

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

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Organizes

Six days Hands on training program on "PCB Design and Fabrication"

For the IV year students of EEE

from (03.12.2018 to 08.12.2018)

Trained by

Er.S.P.Sarathy, Former Schneider Electric System India Pvt, Ltd, Chennai.

Co-ordinator

HoD

Principal

Mr.B.Marisekar,AP/EEE

Dr.P.Booma devi

Dr.Saravanan

ALL ARE INVITED



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

CIRCULAR

18.06.2018

This is to inform that Hands on training program on PCB Design and Fabrication is going to be conducted for IV-year EEE students from 03.12.2018 to 08.12.2018 by Er.S.P.Sarathy, Former Schneider Electric System India Pvt. Ltd, Chennai. Henceforth interested students are informed to register their name to Mr.B.Marisekar, AP / EEE on or before 17.10.2018.

Faculty Incharge

HoD/EEE

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)

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)

PCB Technology Trends: Multilayer PCBs. Multiwire PCB, Flexible PCBs, Surface mount PCBs, Reflow 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:

1. Printed circuit Board Design and technology, Walter C. Bosshart

2. Printed Circuits Handbook, Sixth Edition, by Clyde F. Coombs, Jr, Happy T.Holden, Publisher: McGraw-Hill Education Year: 2016



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

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING IV YEAR NAME LIST (2018-2019)

S.NO	REGISTER NO	NAME
1	922115105001	ABARNA. K
2	922115105002	AKILAN.N
3	922115105003	ANAND.T
4	922115105004	ANIT DAYANA. A
5	922115105005	ANTO HUBERT. J
6	922115105006	ANUSHA. K
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28	922115105028	MARIA MINISHA. S
29	922115105029	MASANADEVI. J
30	922115105030	MASI. R
31	922115105031	MOHAMED ABDUL AYUB.M
32	922115105032	MOHAMED SALMAN. S
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36	922115105036	NAVEEN ROMI. J

37	922115105037	NEWTONSLENDO. J
38	922115105038	PANDIPRIYANKA. M
39	922115105039	PRASANTH.I
40	922115105040	PRIYANKA.R.M
41	922115105041	RAJKUMAR. A
42	922115105042	RAMACHANDRAN, M
43	922115105043	RAMKUMAR. L
44	922115105044	RAMYA.V
45	922115105.045	ROBERT RAJA.A
46	922115105046	SHARMILA. M
47	922115105047	SHRIVISHNUKUMAR. V
48	922115105048	SINDHU. M
49	922115105049	SOURAV PRASANNA. V
50	922115105050	SUNDAR RAJAN. K
51	922115105051	THAMARAI KANNAN. B
52	922115105052	THANGA PANDIAN P
53	922115105053	VIDHYA. U
54	922115105054	VIGNESH.L
55	922115105055	VIGNESHWAR. E
56	922115105056	VIJAYPANDI. S
57	922115105057	VISHAL ADHITHYA.A
58	922115105058	VISHNU. V
59	922115105059	VIVEK KUMAR. G
60	922115105701	CYRIL VALAN.J

Gass Incharge

P. P. D. HOD/EEE



Dindigul-Palani Highway, Dindigul-624002

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

NAME LIST (2018-2019)

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3	922115105003	ANAND.T	T. AMAS L
4	922115105004	ANIT DAYANA. A	A. 1944 P
5	922115105005	ANTO HUBERT. J	J. AHA
6	922115105006	ANUSHA K	S. Anusha
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11	922115105011	BHARATHI PERIYASAMY.S	200
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18	922115105018	GURU SRI K	Le Coules 80:

9	922115105019	JANANI P	Jonni P.
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1	922115105021	JEYASURYA S	8. Jule
.2	922115105022	KARTHICK R	R.KARTHICK.
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24	922115105024	KARUPPAIAH.M	P. karleifa M. Karungt
25	922115105025	KAVITHA.R	Sanita. R.
26	922115105026	KIRUTHIHA K	k. kuly
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28	922115105028	MARIA MINISHA. S	S. Marialty
29	922115105029	MASANADEVI.I	1. Malyof
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31	922115105031	MOHAMEDABDULAYUB.M	M. Mohamarldapdulagent.
32	922115105032	MOHAMED SALMAN. S	S. pungl
33	922115105033	MUSRATH N	ful no
34	922115105034	MUTHU RAJ K	YAP.
35	922115105035	NARTHIGA SREE D	cel-
36	922115105036	NAVEEN ROMI. J	Revery
37	922115105037	NEWTONSALANDO J	Newton
38	922115105038	PANDIPRIYANKA. M	M. Paryl
39	922115105039	PRASANTH I	Doubth. I.
40	922115105040	PRIYANKA R M	M.P.
41	922115105041	RAJKUMAR. A	Rojhund . A.
42	922115105042	RAMACHANDRAN. M	M. Rapach -
43	922115105043	RAMKUMAR. L	Rayred)
44	922115105044	RAMYA V	V-Ramya

45	922115105045	ROBERT RAJA.A	Robert Roja. A.
46	922115105046	SHARMILA M	pr. Shand
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49	922115105049	SOURAV PRASANNA. V	L. Souls
50	922115105050	SUNDAR RAJAN K	K. Slinder
51	922115105051	THAMARAI KANNAN. B	Dansand Land
52	922115105052	THANGA PANDIAN P	D. Sharf
53	922115105053	VIDHYA U	V. Vidhera
54	922115105054	VIGNESH.L	2. vigase
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56	922115105056	VIJAYAPANDI.S	S. Vijayup de +71
57	922115105057	VISHAL ADITIYA A	A. VISHAL ADTTIYA
58	922115105058	VISHNU. V	V. Vishet.
59	922115105059	VIVEK KUMAR. G	Versketmir G -
60	922115105701	CYRIL VALAN.]	cylil.

Faculty In-charge

HOD/EEE.



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Hands on Training Program on PCB Design & Fabrication Students Attendance Report

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Name		ABARNA. K	AKILAN.N	ANAND.T	ANIT DAYANA. A	ANTO HUBERT. J	ANUSHA. K	ARUN. S	ARUN RAJ. K	BAIZ. N	BALAJI. J	BHARATH	BOOMA. R	DEEPAK RAJ. K.A	DEVAKI. S	DEVARAJ. S	GOBIYA. C	GOWSALYA.V	GURU SRI. K	JANANI. P	JANSI. S	JEYA SURYA. J	KARTHICK. R	KARTHIKA. P	KARIIPPAIAH M
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25	922115105025	KAVITHA.R	\	\	\	\	1	\	<	(•		\	\	
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31	922115105031	MOHAMED ABDUL AYUB.M	\	1	1	1	1	1	1		/	/	/	/	E.
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35	922115105035	NARTHIGASREE. D	1		/	1	/	/		(/	\		\	5
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Dindigul-Palani Highway, Dindigul-624002

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

NAME LIST (2018-2019)

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19	922115105019	JANANI P	20
20	922115105020	JANSI. S	3013
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28	922115105028	MARIA MINISHA. S	1°1
29	922115105029	MASANADEVI.I	13
30	922115105030	MASI R	12-
31	922115105031	MOHAMEDABDULAYUB.M	15
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46	922115105046	SHARMILA M	13
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55	922115105055	VIGNESHWAR. E	18
56	922115105056	VIJAYAPANDI.S	16
57	922115105057	VISHAL ADITIYA A	IF
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60	922115105701	CYRIL VALAN.]	17

Faculty In-charge

P. Dr.



RegNo: 922+15105058

Max. Marks: 20 Marks

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)

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

Radiation

- h) Convection Noise
- d) Crosstalk
- 2. High current circuits are purposely located or placed near the edge of PCB in accordance to the supply line for
- ar 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's
- 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 cheek 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
- Meniscus Rise Testing
- c) Solder Iron Testing
- d) None of the above

6. What is/are the necessity/ies to provide guarding to precision differential amplifiers? a) To increase leakage resistance by Toreduce capacitance between signal conductors & ground c) Both a and b 1) None of the above 7. Which among the below mentioned assertions is not a way of cross-talk reduction while designing digital a) Decrease in the distance between conductors b) Shielding of clock lines with guard strips 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 Packages a) SO b) SOP c) SOT dy SOX Which among the below specified assertions is not a grounding consideration associated with ADC as a) Analog side to analog ground b) Digital side to digital ground 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 supp line noise especially in TTL/CMOS / ECL PCB designing? a) Coupling capacitor b) Decoupling capacitor Snubber-circuits All of the above 11. Which among the below specified condition is precise in the crosstalk verification mechanism using logic flow in apposite direction with the limit of avoiding dangerous interference in digital PCB designing? a) $Z_{\text{even}} \geq Z_{\text{odd}}$ JY Zodd ≥ 0/5 Zeven c) Z_{odd} \geq 0.8 Z_{even} d) $Z_{odd} = Z_{even}$

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	
d) Soldiz mask	
13. Which problems are about to occur if PCB is not designed properly in a confined manner for digital	a)
circuits?	
A. Diffraction	
B. Refraction	
C. Ground & Supply-line Noise	
D. Electromagnetic Interference	
A & B	
6) 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	
h) 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)f
standard copper foil? (Assume $\rho = 1.7241 \times 10^{-6} (at 20^{\circ} C)$	
a) 18.2 mΩ	
$M + 38.2 \text{ m}\Omega$	
c) 172.4 m Ω	
d) 192.4 m Ω	
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	
d) All of the above	

17. Which factors contribute to the occ	urrence of mechanical stress?
at Resonance	
b) Cracked Solder Joints.	
c) Both a and b	
d) None of the above	
18. Which type of PCB requires minim	um soldering on component side in order to avoid replacement
oriented difficulties?	
a) Single-sided PCB	
b) Double-sided PCB	
CH30th a and b	
d) None of the above	
10 What effects can be observed if the	separate power and ground planes are provided with large
conducting surfaces for better decoupling	
a) Increase in self-inductance	ng m retriayouts.
b) Reduction in self-inductance	
Sability in self-inductance	
d) None of the above	
dianone of the above	
20) What is the first step in PCB design	n /
a) Specification	
b) Schematic	
c) Manufacturing file d) Simulation	1994
My Difficultivity	

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RegNo: 922115105004

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?
- a) Radiation
- W 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'?
- Iron Soldering
- by 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
- 6) 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 of sheet metal specimen in a bath of molten solder?
- a Solder Bath Testing
- b) Meniscus Rise Testing
- Solder Iron Testing
- d) None of the above

- 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
- c) 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 Bs?
- a) Decrease in the distance between conductors
- by 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
- 8. Which among the below mentioned packages does not belong to the category of 'Small Outline Package
- SOP
- c) SOT
- d) SON
- 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 to digital ground
- c) Use 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
- 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
- c) Snubber circuits
- All of the above
- 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) Zeven > Zodd
- b) $Z_{odd} \ge 0.5 Z_{even}$
- c) $Z_{odd} \ge 0.8 Z_{even}$
- d Lodd = Zeven

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	
y C & D	
d) A, B, C; D	
14. Which among the following assists in obtaining the desired value of wave impedance in reflection phase	2
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	
h) B & C	
x) 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	
b) $138.2 \text{ m}\Omega$	
c) 172.4 mΩ	
dy 192.4 ms2	
16/The actual cost of PCB can be evaluated on the basis of	
PCB size & material	
b) Number of layers	
c) Vias on PCB	
d) All of the above	

Which factors contribute to the occurrence of mechanical stress? Resonance b) Cracked Solder Joints. c) Both a and b 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 Double-sided PCB e) 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 inducting surfaces for better decoupling in PCB layouts? a) Increase in self-inductance Preduction in self-inductance c) Stability in self-inductance d) None of the above (1) What is the first step in PCB design (a) Specification Schematic c) Manufacturing file d) Simulation



RegNo: 922115105023

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 Marks

- 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
- 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
- er 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
- h) 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
- 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) Meniscus Rise Testing
- €) Solder Iron Testing
- d) None of the above

6. What is/are the necessity/ies to provide guarding to precision differential amplifiers? a) Vo increase leakage resistance To reduce capacitance between signal conductors & ground c) 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 (a) Decrease in the distance between conductors M 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 8/Which among the below mentioned packages does not belong to the category of 'Small Outline Package (a) SO b) SOP SOT d) SON 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 to digital ground (se 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 supp Inc noise especially in TTL/CMOS / ECL PCB designing? a) Coupling capacitor b) Decoupling capacitor Snubber circuits d) All of the above Which among the below specified condition is precise in the crosstalk verification mechanism using Togic flow in opposite direction with the limit of avoiding dangerous interference in digital PCB designing? a) $Z_{even} > Z_{odd}$ b) $Z_{\text{odd}} \ge 0.5 Z_{\text{even}}$ c) $Z_{odd} \ge 0.8 Z_{even}$ $Z_{odd} = Z_{even}$

	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
	Lat Etching .
	c) Photo-resist
	di-Solder mask
-	
	12 Which well-many houtes are is DCD is not designed assembly in a reasonable assembly in the first and assembly in the fi
	13. Which problems are about to occur if PCB is not designed properly in a confined manner for digital
\nearrow	circuits?
	Diffraction
	B. Refraction
1	C. Ground & Supply-line Noise
	D. Electromagnetic Interference
	A & B
	b) B & C
	e)C&D
	d) A, B, C, D
	14. Which among the following assists in obtaining the desired value of wave impedance in reflection phase
1	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 m Ω
	ϕ) T38.2 m Ω
	c) 172.4 m Ω
	d) 192.4 m Ω
	d) 192.441182
	The natural exect of BCP, can be evaluated on the basis of
4	16. The actual cost of PCB can be evaluated on the basis of
	a) PCB size & material
	b) Number of layers
	et Vias on PCB
	d) All of the above

17/Which factors contribute to the occurrence of mechanical stress? Resonance b) Cracked Solder Joints. c) Both a and by 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 b) Double-sided PCB 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 fonducting surfaces for better decoupling in PCB layouts? a) Increase in self-inductance b) Reduction in self-inductance Stability in self-inductance d) None of the above What is the first step in PCB design) Specification /b) Schematic c) Manufacturing file 'd) Simulation



RegNo: 922115105 043

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

- Which phenomenon is not reduced by the circuit paths of lowest impedances especially provided by power and return planes for shielding purposes?
- a) Radiation
- h) 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
- h) Isolation of stray current
- Reduction of path length
- d) All of the above
- 8. Which among the below stated soldering methods is also renowned as 'High Frequency Resistance Soldering'?
- a) Iron Soldering
- b) Furrace Soldering

Yorch 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
- 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) Meniscus Rise Testing
- Solder Iron Testing
- d) None of the above

6. What is/are the necessity/ies to provide guarding to precision differential amplifiers? To increase leakage resistance b) To reduce capacitance between signal conductors & ground c) 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 CBs? 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 8. Which among the below mentioned packages does not belong to the category of 'Small Outline Packages' b) SOP SOT d) SON 9. Which among the below specified assertions is not a grounding consideration associated with ADC as Vell as DAC? a) Analog side to analog ground b) Digital side to digital ground cyUse 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 Which among the below stated devices/equipments are preferred for elimination of ground and supp /line noise especially in TTL/CMOS / ECL PCB designing? a) Coupling capacitor b) Decoupling capacitor Snubber sircuits d) All of the above II. 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) Zeven > Zodd Zodd ≥ 0.5 Zeven c) Z_{odd} ≥ 0.8 Z_{even} d) $Z_{odd} = Z_{even}$

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
erc & D
d) A, B, C, D
14. Which among the following excipts in obtaining the desired value of years immedance in reflection place
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
LATE & C
e) C & D
A, B, C, D
a, nayou
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
b) 138.2 mΩ
c) 172.4 mΩ
d) 192.4 m/2
16. The actual cost of PCB can be evaluated on the basis of
a) CB size & material
b) Number of layers
c) Vias on PCB
d) All of the above

17. Which factors contribute to the occurrence of mechanical stress? 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? Single-sided PCB b) 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 onducting surfaces for better decoupling in PCB layouts? a) Increase in self-inductance b) Reduction in self-inductance c) Stability in self-inductance d) Nove of the above (1) What is the first step in PCB design a) Specification by Schematic c) Manufacturing file d) Simulation



RegNo: 92211510550

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?
- 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) solation of stray current
- 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
- Norch 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
- 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) Meniscus Rise Testing
- c) Solder Iron Testing
- d) None of the above

6. What is/are the necessity/ies to provide guarding to precision differential amplifiers? To increase leakage resistance b) To reduce capacitance between signal conductors & ground (c) Both a and b d) None of the above Which among the below mentioned assertions is not a way of cross-talk reduction while designing digital a) Decrease in the distance between conductors Shielding of clock lines with guard strips 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 Packages a) SO by SOP 40 SOT d) SON 9. Which among the below specified assertions is not a grounding consideration associated with ADC as Analog side to analog ground b) Digital side to digital ground c) Use 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 supp ling noise especially in TTL/CMOS / ECL PCB designing? a) Coupling capacitor b) Decoupling capacitor c) Smibber circuits_ 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) $Z_{even} > Z_{odd}$ b) Zodd \ge 0.5 Zeven c) Z_{cold} ≥ 0.8 Z_{even} V Zodd = Zeven

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
p) Photo-resist
d) Solder mask
ay oorder mass
13. Which problems are about to occur if PCB is not designed properly in a confined manner for digital
circuits?
A. Dafraction
_B. Refraction
Cround & Supply-line Noise
D. Electromagnetic Interference
A & B
MB&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 μ m thickness of standard copper foil? (Assume $\rho = 1.7241 \times 10^{-6} (at 20^{\circ} C)$ a) 118.2 m Ω b) 138.2 m Ω c) 172.4 m Ω d) 192.4 m Ω
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
d) All of the above

- 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
- Which type of PCB requires minimum soldering on component side in order to avoid replacement oriented difficulties?
- a) Single-sided PCB
- 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 unducting surfaces for better decoupling in PCB layouts?
- a) Increase in self-inductance
- b) Reduction in self-inductance
- Stability in self-inductance
 - d) None of the above
 - What is the first step in PCB design
 - a) Specification
 - b) Schematic
 - e) Manufacturing file
- de dimulation



RegNo: 922115105016

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)



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

by Convection

Noise

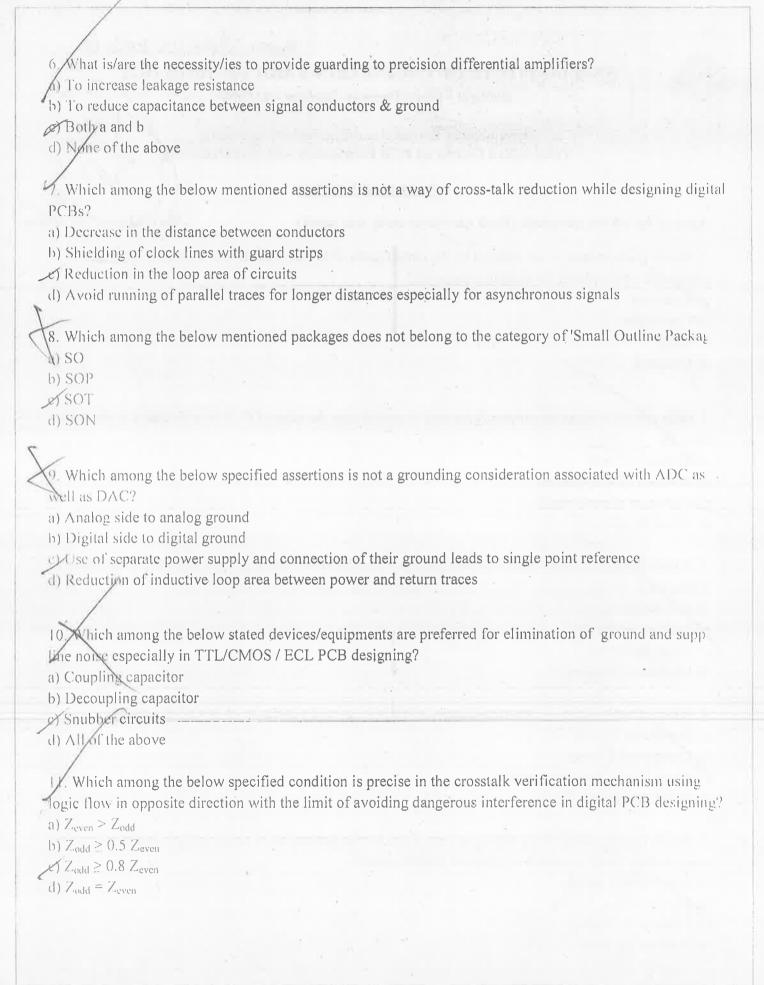
d) Crosstalk

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

- a) Kemoval 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
- 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
- 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) Meniscus Rise Testing
- Solder Iron Testing
- d) None of the above



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) 8older mask	
13. Which problems are about to occur if PCB is not designed properly in a confined manner for digital	
reuits?	
A. Diffraction	
B. Refraction	
C. Ground & Supply-line Noise	
D. Electromagnetic Interference	
A & B	
b) B & C	
c) C & D	
A) A, B, C, D	
Which among the following assists in obtaining the desired value of wave impedance in reflection phas	se
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	
h) B & C	
CC&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) 1J8.2 mΩ	
b) 138.2 mΩ	
c) 172.4 m Ω	
d) $192.4 \text{ m}\Omega$	
16. The actual cost of PCB can be evaluated on the basis of	
a) CB size & material	
b) Number of layers	
c) Vias on PCB	
d) All of the above	

17. Which factors contribute to the occurrence of mechanical stress? a) Resonance M Cracked Solder Joints. 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 fiented difficulties? a) Single-sided PCB b) Double-sided PCB 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 onducting surfaces for better decoupling in PCB layouts? a) Increase in self-inductance 1 Reduction in self-inductance c) Stability in self-inductance d) None of the above (0) What is the first step in PCB design a) Specification b) Schematic (c) Manufacturing file d) Simulation

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SSM INSTITUTE OF ENGINEERING AND TECHNOLOGY

Dindigul – Palani Highway, Dindigul – 624 002

Department of Electrical and Electronics Engineering

Hands on Training in PCB Design and Manufacturing

STUDENT FEEDBACK FORM

Year/Sem: V./VII

Date: 67)12 2018

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.

3.2	Criteria	Rating					
S.No		Excellent	Very good	Good	Fair	Satisfactory	
1	Course content	· V		41	(e	×	
2	Skill development	a 2					
-3	Motivation	×				1 23	
4_	Regularity and punctuality of trainer					41	
5	Coverage of syllabus					- A.	
6	Interaction				- tx		
7	Individual attention			V	· i		
8	Outcome	U	9	- 1			

Feel free to give QUALITATIVE comments too

Signature of the student with name

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Dindigul – Palani Highway, Dindigul – 624 002

Department of Electrical and Electronics Engineering

Hands on Training in PCB Design and Manufacturing

STUDENT FEEDBACK FORM

Year/Sem: 4 / 7

Date: 07 | 12 / 18

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.

			a e	Rating		
S.No	Criteria	Excellent	Very good	Good	Fair	Satisfactory
1 :63	Course content	-				7
2	Skill development	p.ec		V		
3	Motivation		X III			
4	Regularity and punctuality of trainer	* • I	1			
5	Coverage of syllabus	V	· ·		E 381	
6	Interaction	_ 1 7				y - 1,
7_	Individual attention				y v =	2
8	Outcome				- 7	* E

Feel free to give QUALITATIVE comments too

Signature of the student with name

M. Sindhu

Dindigul – Palani Highway, Dindigul – 624 002

Department of Electrical and Electronics Engineering

Value added course on PCB Design and Manufacturing

STUDENT FEEDBACK FORM

Year/Sem: 1 - VII

Date: 07(12)18

Dear Student,

Thank you for your participation Value added Course on **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.

	24	V = 1		Rating		
S.No	Criteria	Excellent	Very good	Good	Fair	Satisfactory
1	Course content				82	8.7
2	Skill development		. ×			
3	Motivation				-	
4	Regularity and punctuality of trainer					
5	Coverage of syllabus	Y	/			24)
6	Interaction					
7	Individual attention			1 V	R	
8	Outcome					A1 301 E

Feel free to give QUALITATIVE comments too

Signature of the student with name

Anngh



Dindigul – Palani Highway, Dindigul – 624 002

Department of Electrical and Electronics Engineering

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STUDENT FEEDBACK FORM

Year/Sem: 1/1 - VII Date: 07. 12.18

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ne La		Rating					
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2	Skill development			-		8	
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6	Interaction						
7	Individual attention		✓		2		
8	Outcome				×	-	

Feel free to give QUALITATIVE comments too

student with name

Dindigul - Palani Highway, Dindigul - 624 002

Department of Electrical and Electronics Engineering

Value added course on PCB Design and Manufacturing

STUDENT FEEDBACK FORM

Year/Sem: 1 / vii

Date: 07.12.16

Dear Student,

Thank you for your participation Value added Course on **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.

		Rating					
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6	Interaction	12		✓		G. A.	
7	Individual attention	<u></u>	10				
8	Outcome		1				

Feel free to give QUALITATIVE comments too

GURU SRI · K Signature of the student with name



Dindigul - Palani Highway, Dindigul - 624 002

CERTIFICATE

IV-EEE has successfully completed the Hands on Training program on PCB Design and Fabrication from 03.12.2018 to 08.12.2018 organized by Schneider This is to certified that Mr./Ms.XISHNU. Electric System India Pvt.Ltd, Chennai.





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