 Seminar/Tutorial: 2/10/2020 Application - Battery Operated Vehicles Internal Assessment 3: 21/10/2020

DAILY RECORD OF CLASS WORK

Month & Year : Aug & Sept 2020

Date*	Day	Allotted Period	Period Handled	Reason for Alteration
	Monday			
	Tuesday			
12/8/2020	Wednesday	S1	–	Orientation Program.
13/8/2020	Thursday	S3	S3	
14/8/2020	Friday	–	–	
15/8/2020	Saturday	–	–	
17/8/2020	Monday	S1	S1	
18/8/2020	Tuesday	S3	S3	
19/8/2020	Wednesday	S1	S1	
20/8/2020	Thursday	S3	S3	
21/8/2020	Friday	–	–	
22/8/2020	Saturday	–	–	
24/8/2020	Monday	S2	S2	
25/8/2020	Tuesday	S4	S4	
26/8/2020	Wednesday	S1	S1	
27/8/2020	Thursday	S4	S4	
28/8/2020	Friday	–	–	
29/8/2020	Saturday	–	–	

31/8/2020	Monday	S1	–	Unit Test - 1.
01/09/2020	Tuesday	S3	S3	
02/09/2020	Wednesday	S1	–	Unit Test - 1
03/09/2020	Thursday	S3	S3	
04/09/2020	Friday	–	–	
05/09/2020	Saturday	–	–	
07/09/2020	Monday	S1	S1	
08/09/2020	Tuesday	S3	S3	
09/09/2020	Wednesday	S1	S1	
10/09/2020	Thursday	S3	S3	
11/09/2020	Friday	–	–	
12/09/2020	Saturday	–	–	
14/09/2020	Monday	S1	S1	
15/09/2020	Tuesday	S3	S3	
16/09/2020	Wednesday	S1	S1	
17/09/2020	Thursday	S3	S3	
18/09/2020	Friday	–	–	
19/09/2020	Saturday	–	3 & 4	To Complete syllabus.

* Holidays / CL and OD days to be mentioned against the corresponding dates

Signature of HOD :

ATTENDANCE

Roll No.	Reg.No.	Name	No. of Periods Attended / Report Period 1	2	3	4	08	08	08	08	08	08	08	08	08	08	09	09	09
						DATE	13	17	18	19	20	24	25	26	27	01	03	04	08
IBEE	312318105					PERIOD	S3	S1	S3	S1	S3	S2	S4	S1	S4	S3	S3	S1	S3
708	063	Varalakshmi J V V S					1	1	1	1	1	1	1	1	1	1	1	1	1
122	111	Ramesh S M					1	1	1	1	1	1	1	1	1	1	1	1	1
126	112	Ram Karthick. K.					1	1	1	1	1	1	1	1	1	1	1	1	1
214	113	Ramkumar. S					1	1	1	1	1	1	1	1	1	1	1	1	1
146	114	Refayee Farith. K					1	1	1	1	1	1	1	1	1	1	1	1	1
256	115	Reshma. K					1	1	1	1	1	1	1	1	1	1	A	1	1
110	116	Revanth. k. S					1	1	1	1	1	1	1	1	1	1	1	1	1
120	117	Ricky John. P					1	1	1	1	1	1	1	1	1	1	1	1	1
115	118	Rishi kumar. B					1	1	1	1	1	1	1	1	1	1	1	1	1
221	119	Rojith. K.					1	1	1	1	1	1	1	1	1	1	1	1	1
201	120	Rohanraj. R					1	1	1	1	1	1	1	1	1	1	1	1	1
132	122	Rohit Sudhan. P					1	1	1	1	1	1	1	1	1	1	1	1	1
105	124	Rosario Sridish. M					1	1	1	1	1	1	1	1	1	1	1	1	1
279	125	Roshan. k.					1	1	1	1	1	1	1	1	1	1	1	1	1
251	126	Sam. B Sac					1	1	1	1	1	1	1	1	1	1	1	1	1
220	127	Santhosh Raj. P					1	1	1	1	1	1	1	1	1	1	1	1	1
206	128	Saranarayanan. S					1	1	1	1	1	1	1	1	1	1	1	1	1
241	129	Sarikumar. B					1	1	1	1	1	1	1	1	1	1	1	1	1
218	130	Sathiya. S					1	1	1	1	1	1	1	1	1	1	1	1	1
118	131	Sebastian Sugan. G					1	1	1	1	1	1	1	1	1	1	1	1	1
211	132	Sharan. R					1	1	1	1	1	1	1	1	1	1	1	1	1
219	133	Shree pranav. S					1	1	1	1	1	1	1	1	1	1	1	1	1
240	134	Sivabalan. M					1	1	1	1	1	1	1	1	1	1	1	1	1
116	135	Siva Sankar. V					1	1	1	1	1	1	1	1	1	1	1	1	1
222	136	Siva Subramanian. S					1	1	1	1	1	1	1	1	1	1	1	1	1
						Total ABSENT	-	-	-	-	-	-	-	-	-	-	1	-	-
						Total PRESENT	25	25	25	25	25	25	25	25	25	25	24	25	25

Roll No.	Reg.No.	09 / 09 / S1	09 / 10 / S3	09 / 14 / S1	09 / 15 / S3	09 / 16 / S1	09 / 17 / S3	09 / 21 / S1	09 / 22 / S3	09 / 24 / S3	09 / 25 / S3	9 / 29 / S3	9 / 30 / S1	10 / 01 / S3
18EE	312318105													
703	063	1	1	1	1	1	1	1	1	1	1	1	1	1
122	111	1	1	1	1	1	1	1	1	1	1	1	1	1
126	112	1	1	1	1	1	1	1	1	1	1	1	1	1
214	113	1	1	1	1	1	1	1	1	1	1	1	1	1
146	114	1	1	1	1	1	1	1	1	1	1	1	1	1
256	115	1	1	1	1	1	1	1	1	1	1	1	1	1
110	116	1	1	1	1	1	1	1	1	1	1	1	1	1
120	117	1	1	a	1	1	1	1	1	1	1	1	1	1
115	118	1	1	1	1	1	1	1	1	1	1	1	1	1
221	119	1	1	1	1	1	1	1	1	1	1	1	1	1
201	120	1	1	1	1	1	1	1	1	1	1	1	1	1
132	122	1	1	1	1	1	1	1	1	1	1	1	1	1
105	124	1	1	1	1	1	1	1	1	1	1	1	1	1
279	125	1	1	1	1	1	1	1	1	1	1	1	1	1
251	126	1	1	1	1	1	1	1	1	1	1	1	1	1
220	127	1	1	1	1	1	1	1	1	1	1	1	1	1
206	128	1	1	1	1	1	1	1	1	1	1	1	1	1
241	129	1	1	1	1	1	1	1	1	1	1	1	1	1
218	130	1	1	1	1	1	1	1	1	1	1	1	1	1
118	131	1	1	1	1	1	1	1	1	1	1	1	1	1
211	132	1	1	1	1	1	1	1	1	1	1	1	1	1
219	133	1	1	1	1	1	1	1	1	1	1	1	1	1
240	134	1	1	1	1	1	1	1	1	1	1	1	1	1
116	135	1	1	1	1	1	1	1	1	1	1	1	1	1
222	136	1	1	1	1	1	1	1	1	1	1	1	1	1
Total ABSENT		1	-	01	-	-	-	-	-	-	-	-	-	-
Total PRESENT		25	25	24	25	25	25	25	25	25	25	25	25	25

MONTH / DATE / PERIOD

Roll No.	10 / 02 / S3	10 / 05 / S1	10 / 06 / S3	10 / 07 / S1	10 / 08 / S3	10 / 09 / S3	10 / 10 / S2	10 / 12 / S1	10 / 13 / S3	10 / 14 / S1	10 / 15 / S3	10 / 17 / S2	10 / 20 / S3
703	1	1	1	1	1	1	1	1	1	1	1	1	1
122	1	1	1	1	1	1	1	1	1	1	1	1	1
126	1	1	1	1	1	1	1	1	1	1	1	1	1
214	1	1	1	1	1	1	1	1	1	1	1	1	1
146	1	1	1	1	1	1	1	1	1	1	1	1	1
256	1	1	1	1	1	1	1	1	1	1	1	1	1
110	1	1	1	1	1	1	1	1	1	1	1	1	1
120	1	1	1	1	1	1	1	1	1	1	1	1	1
115	1	1	1	1	1	1	1	a	1	1	1	1	1
221	1	1	1	1	1	1	1	1	1	1	1	1	1
201	1	1	1	1	1	1	1	1	1	1	1	1	1
132	1	1	1	1	1	1	1	1	1	1	1	1	1
105	1	1	1	1	1	1	1	1	1	1	1	1	1
279	1	1	1	a	1	1	1	1	1	1	1	a	1
251	1	1	1	1	1	1	1	1	1	1	1	1	1
220	1	1	1	1	1	1	1	1	1	1	1	1	1
206	1	1	1	1	1	1	1	1	1	1	1	1	1
241	1	1	1	1	1	1	1	1	1	1	1	1	1
218	1	1	1	1	1	1	1	1	1	1	1	1	1
118	1	1	1	1	1	1	1	1	1	1	1	1	1
211	1	1	1	1	1	1	1	1	1	1	1	1	1
219	1	1	1	1	1	a	1	1	1	1	1	1	1
240	1	1	1	1	1	1	1	1	1	1	1	1	1
116	1	1	1	1	1	1	1	1	1	1	1	1	1
222	1	1	1	1	1	1	1	1	1	1	1	1	1
Total ABSENT	-	-	-	1	-	1	-	1	-	-	-	1	-
Total PRESENT	25	25	25	24	25	24	25	24	25	25	25	24	25

Roll No.	Reg.No.		MONTH	10	10	10	10	10	10
			DATE	22	26	27	28	29	30
			PERIOD	47	51	53	51	53	52
18EE	312318105								
703	063	Va		1	1	1	1	1	1
122	111	Rc		1	1	1	1	1	1
126	112	Ro		1	1	1	1	1	1
214	113	R		1	1	1	1	1	1
146	114	R		1	1	1	1	1	1
256	115			1	1	1	1	1	1
110	116			1	1	1	1	1	1
120	117			1	1	1	1	1	1
115	118			1	1	1	1	1	1
221	119			1	1	1	1	1	1
201	120			1	1	1	1	1	1
132	122			1	1	1	1	1	1
105	124			a	1	1	1	1	1
279	125			1	1	1	1	1	1
251	126			1	1	1	1	a	1
220	127			1	1	1	1	1	1
206	128			1	1	1	1	1	1
241	129			1	1	1	1	1	1
218	130			1	1	1	1	1	1
118	131			1	1	1	1	1	1
211	132			1	1	1	1	1	1
219	133			1	1	1	1	1	1
240	134			1	1	1	1	1	1
116	135			1	1	1	1	1	1
222	136			1	1	1	1	1	1
			Total ABSENT	1	-	-	-	1	-
			Total PRESENT	24	25	25	25	24	25

Roll No.	Reg.No.	
IBEE	312318105	
703	063	V
122	111	
126	112	
214	113	
146	114	
256	115	
110	116	
120	117	
115	118	
281	119	
201	120	
132	122	
105	124	
279	125	
251	126	
220	127	
206	128	
241	129	
218	130	
118	131	
211	132	
219	133	
240	134	
116	135	
222	136	

MONTH

DATE

PERIOD

Total ABSENT

Total PRESENT

CONTINUOUS ASSESSMENT MARKS

ASSESSMENT TYPE	IAE 1		IAE 2		Quiz-1		IAE-3		Model	Quiz-2	
DATE	2/9		25/9		6/10		21/10		4/11	4/11	
25			40		23		35		98	76	
36			45		20		35		92	92	
28			39		20		34		90	96	
49			44		23		37		100	96	
46			45		24		29		86	82	
38			44		23		34		98	90	
35			39		22		36		100	96	
25			36		20		29		82	92	
34			30		23		34		80	94	
49			39		24		42		96	90	
44			38		17		34		86	90	
41			39		23		35		100	94	
34			35		23		25		92	96	
37			35		11		27		98	92	
35			43		22		35		92	96	
44			42		21		34		90	96	
44			38		24		34		100	80	
42			39		21		43		98	96	
35			42		24		42		92	94	
48			41		23		41		100	98	
48			49		23		35		88	92	
44			45		19		38		100	90	
35			37		24		34		86	84	
43			48		23		34		98	96	
40			46		23		34		100	96	

ATTENDANCE

Roll No.	Reg.No.	Name	No. of Periods Attended – Report Period 1	2	3	4														
		MONTH					08	08	08	08	08	08	08	08	08	09	09	09	09
		DATE					13	17	18	19	20	24	25	26	27	01	03	07	08
		PERIOD					33	31	33	31	33	32	29	31	34	33	33	31	33
136	137	Smirutha. T. A.					1	1	1	1	1	1	1	1	1	1	1	1	1
114	138	Sonali V. M					1	1	1	1	1	1	1	1	1	1	1	1	1
273	139	Sribalaji. S					1	1	1	1	1	1	1	1	1	1	1	1	1
157	140	Sriram. A.					1	1	1	1	1	1	1	1	1	1	1	1	1
207	142	Surendhran. V					1	1	1	1	1	1	1	1	1	1	1	1	1
257	143	Suriyapriyan. R					1	1	1	1	1	1	1	1	1	1	1	1	1
294	144	Surithi kariya. S					1	1	1	1	1	1	1	1	1	1	1	1	1
133	145	Swetha. M					1	1	1	1	1	1	1	1	1	1	1	1	1
124	146	Theerthana. S					1	1	1	1	1	1	1	1	1	1	1	1	1
215	147	Thirukameshwaran. K.					1	1	1	1	1	1	1	1	1	1	1	1	1
253	148	Thirumurugan. S					1	1	1	1	1	1	1	1	1	1	1	1	1
268	149	Umabharathi. S					1	1	1	1	1	1	1	1	1	1	1	1	1
106	150	Varatharajan. B					1	1	1	1	1	1	1	1	1	1	1	1	1
141	151	Vedhanayaki. V. R					1	1	1	1	1	1	1	1	1	1	1	1	1
165	152	Veeramani. K.					1	1	1	1	1	1	1	1	1	1	1	1	1
158	153	Velan. M					1	1	1	1	1	1	1	1	1	1	1	1	1
140	154	Vignesh. A					1	1	1	1	1	1	1	1	1	1	1	1	1
144	155	Vignesh. R					1	1	1	1	1	1	1	1	1	1	1	1	1
237	156	Vijaya Varshini. K.					1	1	1	1	1	1	1	1	1	1	1	1	1
210	157	Vishak. K. S					1	1	1	1	1	1	1	1	1	1	1	1	1
151	158	Yuhwantha. M					1	1	1	1	1	1	1	1	1	1	1	1	1
247	159	Yuvaraj. M					1	1	1	1	1	1	1	1	1	1	1	1	1
403	301	Dinesh. A.					1	1	1	1	1	A	A	A	A	A	A	A	A
504	303	Kameshwaran.					1	1	1	1	1	1	1	1	1	1	1	A	1
402	304	Ligesh. R.					1	1	1	1	1	1	1	1	1	1	1	1	1
		Total ABSENT					–	–	–	–	–	1	1	1	1	1	1	2	1
		Total PRESENT					25	25	25	25	25	24	24	24	24	24	24	23	24

Roll No.	Reg.No.
136	137
114	138
273	139
157	140
207	142
257	143
294	144
133	145
124	146
215	147
253	148
268	149
106	150
141	151
165	152
158	153
140	154
144	155
237	156
210	157
751	158
247	159
403	301
504	303
402	304

MONTH	09	09	09	09	09	09	09	09	09	09	09	09	10
DATE	09	10	14	15	16	17	21	22	24	25	29	30	01
PERIOD	S1	S3	S1	S3	S1	S3	S1	S3	S3	S3	S3	S1	S3
Total ABSENT	2	2	2	2	2	2	2	2	2	2	2	2	2
Total PRESENT	25	25	25	25	25	25	25	25	25	25	25	25	25

MONTH	10	10	10	10	10	10	10	10	10	10	10	10	10
DATE	02	05	06	07	08	09	10	12	13	14	15	17	20
PERIOD	S3	S1	S3	S1	S3	S3	S2	S1	S3	S1	S3	S2	S3
Total ABSENT	1	2	1	1	1	2	2	2	1	2	2	1	2
Total PRESENT	24	25	24	24	24	25	25	25	24	25	25	24	25

Roll No.	Reg.No.	
136	137	
114	138	
273	139	
157	140	
207	142	
257	143	
294	144	
133	145	
124	146	
215	147	
253	148	
268	149	
106	150	
141	151	
165	152	
158	153	
140	154	
144	155	
237	156	
210	157	
751	158	
247	159	
403	301	
504	303	
402	304	

MONTH	10	10	10	10	10	10
DATE	22	26	27	28	29	30
PERIOD	33	31	33	31	33	32
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	a	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	a
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	a	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
/ /	1	1	1	1	1	1
Total ABSENT	-	-	1	1	-	1
Total PRESENT	25	25	24	24	25	24

Roll No.	Reg.No.
136	137
114	138
273	139
157	140
207	142
257	143
294	144
133	145
124	146
215	147
253	148
268	149
106	150
141	151
165	152
158	153
140	154
144	155
237	156
210	157
751	158
247	159
403	301
504	303
402	304

MONTH

DATE

PERIOD

Total ABSENT

Total PRESENT

CONTINUOUS ASSESSMENT MARKS

ASSESSMENT TYPE		TAE 1		TAE 2		Quiz		TAE 3		Model	Quiz	
DATE		02/09		25/9		6/10		21/10		4/11	4/11	
		36		39		23		36		86	94	
		34		42		23		34		96	96	
		35		36		25		46		100	82	
		39		36		20		34		92	78	
		40		42		21		37		96	96	
		41		39		19		37		98	96	
		41		44		23		29		100	96	
		42		39		24		35		97	92	
		42		36		17		29		84	86	
		43		38		21		36		90	94	
		35		39		22		36		100	96	
		37		37		25		36		98	98	
		35		39		23		37		100	98	
		47		39		23		35		90	80	
		38		39		20		41		86	92	
		44		43		23		38		100	94	
		37		42		21		35		80	90	
		35		39		22		35		100	94	
		47		46		24		35		96	96	
		46		42		23		39		100	92	
		45		37		24		39		100	72	
		49		38		21		47		100	98	
		AB	37	44		21		36		100	92	
		40		36		25		27		90	96	
		48		40		18		35		98	94	

ATTENDANCE

Roll No.	Reg.No.	Name	No. of Periods Attended – Report Period 1	2	3	4
401	305	Logesh Kannan. R				
501	306	Saran Kumar. N.				

MONTH	08	08	08	08	08	08	08	08	09	09	09	09	09
DATE	13	17	18	19	20	24	25	26	31	03	03	07	08
PERIOD	S3	S1	S3	S1	S3	S2	S1	S4	S4	S3	S3	S1	S3
	1	A	A	1	1	1	1	1	1	1	A	1	1
	1	1	1	1	1	1	1	1	1	1	1	1	1
Total ABSENT	–	1	1	–	–	–	–	–	–	–	1	–	–
Total PRESENT	2	1	1	2	2	2	2	2	2	2	1	2	2

SUMMARY OF CLASS WORK

DATE: 13/8/2020 PERIOD: S3 TOTAL NO. OF CLASS 01 UNIT: I

Introduction to power Electronics system – Advantages & Disadvantages of PES – Applications.

Power Semiconductor devices – Introduction & its types.

DATE: 17/8/2020 PERIOD: S1 TOTAL NO. OF CLASS 02 UNIT: I

SCR – Symbol, Modes of Operation, VI & switching characteristics Turn-on Methods & Two-transistor analogy, Advantages & Disadvantages & Applications.

DATE: 18/8/2020 PERIOD: S3 TOTAL NO. OF CLASS 03 UNIT: I

TRIAC – Symbol, VI characteristics and Modes of Operation – Applications.

SUMMARY OF CLASS WORK

DATE: 19/8/2020 PERIOD: S1 TOTAL NO. OF CLASS 04 UNIT: I

BJT - Symbol, Operation, VI characteristics - Switching charac. Transistor as a switch - Operating region, Advantages & disadvantages - Applications.

DATE: 20/8/2020 PERIOD: S3 TOTAL NO. OF CLASS 05 UNIT: I

MOSFET - Symbol, Operation, Types - Enchannel Types & Depletion modes - VI characteristics : Transfer & Drain characteristics Switching characteristics : Turn-On & Turn-off characteristics.

DATE: 24/8/2020 PERIOD: S2 TOTAL NO. OF CLASS 06 UNIT: I

IGBT - Symbol, Operation, VI characteristics:- Transfer & collector Characteristics - Switching Characteristics - Turn-ON & Turn-OFF Characteristics.

Seminar on Constructional details of IGBT.

Sign of HOD with Date

SUMMARY OF CLASS WORK

DATE: 25/8/2020 PERIOD: 84 TOTAL NO. OF CLASS 07 UNIT: I

GTO - Symbol, Operations, VI characteristics & Switching charac.

IGCT - Symbol, Operations, VI characteristics & switching characteristics & Applications.

DATE: 26/8/2020 PERIOD: 81 TOTAL NO. OF CLASS 08 UNIT: I

Triggering circuits - R, RC & UJT Triggering circuits.
Commutation circuits - Introduction & its Types.
Class A, class B & class C Commutation - circuit diagram & its waveforms.

DATE: 27/8/2020 PERIOD: 84 TOTAL NO. OF CLASS 09 UNIT: I

class D Commutation circuits - Introduction & its waveforms
class E Commutation - Natural commutation.
Introduction to Driver circuits & Snubber circuits.

SUMMARY OF CLASS WORK

DATE: 01/09/2020 PERIOD: 33 TOTAL NO. OF CLASS 01 UNIT: II

Introduction to phase-controlled Rectifiers – Applications Single phase Half-wave Rectifier (one pulse converter) – Operations with R, RL, RL with FWD and RLE load. Expression for average o/p voltage.

DATE: 03/09/2020 PERIOD: 33 TOTAL NO. OF CLASS 02 UNIT: II

Two pulse Converter – 1ϕ full wave converter (mid point & Bridge-type Configuration) – Operations with R, RL and RLE loads – Expression for o/p Voltage – performance parameters of 1ϕ full wave Converter.

DATE: 07/09/2020 PERIOD: 31 TOTAL NO. OF CLASS 03 UNIT: II

Single phase semiconverter – Symmetrical & Assymmetrical Configuration. Circuit diagram, waveforms & Expression for average & rms value of o/p voltages.

Sign of HOD with Date

SUMMARY OF CLASS WORK

DATE: 08/09/2020 PERIOD: S3 TOTAL NO. OF CLASS 04 UNIT: II

Three Phase Half-wave Converter (3 pulse Converter) - Operation with RL & RLE load - Circuit diagram & its waveforms. Expression for output voltage.

DATE: 09/09/2020 PERIOD: S1 TOTAL NO. OF CLASS 05 UNIT: II

Three phase Semiconverter - Operation with RL load, RL with FWD and RLE load - Expression for output voltage.

DATE: 10/09/2020 PERIOD: S3 TOTAL NO. OF CLASS 06 UNIT: II

Three phase full Converter (Six pulse Converter) - Operation with R, RL load & RLE load - Expression for o/p voltage - Performance parameters of 3ϕ Converter.

SUMMARY OF CLASS WORK

DATE: 14/09/2020 PERIOD: 81 TOTAL NO. OF CLASS 07 UNIT: II

Effect of Source Impedance on 1φ full Converter & 3φ full Converter - Expression of average o/p voltage.

DATE: 15/09/2020 PERIOD: 83 TOTAL NO. OF CLASS 08 UNIT: II

Dual Converter - Types - Non-circulating & Circulating Types dual Converter - Operations & waveforms.

DATE: 16/09/2020 PERIOD: 81 TOTAL NO. OF CLASS 09 UNIT: II

Applications - Light Dimmers -, circuit diagram & Operation. Excitation System - Ac, Dc & static Excitation Systems. Solar pv system - Stand alone & Grid-Connected System.

Sign of HOD with Date

SUMMARY OF CLASS WORK

DATE: 28/10/20 PERIOD: 81 TOTAL NO. OF CLASS 7 UNIT: V

Matrix Converter - Circuit diagram - Operations - Advantages & disadvantages

DATE: 29/10/20 PERIOD: 83 TOTAL NO. OF CLASS 8 UNIT: V

Applications - Welding - Types & its uses.

DATE: 30/10/20 PERIOD: 82 TOTAL NO. OF CLASS 9 UNIT: V

Tutorial - problems On single phase & three phase ac Voltage Controller.

SUMMARY OF CLASS WORK

DATE: PERIOD: TOTAL NO. OF CLASS UNIT:

DATE: PERIOD: TOTAL NO. OF CLASS UNIT:

DATE: PERIOD: TOTAL NO. OF CLASS UNIT:

Sign of HOD with Date

RESULT ANALYSIS

TERM - I

S.No	Description		IAE - I	IAE - II
1	Date of Exam	:	02/09/2020	25/9/2020
2	Total No. of Students	:	52	52
3	No of Students Attended	:	50	52
4	No of Students Passed	:	50	51
5	Percentage of Pass	:	100%.	98.07%.
Signature of the Staff		:	Vedavalli.S.P	Vedavalli.S.P
Name of the Staff		:	S.P. Vedavalli.	S.P. Vedavalli
Signature of the HOD of the Concerned Department with Date (After distributing the answer scripts)		:	8/11	8/11

Range of Marks		AB	0 - 22	23 - 30	31 - 35	36 - 40	41 - 45	46 - 50
No. of Students	IAE - I	02	—	4	11	11	14	10
	IAE - II	00	0	1	2	29	16	4

Range of Marks	0 - 44	45 - 60	61 - 70	71 - 80	81 - 90	91 - 100
No. of Students (IAE I & II Combined)	2	0	6	19	20	5

Signature of the HOD of the Concerned Department : 8/11

RESULT ANALYSIS

TERM - II

S.No	Description		IAE - III	IAE - IV
1	Date of Exam	:	21/10/2020	
2	Total No. of Students	:	52	
3	No of Students Attended	:	52	
4	No of Students Passed	:	52	
5	Percentage of Pass	:	100%.	
Signature of the Staff		:	Vedavalli.S.P	
Name of the Staff		:	S.P. Vedavalli.	
Signature of the HOD of the Concerned Department with Date (After distributing the answer scripts)		:	8/11	

Range of Marks		AB	0 - 22	23 - 30	31 - 35	36 - 40	41 - 45	46 - 50
No. of Students	IAE - III	0	0	8	23	14	5	2
	IAE - IV	—	—	—	—	—	—	—

Range of Marks	0 - 44	45 - 60	61 - 70	71 - 80	81 - 90	91 - 100
No. of Students (IAE III & IV Combined)	—	—	—	—	—	—

Signature of the HOD of the Concerned Department : 8/11

RESULT ANALYSIS

MODEL EXAMINATION

1 Date of Exam : 4/11/2020

2 Total No. of Students : 52

3 No of Students Attended : 52

4 No of Students Passed : 52

5 Percentage of Pass : 100 %.

RESULT ANALYSIS

Range of Marks	0-44 (0-66)	45-60 (68-90)	61-70 (92-105)	71-80 (106-120)	81-90 (122-135)	91-100 (137-150)
No. of Students	0	0	1	0	15	36

Signature of the Staff : [signature]

Name of the Staff : S. P. Vedavalli.

Signature of the HOD of the Concerned Department with Date (After distributing the answer scripts) : [signature]

SYLLABUS COVERAGE

Unit No.	Started on	Completed on	No. of hours	Sign of staff with Date	Sign of HOD with Date
I	12/8/2020	27/8/2020	09	Vedavalli.S.P 27/8/2020	[signature]
II	01/09/2020	16/09/2020	09	Vedavalli.S.P 16/9/2020	[signature]
III	17/09/2020	02/10/2020	09	Vedavalli.S.P 2/10/2020	[signature]
IV	05/10/2020	14/10/2020	09	Vedavalli.S.P 14/10/2020	[signature]
V	15/10/2020	30/10/2020	09	Vedavalli.S.P 30/10/20	[signature]
Content Beyond syllabus: 1) UNIT - I - SCR protection - 20/8/2020					[signature]
2) UNIT - IV - Multilevel Inverter - 12/10/2020 3) UNIT - II - conducted Workshop on Solar power Technologies - 11/08/2020					[signature]

REMARKS

S.No.	Date	Remarks/Comments/Deviations, if any	HOD Signature with Date
01.	3dec2020	Conducted Special classes on 02/10/2020, 10/10/2020, 16/10/2020 & 31/10/2020 to Complete syllabus in Unit 3, 4 & 5.	

St. JOSEPH'S COLLEGE OF ENGINEERING

St. Joseph's Group of Institutions
OMR, Chennai - 119
Department of Electrical and Electronics Engineering

EE8552 POWER ELECTRONICS
MODEL EXAM
ANSWER ALL QUESTIONS
PART-A **(50*2=100 Marks)**

1. List the different methods to turn on SCR.
2. Define threshold voltage of power MOSFET.
3. Mention the advantages of GTO over SCR.
4. Mention the merits and demerits of GTO.
5. How is di/dt and dv/dt protection provided in SCR?
6. Mention the advantages of 'RC' triggering over 'R' triggering.
7. What is meant by commutation of a SCR and list its types.
8. Compare MOSFET and BJT.
9. What is the use of snubber circuit?
10. Define pinch off voltage of MOSFET.
11. Write the relation between firing angle and extinction angle in single phase fully controlled rectifier when operating with RL load.
12. Classify the different types of controlled rectifier.
13. What is the function of freewheeling diode and state its advantages?
14. What is meant by phase control?
15. Mention the disadvantages of dual converter with circulating current mode of operation?
16. Why is power factor of semi converter better than full converter?
17. Mention the effect of source inductance in converters.
18. Define the input power factor.
19. What is the difference between symmetric and asymmetric semiconductor configuration?
20. What is firing angle and overlap angle?
21. What is meant by time ratio/ duty cycle or PWM control (duty cycle) of a DC chopper?
22. What is the effect of load inductance on the load current waveforms in the case of DC chopper?
23. What is constant frequency control of chopper?
24. What are the disadvantages of frequency modulated chopper?
25. Distinguish between time ratio control and current limit control employed in a DC chopper.

St. JOSEPH'S COLLEGE OF ENGINEERING

St. Joseph's Group of Institutions
OMR, Chennai - 119
Department of Electrical and Electronics Engineering

EE8552 POWER ELECTRONICS

Internal Assessment Exam III

ANSWER ALL QUESTIONS

Multiple choice questions(10*1 =10Marks)

1. In a VSI (Voltage source inverter)
   a) the internal impedance of the DC source is negligible
   b) the internal impedance of the DC source is very very high
   c) the internal impedance of the AC source is negligible
   d) the IGBTs are fired at 0 degrees.
2. VSIs using GTOs are turned off by
   a)loadcommutation
   b) line commutation
   c) applying a negative gate pulse
   d) removing the base signal
3. The voltage in a single phase half wave inverter varies between
   a) Vs and 0
   b) Vs/2 and 0
   c) Vs/2 and –Vs/2
   d) Vs and –Vs
4. A single phase half bridge inverter has load R = 2 Ω and a dc voltage source Vs/2 = 115 V. Find the power delivered to the load due to the fundamental component.
   a) 536 kW
   b) 53.61 kW
   c) 5.361 kW
   d) 536 W
5. _____ is the measure of the contribution of any individual harmonic to the inverter output voltage.
   a) THD
   b) Distortion Factor
   c) Harmonic Factor
   d) TUF
6. A single phase inverter gives rms value of output voltage as 115 V and the fundamental output voltage of as 103.5 V. Find the THD (Total Harmonic Distortion)
   a) 0.4 %
   b) 40.8 %
   c) 48.3 %
   d) 4.83 %
7. In sinusoidal pulse width modulation, the comparator output is high when the
   a) triangular wave has magnitude higher than the sinusoidal wave
   b) sinusoidal wave has magnitude higher than the triangular wave
   c) triangular wave has magnitude equal to the sinusoidal wave
   d) none of the mentioned
8. Which type of chopper is used in the regenerative braking of DC motors?
   a) type A
   b) type B
   c) type C
   d) type D
9. For a type D chopper, the average value of output voltage will be positive when
   a) Ton = Toff
   b) Ton < Toff
   c) Toff = 0
   d) Ton > Toff
10. What is the expression for load voltage when the chopper is operated in the second quadrant?
    a) Vs
    b) E
    c) 0
    d) E + Ldi/dt

St. JOSEPH'S COLLEGE OF ENGINEERING

St. Joseph's Group of Institutions
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Department of Electrical and Electronics Engineering
EE8552 POWER ELECTRONICS

CLASS TEST 1

ANSWER ALL QUESTIONS

Multiple choice questions(10*1 =10Marks)

1. A power transistor is a _____ device.
a) two terminal, bipolar, voltage controlled
b) two terminal, unipolar, current controlled
c) three terminal, unipolar, voltage controlled
d) three terminal, bipolar, current controlled

2. A power BJT is used as a power control switch by biasing it in the cut off region (off state) or in the saturation region (on state). In the on state
a) both the base-emitter & base-collector junctions are forward biased
b) the base-emitter junction is reverse biased, and the base collector junction is forward biased
c) the base-emitter junction is forward biased, and the base collector junction is reversed biased
d) both the base-collector & the base-emitter junctions are reversed biased

3.At turn-on the initial delay or turn on delay is the time required for the
a) input inductance to charge to the threshold value
b) input capacitance to charge to the threshold value
c) input inductance to discharge to the threshold value
d) input capacitance to discharge to the threshold value

4.Choose the correct statement(s)
i) The gate circuit impedance of MOSFET is higher than that of a BJT
ii) The gate circuit impedance of MOSFET is lower than that of a BJT
iii) The MOSFET has higher switching losses than that of a BJT
iv) The MOSFET has lower switching losses than that of a BJT
a) Both i& ii
b) Both ii & iv
c) Both i& iv
d) Only ii

5.The structure of the IGBT is a
a) P-N-P structure connected by a MOS gate
b) N-N-P-P structure connected by a MOS gate
c) P-N-P-N structure connected by a MOS gate
d) N-P-N-P structure connected by a MOS gate

6.An IGBT is also known as
a) MOIGT (Metal oxide insulated gate transistor)
b) COMFET (Conductively modulated FET)
c) GEMFET (Grain modulated FET)
d) all of the mentioned

7.A thyristor can be bought from the forward conduction mode to forward blocking mode by
a) the dv/dt triggering method
b) applying a negative gate signal
c) applying a positive gate signal
d) applying a reverse voltage across anode-cathode terminals

8.During the transition time or turn-on time
a) The forward anode voltage decreases from 90 % to 10 % & the anode current also decreases from 90 to 10 % of the initial value
b) The forward anode voltage increases from 10 % to 90 % & the anode current also increases from 10 % to 90 % of the initial value
c) The forward anode voltage decreases from 90 % to 10 % & the anode current increases from 10 % to 90 % of the initial value
d) The forward anode voltage increases from 10 % to 90 % & the anode current decreases from 90% to 10% of the initial value

9. Consider the two transistor analogy of SCR, if α_1 & if α_2 are the common-base current gains of both the transistors then to turn-on the device
a) $\alpha_1 + \alpha_2$ should approach zero
b) $\alpha_1 \times \alpha_2$ should approach unity
c) $\alpha_1 - \alpha_2$ should approach zero
d) $\alpha_1 + \alpha_2$ should approach unity

10.Choose the correct statement:
GTOs have _____ as compared to the CTs.
a) less on-state voltage drop
b) less gate drive losses
c) higher reverse blocking capabilities
d) faster switching speed

PART-A (5*2=10 Marks)

11.Define threshold voltage of power MOSFET.

12.Mention the advantages of GTO over SCR

13. Mention the advantages of 'RC' triggering over 'R' triggering

14. List the different methods to turn on SCR.

15.Define forward current gain and current gain of transistor.