

SSM Institute of Engineering and Technology

Sindalagundu post, Dindigul-624-002, Tamilnadu pH: 0451-2448800 (Approved by AICTE, Affiliated to Anna University, Chennal Accredited by NAAC)

Department of Electrical and Electronics Engineering

Organizes

Six days Technology Training Program on

◆ PCB Design and Fabrication ◆

For the IV year students of EEE

from(02.12.2019 to 07.12.2019)

Trained by

Er.S.P.Sarathy Retired employee from Schneider Electric System India Pvt, Ltd, Chennai

Co-ordinators

Mr.G.Satheeshkumar.AP/EEE

HoD

Dr.V.Vijaykumar

Principal Dr.D.Senthilkumaran

ALL ARE INVITED Dr.D. SENTHIL KUMARAN, M.E., Ph.D., MUSS

SSM Institute of Engineering and Technology Kurtathuratti Village Sindalagundu Pol. KPE Road Distingul 634002.



SSM Institute of Engineering and Technology, Dindigul-02. Department of Electrical and Electronics Engineering

CIRCULAR

03.10.2019

This is to inform that value added program on PCB Design and Fabrication is going to be conducted for IV year EEE students from 02.12.2019 to 07.12.2019 by Er.S.P.Sarathy Retired Employee from Schneider Electric System India Pvt. Ltd, Chennai. Henceforth interested students are informed to register their name to Mr.G.Satheesh Kumar, AP/EE on or before 24.10.2019.

Fixelly Incharge

HOD/EEE



Dr.D.SENTHIL KUMARAN, M.E., Ph.D., (NUS)
Principal

SSM Institute of Engineering and Technology Kuttathupatti Village, Sindalagundu (Po), Pajani Road, Dindigul - 624 002



SSM Institute of Engineering and Technology Sindalagundu post, Palani main road, Dindigul – 624002, Tamilnadu.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING IV YEAR NAME LIST (2019-2020)

	IV YEAR NAMI	E LIST (2019-2020)
S.NO	REGISTER NO	NAME
1	922116105001	ABIRAMI R
2	922116105002	ANITHA K
3	922116105003	AZEEMA M
'4	922116105004	BALA SANDEEP G
5	922116105005	BANUPRIYA N
6	922116105006	DEVA SALOMI PRIYAM R
7	922116105007	DHAMOTHARAN R
8	922116105008	DHARANI N
9	922116105009	GOKUL P
10	922116105010	GOPI V
11	922116105011	HUDSON SAMRAJ A
12	922116105012	JAYAKKRISHNAN S
13	922116105013	JEYASHREE P
14	922116105014	KALAISELVANN
15	922116105015	KANNAN P
16	922116105016	KANNI PRAKASH D
17	922116105017	KARTHICK A
18	922116105018	MALATHI S
19	922116105019	MATHUMITHA B
20	922116105020	MOHAN RAJ S
21	922116105021	MYTHELI S
22.	922116105022	PREETHI R
23	922116105023	PRIYADHARSHINI J
24	922116105024	RAMANI CHIARA D
25	922116105025	RANJITH BABU S
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32	922116105033	SURIYA C R
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34	922116105035	VIJAYALAKSHMI M C S
35	922116105036	
36	922116105037	
37	9221161053037	
1 5 1 1	922116105304	The same of the sa
38	922116105306	
39	922116105701	S.VASIM AKRAM



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HoD/EEE



Dindigul-Palani Highway, Dindigul-624002

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

NAME LIST (2019-2020)

HANDS ON TRAINING ON PCB DESIGN AND MANUFACTURING

S.NO	REGISTER NO	NAME	SIGNATURE
Y ₁	922116105001	ABIRAMI R	Abiyamij
2	922116105002	ANITHA K	K. Anithe
3	922116105003	AZEEMA M	Ascena · A
4	922116105004	BALASANDEEP G	G. Balist
5	922116105005	BANUPRIYA N	N. Barupretty
6	922116105006	DEVA SALOMI PRIYAM R	R. deva
7	922116105007	DHAMOTHARAN R	R. Dhe Miloty
8	922116105008	DHARANI N	A Dhousery.
9	922116105009	GOKUL P	P. Grokul.
10	922116105010	GOPI V	V. Gopi
11	922116105011	HUDSUON SAMRAJ A	X. RAF
12	922116105012	JAYAKRISIINAN	Jaka Krishid
13	922116105013	JEYASREE P	P. Torestree
14	922116105014	KALAISELVAN N	N. fall
15	922116105015	KANNAN P	P. Kanning
16	922116105016	KANNIPRAKASH D	D.f.f.
17	922116105017	KARTHICK A	A boutlosty
18	922116105018	MALATHI S	S. Malathi
19	922116105019	MATHUMITHA B	8. right
20	922116105020	MOHAN RAJ S	MohanRaJi
21	922116105021	MYTHILI S	S. most
22	922116105022	PREETHI R	Drash
23	922116105023	PRIYADHARSHINI J	J. Priyadharshnini
24	922116105024	RAMANI CHIARA D	D. Ramile
25	922116105025	RANJITH BABU S	Ranith
26	922116105026	RESHMA SK	S. K REShma
27	922116105027	RISHYA DORA S	RIGHT RON
28	922116105028	SARAVANAN A	Savarahan Pancipa

SSM Institute of Engineering and Technology Kuttathupatti Village, Sindalagundu (Po),

29	922116105030	SIMRIN BANU A	Ar. Sindulationer
30	922116105031	SIVASELVAM S	S. Sim Salver.
31	922116105032	SUBALAKSHMI S	S-SUME
32	922116105033	SURIYA CR	Suriya
33	922116105034	SURYA SR	SR. Story
34	922116105035	VIJAYALAKSHMI MCS	Mcs. VIsugerkhehmi
35	922116105036	VISHNUKUMAR S	v shuhun
36	922116105037	YOGAJOTHI C	C. Yogithandy
37	922116105303	RUBAN RAJ S	Ruban Res
38	922116105304	SATHISHKUMAR M	u. saly
39	922116105306	VEERAPANDI T	T. Verrepearly
40	922116105701	VASIM AKRAM S	vosin kkr

Facult In charge

No NOINDIGUL-52

HOD/EEE

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Dindigul – Palani Highway, Dindigul – 624 002 DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Value added Course on PCB Design & Fabrication
Students Attendance Report

Roll No.	Register No.	Name of the Student	2 12	2019	03.12	2019	041	12.2019	05.13	2.2019	6 ₺ • 12.	2019	07.12	.2019
110.			FN	AN	FN	AN	FN"	AN	FN	AN	FN	AN	FN	AN
1	922116105001	ABIRAMI R	,	1	1	1	/	/	/	1	/	/	/	/
2	922116105002	ANITHA K	1	/		/	. /			/	/	,		-
3	922116105003	AZEEMA M	/	/	/	/		/	/	/		/	/	. /
4	922116105004	BALA SANDEEP G		1	,	AB		,	/	,	,	,	,	_
5	922116105005	BANUPRIYA N	/	,	1	/	/	/	/	/				
6	922116105006	DEVA SALOMI PRIYAM R	/		/	/	1		/	/			/	
7	922116105007	DHAMOTHARAN R	/	/	/	/	-		. /	/				1
8	922116105008	DHARANI N	1	/		1		/	1	1.	/	/	1	/
9	922116105009	GOKUL P	1	1	1	1	1	1	,	1	,	1	1	1
10	922116105010	GOPI V	^	1				1		/	1	. /	/	1
11	922116105011	HUDSON SAMRAJ A		1	1	1	1	1	/	/	1	-/	/	/
12	922116105012	JAYAKKRISHNAN S		/	/	/	/	,	1	1	1		/	1
13	922116105013	JEYASHREE P		/	/	1	/	/	1			1	1	
14	922116105014	KALAISELVAN N	1	/	/		/	1	1	/	/		1	1
15	922116105015	KANNAN P		AB	/		/	-	1	1	,		-	1
16	922116105016	KANNI PRAKASH D	/	1		/	/	/	1	/	/	/	1.	/
17	922116105017	KARTHICK A	1	/		/	/			_	1	/	1	/
18	922116105018	MALATHI S		/	/	/	/	- /		/	/	/	1	/
19	922116105019	MATHUMITHA B		/	/	/	/		/		/	/	/	/
20	922116105020	MOHAN RAJ S		/	/		1	/		/	/		/	1
21	922116105021	MYTHELI S	/	/	/		/	/	/	/		AB		/
22	922116105022	PREETHI-R	/	/			/		/	/	/	_	1	/
23	922116105023	PRIYADHARSHINI J		/	/	1	/		/		/		NTHIL KU	MARAN,
24	922116105024	RAMANI CHIARA D	(/		6	/		/	7		/	PII	incipal

.1., Ph.D., (NUS)

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Roll			2/12	119	3/12	2/19	411	2/19	5/12	119	6/12	119	7/12	119
No.	Dogictor No. Nome of the Student	Name of the Student	FN	AN	FN	AN	FN		EN	AN	FN	ÁN	FN	AN
25	922116105025	RANJITH BABU	1	7	1	1	AB	AB	1	/	/	1	/	
26	922116105026	RESHMA S K	7	/	1	/	1	× .	- 2	/		/		2
27	922116105027	RISHYA DORA S	-28	-	1	1	/	/	1	1	1	1	7	
28	922116105028	SARAVANAN A	1	/				/	/	/	/	/	/	/
29	922116105030	SIMRIN BANU A		/			/			/	1	/	1	/
30	922116105031	SIVA SELVAM P			1	1	/	/	/				/	/
31	922116105032	SUBA LAKSHMI S	/	/			/		1	/	1		/	/
32	922116105033	SURIYA C R	7					/	/	/				/_
33	922116105034	SURYA S R		/	1	/	1	/		/	/		/	/
34	922116105035	VIJAYALAKSHMI M C S		/			/	/	/	·-	-	/	/	/
35	922116105036	VISHNU KUMAR S		1	/	/	1	/	/	AB				
36	922116105037	YOGA JOTHI C	/	1			/	/	/	/	/	/	/	/
37	922116105303	RUBAN RAJ S	/-	/			/	/		/	/	/	/	/
38	922116105304	SATHEESH KUMAR M	/	_	/		/	,	/	/	1	1	- /	/
39	922116105306	VEERAPANDI T		1			/	/		/	/	/	1	/
40	922116105701	VASIM AKRAM S	,	/	1		/	/	/	/		/	/	/
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		Signature	2	9_	2	2	4	1	4	L	4_	4		1

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HoD/EEE

Dr.D.SENTHIL KUMARAN, M.E., Ph.B., (NUS)

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Paian. Road, Dindigul - 624 002

PCB DESIGN AND FABRICATION

Syllabus

Module I: (9 Hrs)

Introduction to Printed circuit board: fundamental of electronic components, basic electronic circuits, Basics of printed circuit board designing. Layout planning, general rules and parameters, ground conductor considerations, thermal issues, check and inspection of artwork.

Module II: (6 hrs)

Design rules for PCB: Design rules for Digital circuit PCBs, Analog circuit PCBs, high frequency and fast pulse applications, Power electronic applications, Microwave applications

Module III: (10 hrs)

oduction to Electronic design automation(EDA) toolsfor PCB designing: Brief Introduction of various Samulators, SPICE and PSPICE Environment, Selecting the Components Footprints as per design, Making New Footprints, Assigning Footprint to components, Net listing, PCB Layout Designing, Auto routing and manual routing. Assigning specific text (silkscreen) to design, Creating report of design, creating manufacturing data (GERBER) for design.

Module IV: (7 hrs)

Introduction printed circuit board production techniques: Photo printing, film- master production, reprographic camera, basic process for double sided PCBs photo resists, Screen printing process, plating, relative performance and quality control, Etching machines, Solders alloys, fluxes, soldering techniques, Mechanical operations.

Module V: (6 hrs)

Technology Trends: Multilayer PCBs. Multiwire PCB, Flexible PCBs, Surface mount PCBs, Reflow s .dering, Introduction to High-Density Interconnection (HDI) Technology.

Module VI: (7 hrs)

PCB design for EMI/EMC: Subsystem/PCB Placement in an enclosure, Filtering circuit placement, decoupling and bypassing, Electronic discharge protection, Electronic waste; Printed circuit boards Recycling techniques, Introduction to Integrated Circuit Packaging and footprints, NEMA and IPC standards.

Text Books:

1. Printed circuit board design, fabrication assembly and testing By R. S. Khandpur, Tata McGraw Hill 2006

Reference Books:

Manual Design and technology, Walter C. Bosshart

Coombs, Jr, Happy T.Holden, Publisher:

Manual M. Education Year: 2016 UI.D.SENTHIL VITE OF SER

> SSM Institute of Sar Kuttathupati 🧬

and Technology Maiagundu (Po),

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Palan, Rusu, January 624002.



Dindigul-Palani Highway, Dindigul-624002

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING undineering and to

NAME LIST (2019-2020)

HANDS ON TRAINING ON PCB DESIGN AND MANUFACTURING

CNO	REGISTER NO	NAME	MARK	
S.NO		ABIRAMI R	16	
1	922116105001	ANITHA K	14	
2	922116105002	AZEEMA M	17	
3	922116105003	BALASANDEEP G	13	
4	922116105004		Above 19 CHARLENE BOLD	
5	922116105005 922116105006	DEVA SALOMI PRIYAM R	18	
6	922116105007	DHAMOTHARAN R	1Ŧ	
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10		HUDSUON SAMRAJ A	13	
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12	922116105012	JEYASREE P	16	
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23	922116105023	RAMANI CHIARA D	18	
24	922116105024	RANJITH BABU S	19	120
25	922116105025		19 2	Titel
26	922116105026	RESHMA SK RISHYA DORA S	1 F Dr. D. SENTHIL KUMARAN, M.E	Ph D (N
27	922116105027	SARAVANAN A	15 Principal	
28	922116105028	SARAVANANA	SSM Institute of Engineering and	1 Technolo

SSM Institute of Engineering and Technology Kuttathupatti Village, Sindalagundu Po, Palani Road, Dindigul 624 002

29	922116105030	SIMRIN BANU A	17
30	922116105031	SIVASELVAM S	16
31	922116105032	SUBALAKSHMI S	18
32	922116105033	SURIYA CR	17
33	922116105034	SURYA SR	20
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38	922116105304	SATHISHKUMAR M	12
39	922116105306	VEERAPANDI T	14
40	922116105701	VASIM AKRAM S	13.



HOD/EEE

Dr.D.SENTHIL KUMARAN, M.E., Ph.D., (NUS)
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Dindigul – Palani Highway, Dindigul 624 002

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Value added Course Summary (2019-2020)

Course Name

: PCB Design and Fabrication

Course Duration : 48 Hours

Year offered

: IV year students -2019-2020

Course Instructors

: Mr. G. Satheeshkumar

Assistant professor /EEE

Course Outcome: The student able to apply the tools and technique of PCB design and Fabrication and able to program and control.

Course Type

: Self Framed / Collaboration with Industry

Assessment Mode

Attendance

: 48 Hours

Number of participants

: 40

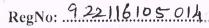
Scheme of Exam

: MCQ offline

Course Coordinator

Dr.D.SENTHIL KUMARAN, H.E., Ph. T. 1000 Principal

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Dindigul – Palani Highway, Dindigul – 624 002

Department of Electrical and Electronics Engineering/
Value added Course on PCB Fabrication and Manufacturing

Assessment Question

Answer for all the questions (Each questions carry one mark)

Max. Marks: 20 Marks

- 1. Which phenomenon is not reduced by the circuit paths of lowest impedances especially provided by power and return planes for shielding purposes?
- a) Radiation
- b) Convection

Noise

d) Crosstalk

- 2. High current circuits are purposely located or placed near the edge of PCB in accordance to the supply lines for
- a) Removal of heat
- b) Isolation of stray current
- exeduction of path length
- d) All of the above
- 3. Which among the below stated soldering methods is also renowned as 'High Frequency Resistance Soldering'?
- a) Iron Soldering
- b) Furnace Soldering

Torch Soldering

- d) Electrical Soldering
- 4. Which among the below mentioned approaches belongs to the category of In-circuit Testing?
- a) Impedance Testing
- Component Testing
- c) Apply Signal and check output
- d) All of the above
- 5. Which type of solderability testing is carried out for the generation of solder sample due to immersion of wire or sheet metal specimen in a bath of molten solder?
- a) Solder Bath Testing
- b) Mexiscus Rise Testing
- c) Solder Iron Testing
- None of the above



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- 6. What is/are the necessity/ies to provide guarding to precision differential amplifiers?
- a) To increase leakage resistance
- b) To reduce capacitance between signal conductors & ground
- Both a and b
- d) None of the above
- 7. Which among the below mentioned assertions is not a way of cross-talk reduction while designing digital PCBs?
- Decrease in the distance between conductors
- Mielding of clock lines with guard strips
- c) Reduction in the loop area of circuits
- d) Avoid running of parallel traces for longer distances especially for asynchronous signals
- 8. Which among the below mentioned packages does not belong to the category of 'Small Outline Package,'
- a) SO
- by SOP
- c) SOT
- d) SON
- 9. Which among the below specified assertions is not a grounding consideration associated with ADC as DAC?
- a) Analog side to analog ground
- b) Digital side to digital gound
- Ise of separate power supply and connection of their ground leads to single point reference
- d) Reduction of inductive loop area between power and return traces
- 10. Which among the below stated devices/equipments are preferred for elimination of ground and suppline noise especially in TTL/CMOS / ECL PCB designing?
- a) Coupling capacitor
- b) Decoupling capacitor
- Snubber circuits
- d) All of the above
- 11. Which among the below specified condition is precise in the crosstalk verification mechanism using logic flow in opposite direction with the limit of avoiding dangerous interference in digital PCB designing?

a) Leven / Zodd

V Zody≥ 0.5 Zeven

c) $Z_{dd} \ge 0.8 Z_{even}$

dyZodd = Zeven



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12. Which terminology of PCB represents a thin photo-sensitive pattern of single traces or IC pads for etching?	ve polymer by supporting photographic
a) Prepreg	
b) Etching	
c) Photo-resist	
d) Solder mask	
13. Which problems are about to occur if PCB is not designed	properly in a confined manner for digital
circuits?	
A. Diffraction	
B. Refraction	
Ground & Supply-line Noise	
D. Electromagnetic Interference	
A & B	
b) B & C	
c) C & D	
d) A, B, C, D	
14. Which among the following assists in obtaining the desired	d value of wave impedance in reflection phase
while designing digital PCBs?	- N
A. Width of signal lines	
B. Distance between signal line and ground line	
C. Signal Delays	
D. Double Pulsing	
a) A & B	
h) B & C	
9/C & D	
A, B, C, D	
	105 111
15. What should be the resistance of 0.6 mm wide conductor v	with 15 cm length and 25 µm thickness of
standard copper foil? (Assume $\rho = 1.7241 \times 10^{-6} (at 20^{\circ} C)$	
a) 118.2 mΩ	
b) 138.2 mΩ	
c) 172.4 mΩ	
d) 192.4 mΩ	
16. The actual cost of PCB can be evaluated on the basis of	
a) PCB wize & material	V 1 V
b) Number of layers	MIT
c) Vias on PCB	KIL
A) All of the above	A 1 7
/s)	Dr.D. SENTHIL KUMARAN, M.E., Ph.D., (NUS) Principal
	Dr.D.SENTHIL ROLLING and Technology
	time of Engineering and (Po).
the state of the s	SSM Institute of Engineering and Technology, Ruttathupatti Village, Sindalagundu (Po), Palazi Razak, Dindigul - 624 002.
	Palani Milan,

- 17. Which factors contribute to the occurrence of mechanical stress?
- iii Besonance
- Cracked Solder Joints
- c) Both a and b
- d) None of the above
- 18. Which type of PCB requires minimum soldering on component side in order to avoid replacement oriented difficulties?
- a) Single sided PCB
- M Double-sided PCB
- c) Both a and b
- d) None of the above
- 19. What effects can be observed if the separate power and ground planes are provided with large conducting surfaces for better decoupling in PCB layouts?
- a) Merense in self-inductance
- Meduction in self-inductance
- c) Stability in self-inductance
- d) None of the above
- 20) What is the first step in PCB design
- Specification
- (b) Schematic
- Manufacturing file
- Simulation

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RegNo: 922116105028



SSM INSTITUTE OF ENGINEERING AND TECHNOLOGY

Dindigul - Palani Highway, Dindigul - 624 002

Department of Electrical and Electronics Engineering Value added Course on PCB Fabrication and Manufacturing

Assessment Question

Answer for all the questions (Each questions carry one mark)

Max. Marks: 20 Mark

- 1. Which phenomenon is not reduced by the circuit paths of lowest impedances especially provided by power and return planes for shielding purposes?
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- b) Convection
 Noise
- d) Crosstalk

2. High current circuits are purposely	located or placed near the edge of PCB in accordance to the supply
lines for	

- a) Removal of heat
- b) Isolation of stray current
- c) Reduction of path length
- d) All of the above
- 3. Which among the below stated soldering methods is also renowned as 'High Frequency Resistance Soldering'?
- a) Iron Soldering
- b) Furnace Soldering
- , Torch Soldering
- d) Electrical Soldering
- 4. Which among the below mentioned approaches belongs to the category of In-circuit Testing?
- a) Impedance Testing
- b) Component Testing
- Apply Signal and check output
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- 5. Which type of solderability testing is carried out for the generation of solder sample due to immersion of wire or sheet metal specimen in a bath of molten solder?
- a) Solder Bath Testing
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- 6. What is/are the necessity/ies to provide guarding to precision differential amplifiers?
- a) To increase leakage resistance
- b) To reduce capacitance between signal conductors & ground

Both a and b

- d) None of the above
- 7 Which among the below mentioned assertions is not a way of cross-talk reduction while designing digital PCBs?
- a) Decrease in the distance between conductors
- b) Shielding of clock lines with guard strips
- c) Reduction in the loop area of circuits
- d) Avoid running of parallel traces for longer distances especially for asynchronous signals

87 Which among the below mentioned packages does not belong to the category of 'Small Outline Package

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- 9. Which among the below specified assertions is not a grounding consideration associated with ADC as well as DAC?
- a) Analog side to analog ground
- b) Digital side it digital ground
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- 10. Which among the below stated devices/equipments are preferred for elimination of ground and suppline noise especially in TTL/CMOS / ECL PCB designing?
- a) Coupling capacitor
- h) Decompling capacitor
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- 11. Which among the below specified condition is precise in the crosstalk verification mechanism using logic flow in opposite direction with the limit of avoiding dangerous interference in digital PCB designing?
- a) $Z_{even} > Z_{odd}$
- b) Z_{odd} ≥ 0.5 Z_{even}
- c) Zodd 20.8 Zeven

 $dXZ_{odd} = Z_{even}$



Dr.D. SENTHIL KUMARAN, M.E., Ph.D., (NUS)

SSM Institute of Engineering and Technology Kuttathupatti Village. Sindalagundu (1) Paiani Road Dindigui (2) (1)

12. Which terminology of PCB represents a thin photo-sensitive polymer by supporting photographic pattern of single traces or IC pads for etching? a) Prepreg b) Etching c)-Photo-resist d) Solder mask 13. Which problems are about to occur if PCB is not designed properly in a confined manner for digital circuits? A. Diffraction B. Refraction Q: Ground & Supply-line Noise D. Electromagnetic Interference A & B b) B & C c) C & D d) A, B, C, D 14. Which among the following assists in obtaining the desired value of wave impedance in reflection phase while designing digital PCBs? A. Width of signal lines B. Distance between signal line and ground line C. Signal Delays D. Double Pulsing a) A & B b) B & C c) C & D A, B, C, D 15. What should be the resistance of 0.6 mm wide conductor with 15 cm length and 25 µm thickness of standard copper foil? (Assume $\rho = 1.7241 \times 10^{-6}$ (at 20° C) a) $118.2 \text{ m}\Omega$ b) $138.2 \text{ m}\Omega$ c) 172.4 mQ d) $192.4 \text{ m}\Omega$ 16. The actual cost of PCB can be evaluated on the basis of a) PCB size & material b) Number of layers c) Vias on PCB Dr.D.SENTHIL KUMARAN, M.E., Ph.D., (NUS) d) All of the above Principal SSM Institute of Engineering and Technology

Kuttathupatti Village; Sindalagundu (Po), Palani Road, Dindigul 624 002.

- 17. Which factors contribute to the occurrence of mechanical stress? a) Resonance b) Cracked Solder Joints. c) Both a and b d) None of the above oriented difficulties?
- 18. Which type of PCB requires minimum soldering on component side in order to avoid replacement a) Single-sided PCB
- b) Double-sided PCB S) Both a and b
- d) None of the above
- 19. What effects can be observed if the separate power and ground planes are provided with large conducting surfaces for better decoupling in PCB layouts?
- a) Increase in self-inductance
- b) Reduction in self-inductance
- c) Stability in self-inductance
- d) None of the above
- 20) What is the first step in PCB design
- a) Specification
- b) Schematic
- c) Manufacturing file

d) Simulation

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Department of Electrical and Electronics Engineering
Value added Course on PCB Fabrication and Manufacturing

Assessment Question

Answer for all the questions (Each questions carry one mark)

Max. Marks: 20 Marks

- 1. Which phenomenon is not reduced by the circuit paths of lowest impedances especially provided by power and return planes for shielding purposes?
- a) Radiation
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- 2. High current circuits are purposely located or placed near the edge of PCB in accordance to the supply lines for
- a) Removal of heat
- b) Isolation of stray current
- c) Reduction of path length
- d) All of the above
- 3. Which among the below stated soldering methods is also renowned as 'High Frequency Resistance Soldering'?
- a) Iron Soldering
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- a) Solder Bath Testing
- b) Meniscus Rise Testing
- c) Solder Iron Testing
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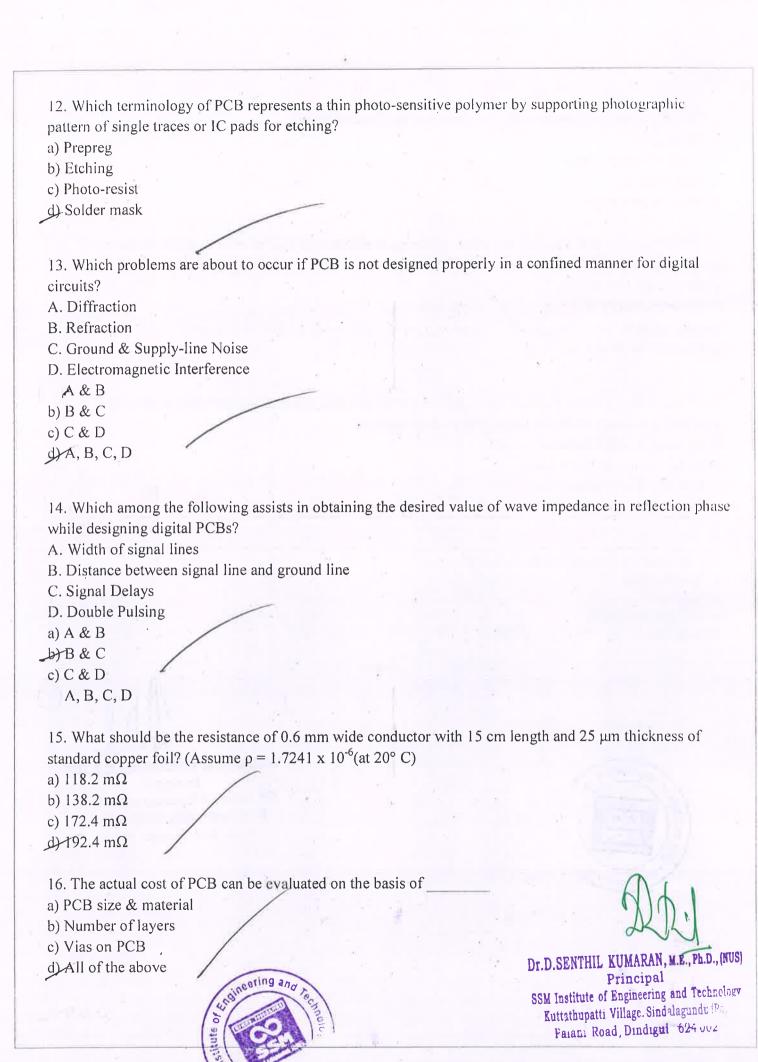
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Kuttathupatti Village. Sindalagundu 140,
Paian. Road, Dindigul 624 002

- 6. What is/are the necessity/ies to provide guarding to precision differential amplifiers?
- a) To increase leakage resistance
- b) To reduce capacitance between signal conductors & ground
- Both a and b
 - d) None of the above
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- a) Decrease in the distance between conductors
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- 8. Which among the below mentioned packages does not belong to the category of 'Small Outline Packages' does not belong to be a category of 'Small Outline Packages' does not belong to be a category of 'Small Outline Packages' does not be a catego
- a) SO
- b) SOP
- c) SOT
- et) SON
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- a) $Z_{even} > Z_{odd}$
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- $Z_{\text{odd}} \ge 0.8 Z_{\text{even}}$
- d) $Z_{odd} = Z_{even}$



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- 17. Which factors contribute to the occurrence of mechanical stress?
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- d) Simulation

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Department of Electrical and Electronics Engineering Value added Course on PCB Fabrication and Manufacturing

Assessment Question

Answer for all the questions (Each questions carry one mark)

Max. Marks: 20 Marks

- 1. Which phenomenon is not reduced by the circuit paths of lowest impedances especially provided by power and return planes for shielding purposes?
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- a) Iron Soldering
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- a) Solder Bath Testing
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- Solder Iron Testing
- d) None of the above



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- e) SOI
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Palani Road, Dindigul - 624 002

12. Which terminology	of PCB represents a thin photo-sensitive p	olymer by supporting photographic
	or IC pads for etching?	
a) Prepreg		
b) Etching	•	
c) Photo-resist	y =	
d) Solder mask		
,		
	e about to occur if PCB is not designed pro	perly in a confined manner for digital
circuits?		
A. Diffraction		
B. Refraction		
C. Ground & Supply-1		
P. Electromagnetic Int	erference	6
A & B		
DYB&C		
(c) C & D		
d) A, B, C, D		
14 Which among that	following assists in obtaining the desired va	due of wave impedance in reflection ph
		inde of wave impedance in reflection pin
while designing digital		
A. Width of signal line		
	ghal line and ground line	
C. Signal Delays		
D. Double Pulsing		
a) A & B		
h) R & C		
c) C & D		
A, B, C, D		
15 What about door the	manietanaa af O 6 mm suida aandustar suith	15 am langth and 25 um thickness of
	c resistance of 0.6 mm wide conductor with Assume $\rho = 1.7241 \times 10^{-6} (at 20^{\circ} C)$	· · · · · · · · · · · · · · · · · · ·
	Assume $p = 1.7241 \times 10^{-6}$ (at 20 °C)	
a) 118.2 mΩ		
(b) 138.2 mΩ	W 2"	
172,4 mΩ		
d) 192.4 m Ω		
16 (1)	DOD 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Λ
	PCB can be evaluated on the basis of	$ M \downarrow 0$
a) PCB size & materia	· · · ·	()(),
b) Number of layers		and
c) Vias on PCB		Dr.D.SENTHIL KUMARAN, M.E., Ph.D., (NUS)
d) All of the above	Regine oring and dectary	Principal
	S CHARLES OF	SSM Institute of Engineering and Technology
	Tarin minimum (e China)	Kuttathupatti Village, Sindalagundu (Po),
	SSM / /	Palani Road, Dindigul - 624 002
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- (c) Stability in self-inductance
- None of the above
- 20) What is the first step in PCB design
- a) Specification
- by Solymatic
- Minufacturing file
- a) Simulation



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Department of Electrical and Electronics Engineering Value added Course on PCB Fabrication and Manufacturing

Assessment Question

Answer for all the questions (Each questions carry one mark)

Max. Marks: 20 Marks

1. Which phenomenon is not reduced by the circuit paths of lowest impeda	nces especially provided by
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- 6 What is/are the necessity/ies to provide guarding to precision differential amplifiers?
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- 9. Which among the below specified assertions is not a grounding consideration associated with ADC as well as DAC?
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12. Which terminology of PCB represents a thin photo	-sensitive polymer by supporting photographic
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A. Diffraction	
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C. Ground & Supply-line Noise	
D. Electromagnetic Interference	
A & B	
b) B & C	
e) C & D	
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16. The actual cost of PCB can be evaluated on the ba	sis of
a) PCB size & material	2/1/
b) Number of layers	
	Dr.D.SENTHIL KUMARAN, M.E., Ph.D., (NU
15 4 11 (6.1)	Principal SSM Institute of Engineering and Technolog
d) All of the above	Kuttathupatti Village, Sindalagundu (Po), Palani Road, Dindigul - 624 002.

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Department of Electrical and Electronics Engineering Value added Course on PCB Fabrication and Manufacturing

Assessment Question

Answer for all the questions (Each questions carry one mark)	Max. Marks: 20 Mar
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Dr.D.SENTHIL KUMARAN, M.E., Ph.D., (NUS)

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What is the first step in PCB design

a) Specification

Schematic

o) Manufacturing file

d) Simulation

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Principal

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12. Which terminology of PCB represents a thin photo-sensitive polymer by supporting photographic pattern of single traces or IC pads for etching? a) Prepreg b) Etching c) Photo-resist d) Solder mask 13. Which problems are about to occur if PCB is not designed properly in a confined manner for digital circuits? A. Diffraction B. Refraction C. Ground & Supply-line Noise D. Electromagnetic Interference A & B b) B & C c) e & D d) A, B, C, D 14. Which among the following assists in obtaining the desired value of wave impedance in reflection phase while designing digital PCBs? A. Width of signal lines B. Distance between signal line and ground line Signal Delays 6. Nouble Pulsing a) A & B b) B & C 4) C& D A, B, C, D 15. What should be the resistance of 0.6 mm wide conductor with 15 cm length and 25 µm thickness of standard copper foil? (Assume $\rho = 1.7241 \times 10^{-6} (at 20^{\circ} C)$ a) 118.2 mΩ 6) 138.2 mΩ c) $172.4 \text{ m}\Omega$ d) $192.4 \text{ m}\Omega$. The actual cost of PCB can be evaluated on the basis of a) PCB size & material b) Number of layers of Engine c) Vias on PCB Dr.D.SENTHIL KUMARAN, M.E., Ph.D., (NUS) All of the above Principal

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Department of Electrical and Electronics Engineering

Hands on Training in PCB Design and Manufacturing

STUDENT FEEDBACK FORM

Year/Sem: 1 / V

Date: 07, 12.2019

Dear Student,



Thank you for your participation Hands on Training in **PCB Design and Fabrication**. We would like to hear from you - areas that you find useful and areas that you think we can do better. Your feedback will help us evaluate the effectiveness of this program and allow us to make improvements in future.

S.No	,	Rating						
	Criteria	Excellent	Very good	Good	Fair	Satisfactory		
1	Course content	1.						
2	Skill development					- x		
3	Motivation		1			4		
4	Regularity and punctuality of trainer							
5	Coverage of syllabus				9)	15.5		
6	Interaction							
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8	Outcome	4	V					

Feel free to give QUALITATIVE comments too

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Department of Electrical and Electronics Engineering

Value added course on PCB Design and Manufacturing

STUDENT FEEDBACK FORM

Year/Sem: W [VII

Date: 07/12/2019

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Value added course on PCB Design and Manufacturing

STUDENT FEEDBACK FORM

Year/Sem: IV /VII
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6	Interaction							
7	Individual attention		-					
8	Outcome							

Feel free to give QUALITATIVE comments too

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Department of Electrical and Electronics Engineering

Hands on Training in PCB Design and Manufacturing

STUDENT FEEDBACK FORM

Year/Sem: 07/12/19 4 18/1/11

Date:

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8	Outcome							

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Department of Electrical and Electronics Engineering

Hands on Training in PCB Design and Manufacturing

STUDENT FEEDBACK FORM

Year/Sem: N / vin

Date:

07.32.2019

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This is to certified that Mr./Ms.ABIRAM of IV-EEE has successfully completed the value added program on PCB Design and Fabrication from 02.12.2019 to 07.12.2019 organized by Schneider Electric System India Pvt.Ltd, Chennai.

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