

SSM Institute of Engineering and Technology, Dindigul-02.

Department of Electrical and Electronics Engineering

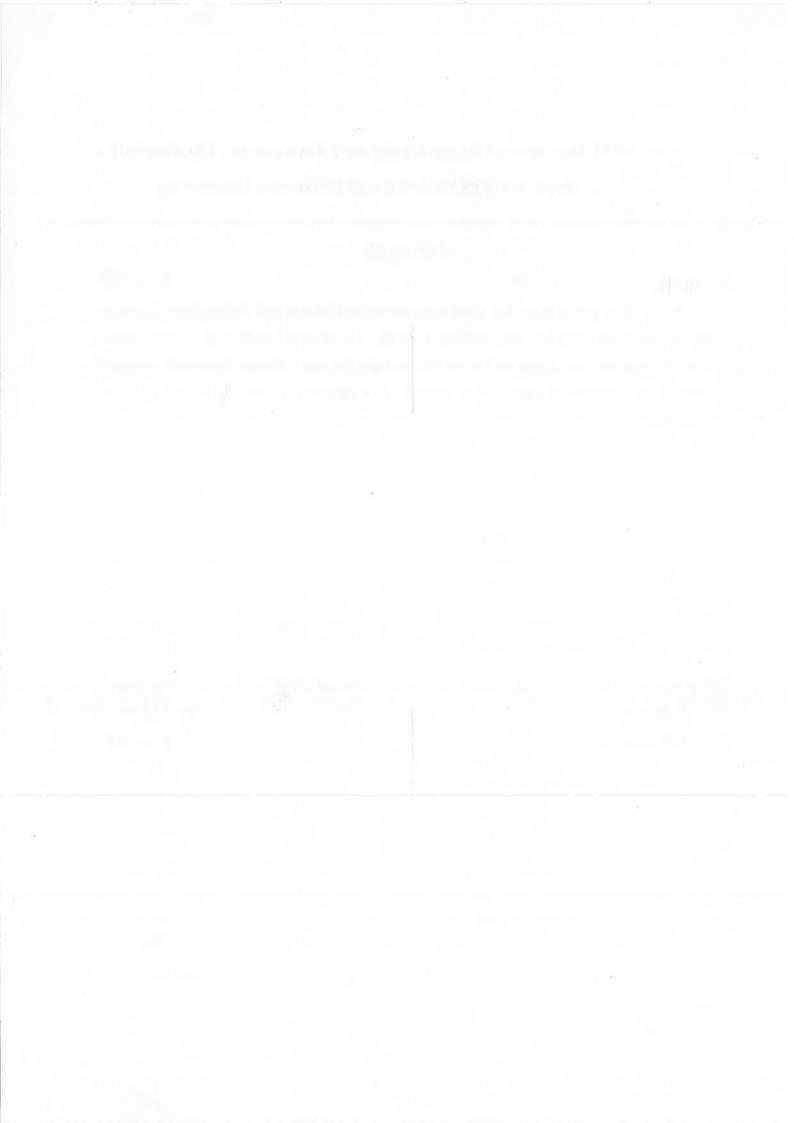
CIRCULAR

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.

Faculty Incharge

A. Vijant





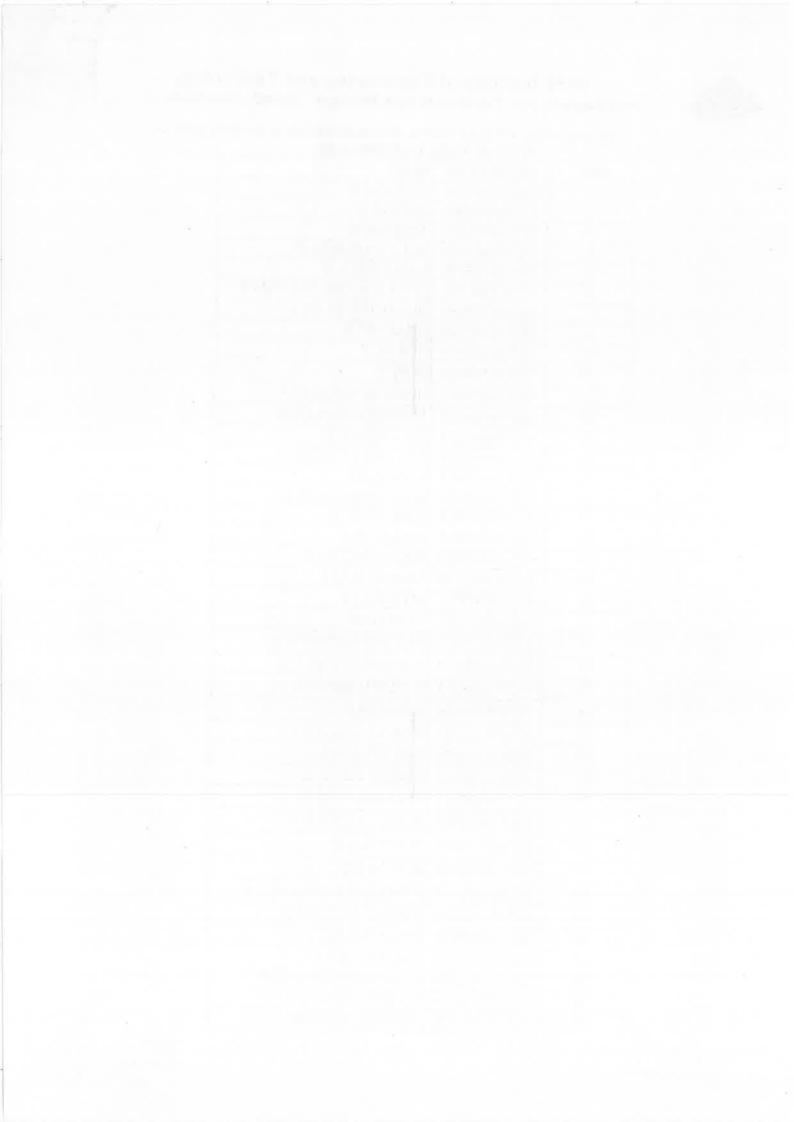
SSM Institute of Engineering and Technology Sindalagundu post, Palani main road, Dindigul – 624002, Tamilnadu.

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

S.NO		E LIST (2019-2020) NAME
1	ATA GAO I BITTI	ABIRAMI R
2	922116105001	ANITHA K
3	922116105003	AZEEMA M
94	922116105004	BALA SANDEEP G
5	922116105005	BANUPRIYA N
6	922116105006	DEVA SALOMI PRIYAM R
7	922116105007	DHAMOTHARAN R
8	922116105008	DHARANI N
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13	922116105013	JEYASHREE P
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17	922116105017	KARTHICK A
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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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28	922116105028	SARAVANAN A
		SIMRIN BANU A
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34	922116105035	VIJAYALAKSHMI M C S
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SSM INSTITUTE OF ENGINEERING AND TECHNOLOGY

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
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5	922116105005	BANUPRIYA N	N. Banyon J
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18	922116105018	MALATHI S	S. Malatri
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24	922116105024	RAMANI CHIARA D	D. Ramiel P
25	922116105025	RANJITH BABU S	Ranjuh
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28	922116105028	SARAVANAN A	3 grange nangt

29	922116105030	SIMRIN BANU A	A. Sinusthan
30	922116105031	SIVASELVAM S	S. Sim Solver.
31	922116105032	SUBALAKSHMI S	s-supel
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37	922116105303	RUBAN RAJ S	Ruban Reg
38	922116105304	SATHISHKUMAR M	in. saly
39	922116105306	VEERAPANDI T	T. Vericeparely
40	922116105701	VASIM AKRAM S	Vosin Eks

Facult In charge

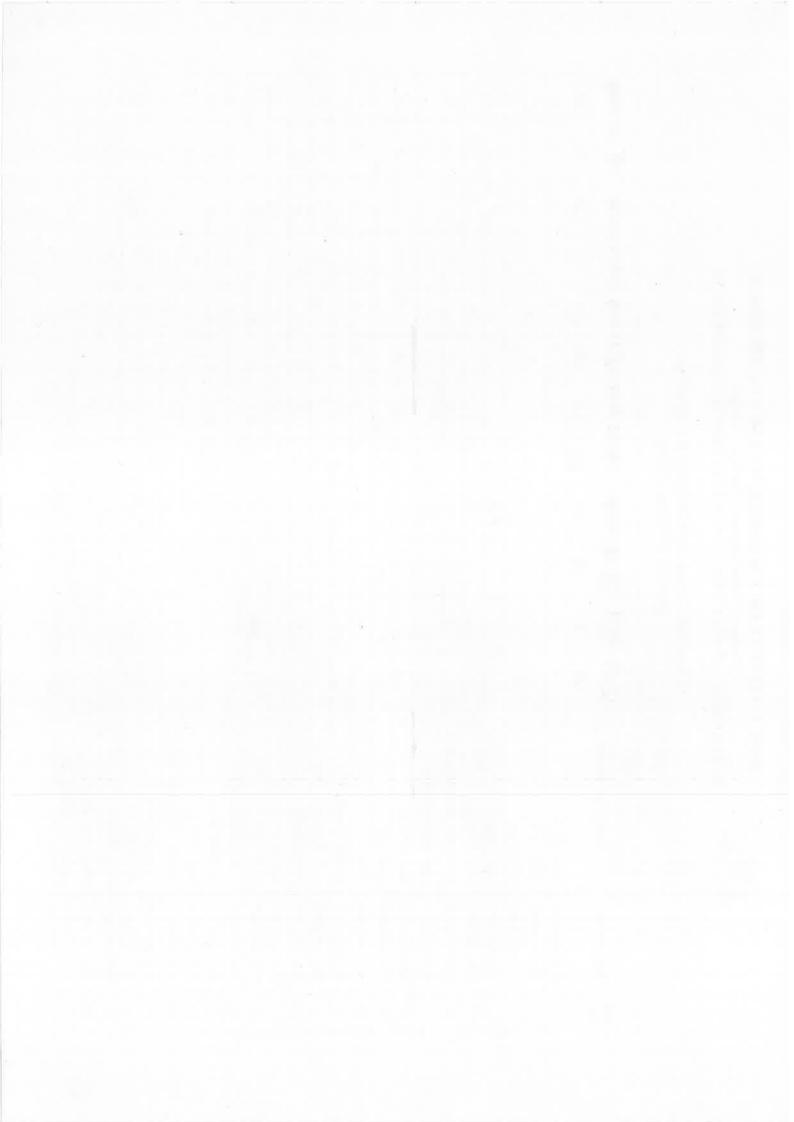
Q. May HOD/EEE



SSM 1. STITUTE OF ENGINEERING AND JECHNOLOGY Dindigul – Palani Highway, Dindigul – 624 002 DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Value added Course on PCB Design & Fabrication Students Attendance Report

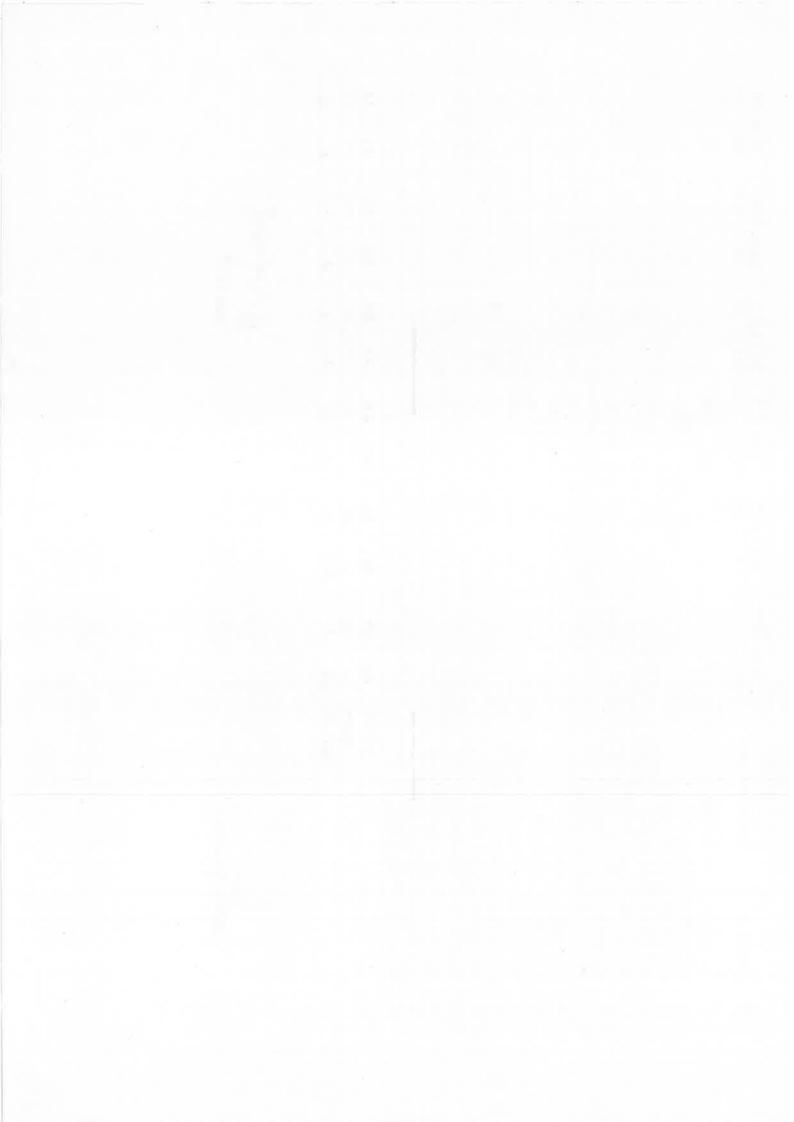
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M. W. HODÆEE





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)

roduction to Electronic design automation(EDA) toolsfor PCB designing: Brief Introduction of various simulators, 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 and Jering, 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.

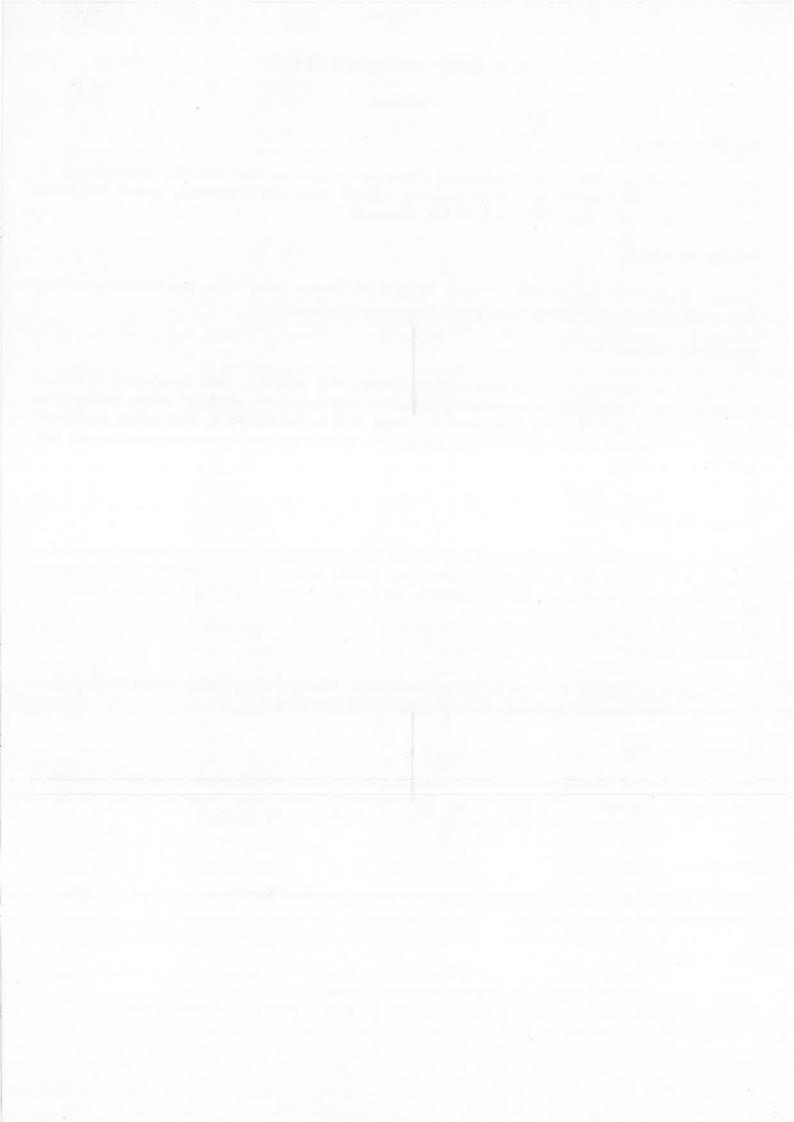
Text Books:

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

Dindigul-Palani Highway, Dindigul-624002

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

NAME LIST (2019-2020)

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25	922116105025		19
26	922116105026	RESHMA SK RISHYA DORA S	17
27	922116105027		15
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32	922116105033	SURIYA CR	17
33	922116105034	SURYA SR	20
34	922116105035	VIJAYALAKSHMI MCS	19
35	922116105036	VISHNUKUMAR S	IF
36	922116105037	YOGAJOTHI C	15
37	922116105303	RUBAN RAJ S	
38	922116105304	SATHISHKUMAR M	12
39	922116105306	VEERAPANDI T	14
40	922116105701	VASIM AKRAM S	13.

Faculty In-charge

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RegNo: 922116105014

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

- 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
- 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

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
- cyApply 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
- 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 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 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 by 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 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 line noise especial 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 by Zody≥ 0.5 Zeven c) Zadd ≥ 0.8 Zeven $dYZ_{odd} = Z_{even}$

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
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 mΩ
c) 172.4 mΩ
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
d) All of the above
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17 Which factor	rs contribute to the	a cacurrance	ofmachanic	of otnoop?			
	is contribute to the	e occurrence	or mechanic	ar stress?			
a) Resonance	Y 4						
b) Cracked Sold	er Joints.		•				
c) Both a and b							
d) None of the a	bove /						
18. Which type of	of PCB requires m	ninimum solo	dering on co	nnonent sid	de in order t	o avoid renla	acement
oriented difficult		1		nponon, on	# V	o aroia repi	
a) Single-sided F		/					
b) Double-sided							
Both a and b	100						
d) None of the al	DOVE /						
) Reduction in s							
c) Stability in seld) None of the al 20) What is the a) Specification b) Schematic c) Manufacturing	first step in PCB of	design					
d) None of the al 20) What is the a) Specification b) Schematic c) Manufacturing	first step in PCB of	design					
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d) None of the al 20) What is the a) Specification b) Schematic c) Manufacturing	first step in PCB of	design	****				
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d) None of the al 20) What is the a) Specification b) Schematic c) Manufacturing	first step in PCB of	design	****				4
d) None of the al 20) What is the a) Specification b) Schematic c) Manufacturing	first step in PCB of	design	****				
d) None of the al 20) What is the a) Specification b) Schematic c) Manufacturing	first step in PCB of	design	****				
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d) None of the al 20) What is the a) Specification b) Schematic c) Manufacturing	first step in PCB of	design	****				

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RegNo: 922 116 155 026

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

- 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 pla	iced near the edge of PC	B 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
- c) Apply Signal and eneck 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? a) To increase leakage resistance b) To reduce capacitance between signal conductors & ground -er 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 b) Shielding of clock lines with guard strips c) Reduction in the loop area of circuits dy 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' does not belong to the a) SO b) SOP c) SOT et) 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 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 line noise especially in TTL/CMOS / ECL PCB designing? a) Coupling capacitor b) Decoupling capacitor c) 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) $Z_{even} > Z_{odd}$ b) Z_{odd} ≥ 0.5 Z_{even} $Z_{odd} \ge 0.8 Z_{even}$ 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
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 $\rho = 1.7241 \times 10^{-6} (at 20^{\circ} C)$
a) $118.2 \text{ m}\Omega$
b) 138.2 mΩ
c) 172.4 mΩ
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
d) All of the above

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 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 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) 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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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.

Max. Macks: 20 Marks

1. Which phenoi	menon is	not reduced by th	e circuit path:	s of lowest i	impedances	s especially p	provided by
power and return	n planes f	or shielding purp	ses?				
a) Radiation	*			*			
b) Convection		/	<i>E</i>				

Noise d) Crosstalk

b) Meniscus Rise Testing
c) Solder Iron Testing
d) None of the above

2. High current circuits are purposely located or placed near the edge lines for	of PCB in accordance to the supply
3. Which among the below stated soldering methods is also renowned Soldering'? a) Iron Soldering b) Furnace Soldering Torch Soldering d) Electrical Soldering	as 'High Frequency Resistance
 4. Which among the below mentioned approaches belongs to the cate a) Impedance Testing b) 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 wire or sheet metal specimen in a bath of molten solder? a) Solder Bath Testing	of solder sample due to immersion of

6. What is/arc the necessity/ies to provide guarding to precision differential amplifiers? a) Lo 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 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 Package 9. Which among the below specified assertions is not a grounding consideration associated with ADC as well as DAC? a) Analog side to avalog ground b) Digital side to digital ground Ouse 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) Decompling 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) Zeven > Zodd b) $Z_{odd} \ge 0.5 Z_{even}$ c) Z_{odd} ≥ 0.8/Z_{even} $XZ_{\text{odd}} = Z_{\text{even}}$

12. Which torminology of PCB	3 represents a thin photo-sensitive poly	mer by supporting photographic
pattern of single traces or IC pa		mer by supporting photograpme
a) Prepreg		
b) Etching		
c)_Photo-resist		
d) Solder mask		
	A Section 1	
12 Which problems are about	to occur if PCB is not designed proper	ly in a confined manner for digital
circuits?	to occur if I CD is not designed proper	in a comment manner for displace
A. Diffraction		
B. Refraction		
Cround & Supply-line Nois	e	
D. Electromagnetic Interference		9
A&B		
(b) B & C		
c) C & D		
d) A, B, C, D		
14 Which among the followin	a against in obtaining the decired value	of wave impedance in reflection phase
while designing digital PCBs?		of wave impedance in terrection phase
A. Width of signal lines		
B. Distance between signal line	e and ground line	
C. Signal Delays	o and ground imp	
D. Double Pulsing		
a) A & B		
h) B & C		· ·
g) C & D		
A, B, C, D		
,,,		
15. What should be the resistar	nce of 0.6 mm wide conductor with 15	cm length and 25 µm thickness of
standard copper foil? (Assume		
a) 118.2 mΩ	H	
b) 138.2 mΩ		
c) 172.4 mΩ		
d) 192.4 mΩ		
The actual cost of PCB can	be evaluated on the basis of	<u>-</u>
a) PCB 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) Rasonance M Cracked Solder Joints c) Both a and b dr 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 in Double-sided PCB e) Both 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 in PCB layouts? an Increase in self-inductance Meduction in self-inductance e) Stability in self-inductance d) None of the above 20) What is the first step in PCB design a) Specification (h) Schematic Vianufacturing file d) Simulation



Department of Electrical and Electronics Engineering

Value added Course on PCB Fabrication and Manufacturing

Assessment Question

Answer for all the questions (Ea	ch questions carry one mark)
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. Which phenomenon is not reduced by the circuit pat	hs of lowest impedances especially provided by
nower and return planes for skielding purposes?	
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
1	a) Removal of heat
1	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
Ų	Torch Soldering
	d) Electrical Soldering
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	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

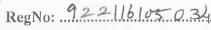
wire or sheet metal specimen in a bath of molten solder?

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) 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
PCBs?
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 Package a) SO
b) SOP
9 801
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
of the 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 are not to be be be being a few plants one number of few climination of ground and ground
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
c) 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) $Z_{\text{even}} > Z_{\text{odd}}$ b) $Z_{\text{odd}} \ge 0.5$ Z_{even} d) $Z_{\text{odd}} = Z_{\text{even}}$

12. Which terminology of PCB represents a thin photo-sensitive polymer by s	upporting photographic
pattern of single traces or IC pads for etching?	
a) Prepreg	
b) Etching	
c) Photo-resist	
d) Solder mask	
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13. Which problems are about to occur if PCB is not designed properly in a co	onfined manner for digital
circuits?	
A. Diffraction	
B. Refraction	
C. Ground & Supply-line Noise	
D. Electromagnetic Interference	
A & B	
DR&C	
c) C & D	
d) A, B, C, D	
d) A, B, C, B	
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. Doyble Pulsing	167
at A & B	
b) B & C	9
c) C & D	
(a) A, B, C, D	
, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	
15. What should be the resistance of 0.6 mm wide conductor with 15 cm leng	th and 25 um thickness of
standard copper foil? (Assume $\rho = 1.7241 \times 10^{-6} (at 20^{\circ} \cdot C)$	ar and 25 µm threeness of
a) 118.2 m Ω	
ϕ) 138.2 m Ω	
$172.4 \text{ m}\Omega$	
d) 192.4 m Ω	
16. The actual cost of PCB can be evaluated on the basis of	×
16. The actual cost of PCB can be evaluated on the basis ofa) PCB size & material	
· -	
b) Number of layers	4
c) Vias on PCB d)-All of the above	
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17. Which factors contribute to the occurrence of mechanical stress? a) Resenance b) Cracked Solder Joints er Both a and b d) Mone of the above 18. Which type of PCB requires minimum soldering on component side in order to avoid replacement oriented difficulties? a) Single-sided P&B b) Double-sided PCB Ci 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? as Increase in self-inductance b) Reduction in self-inductance et Stability in self-inductance Its None of the above 20) What is the first step in PCB design a) Specification b) Salvematic c) Manufacturing file dy Simulation



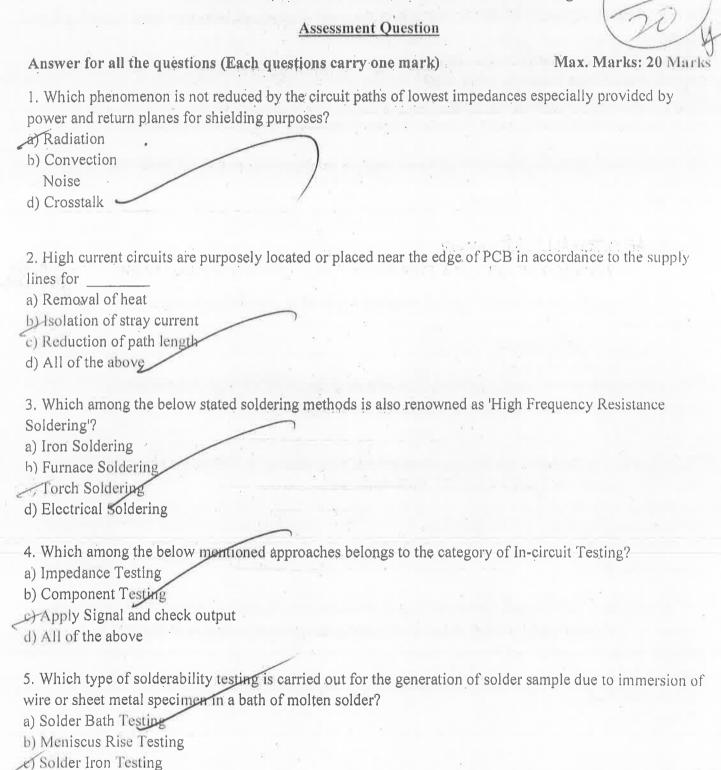


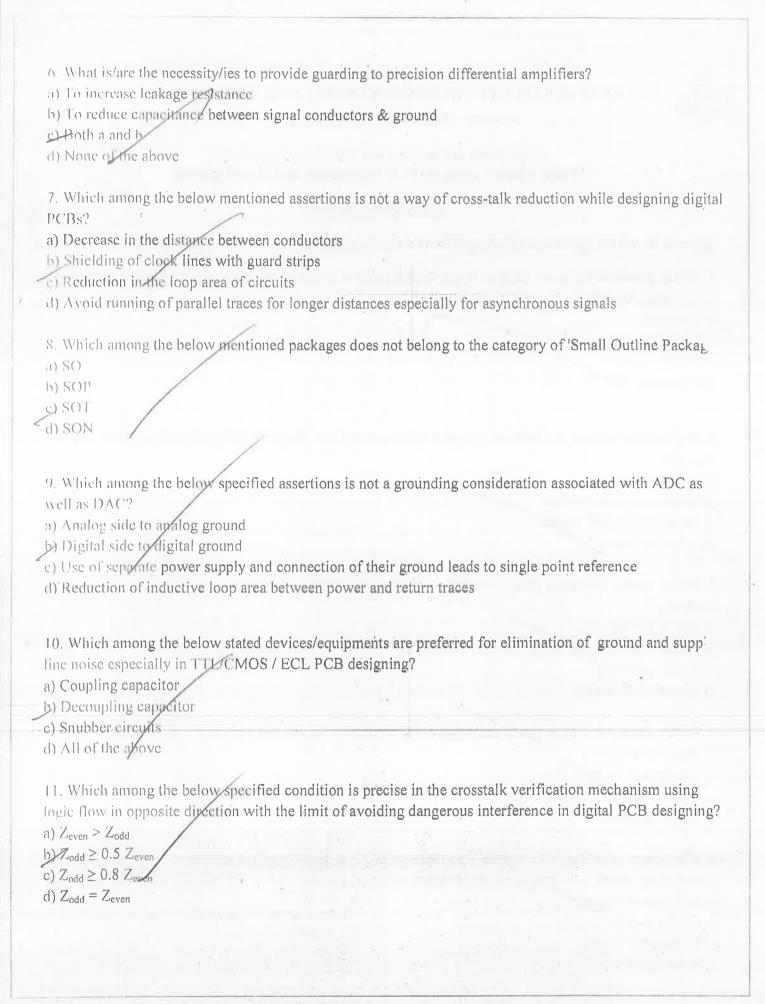
d) None of the above

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Dindigul - Palani Highway, Dindigul - 624 002

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





12. Which transitions of DCD represents a thin photo consistive polymer by supporting photographic
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
e) C & D
d) A, B, C, D
The state of the s
14. Which among the following assists in obtaining the desired value of wave impedance in reflection ph
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A. Width of signal lines
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C. Signal Delays
D. Double Pulsing
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by B & C
c) C & D
(a: A, B, C, D)
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a) $118.2 \text{ m}\Omega$
b) $138.2 \text{ m}\Omega$
$\approx 172.4 \text{ m}\Omega$
d) 192.4 m Ω
u) 152.4 ms2
16. The actual cost of PCB can be evaluated on the basis of
a) PCB size & material
b) Number of layers
Vias on PCB
d) All of the above

17. Which factors contribute to the occurrence of mechanical stress? b) Cracked Solder Joints Afforth a and h. di Noncol the above 18. Which type of PCB requires minimum soldering on component side in order to avoid replacement priented difficulties? at Single-sided PCB h) Double-sided PCB Both 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 in PCB layouts? a) Increase in self-inductance/ by Reduction in self-inductance Stability in self-inductance d) None of the above 20) What is the first step in PCB design Manufacturing file d) Simulation

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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) 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 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 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) 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?	
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b) To reduce capacitance between signal conductors & ground	
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d) None of the above	
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a) Decrease in the distance between conductors	
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Reduction in the loop area of circuits	
d) Avoid running of parallel traces for longer distances especially for asynchronous sign	nals
8. Which among the below mentioned packages does not belong to the category of 'Sma	all Outline Packag
a) SO	
b) SOP	
ASOT	
d) SON	
a) Analog side to analog ground by Digital side to digital ground c) Use of separate power supply and connection of their ground leads to single point ref d) Reduction of inductive loop area between power and return traces	Perence
10. Which among the below stated devices/equipments are preferred for elimination of line noise especially in TTL/CMOS / ECL PCB designing?	ground and supp
n) Coupling capacitor	
Decoupling capacitor	
nubber circuits	
d) Albelthe above	
11. Which among the below specified condition is precise in the crosstalk verification making the logic flow in opposite direction with the limit of avoiding dangerous interference in digital conditions.	
a) Zeven > Zodd	2 2
b) Z _{odd} ≥ 0.5 Z _{even}	
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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
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	13. Which problems are about to occur if PCB is not designed properly in a confined manner for digital
	circuits?
	A. Diffraction
	B. Refraction
1	C. Ground & Supply-line Noise
X	D. Electromagnetic Interference
/	A & B
	b) B & 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
-	Signal Delays
	D. Double Pulsing
	a) A & B
	h) R & C
	WEED.
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	15. What should be the resistance of 0.6 mm wide conductor with 15 cm length and 25 µm thickness of
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	6. The actual cost of PCB can be evaluated on the basis of
1	(a) PCB size & material
	b) Number of layers
(c) Vias on PCB
	All of the above
9	an all of the door of

- 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
- 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
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- 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
- by Reduction in self-inductance
- of Stability in self-inductance
- A None of the above
- 20) What is the first step in PCB design
- a) Specification
- he hematic
- c) Manufacturing file
- d) Simulation

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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: 1 / VII
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.

	:0	Rating						
S.No	o Criteria	Excellent	Very good	Good	Fair	Satisfactory		
1	Course content	- 2						
2	Skill development			1		A		
3	Motivation		Λ			*		
4	Regularity and punctuality of trainer							
5	Coverage of syllabus							
6	Interaction							
7	Individual attention			1				
8	Outcome							

Feel free to give QUALITATIVE comments too

Signature of the student with name kannan. P



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: N /VII

Date: 07/12/2019

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						
S.No	Criteria	Excellent	Very good	Good	Fair	Satisfactory		
1	Course content			/				
2	Skill development		1	Į.				
3	Motivation			/				
4	Regularity and punctuality of trainer		<u> </u>					
5	Coverage of syllabus	~						
6	Interaction			/				
7	Individual attention							
8	Outcome		/					

Feel free to give QUALITATIVE comments too

Signature of the 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: W /VII

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S.No		Excellent	Very good	Good	Fair	Satisfactory	
1	Course content			Vi			
2	Skill development			1			
3	Motivation						
4	Regularity and punctuality of trainer						
5	Coverage of syllabus	1					
6	Interaction						
7	Individual attention						
8	Outcome						

Feel free to give QUALITATIVE comments too

Signature of the student with name

Ruboun Roij .

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:	07/1	2/19	8	·IV/	VII
	, ,		1	-	-

Date:

Dear Student,

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	No Criteria	Rating					
S.No		Excellent	Very good	Good	Fair	Satisfactory	
1	Course content						
2	Skill development						
3	Motivation	w		19		14	
4	Regularity and punctuality of trainer		1				
5	Coverage of syllabus		<u></u>		*	x II	
6	Interaction						
7	Individual attention						
8	Outcome						

Feel free to give QUALITATIVE comments too

A. Hudson Laneag Signature of the student with hame A. HUDSON SAMRAJ



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: N

ณ์ / ข์แ

Date:

07.32.2019

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	Criteria	Excellent	Very good	Good	Fair	Satisfactory
1	Course content	-				
2	Skill development		✓			
3	Motivation					
4	Regularity and punctuality of trainer					
5	Coverage of syllabus					
6	Interaction			·		
7	Individual attention				× *	
8	Outcome					

Feel free to give QUALITATIVE comments too

Signature of the student with name

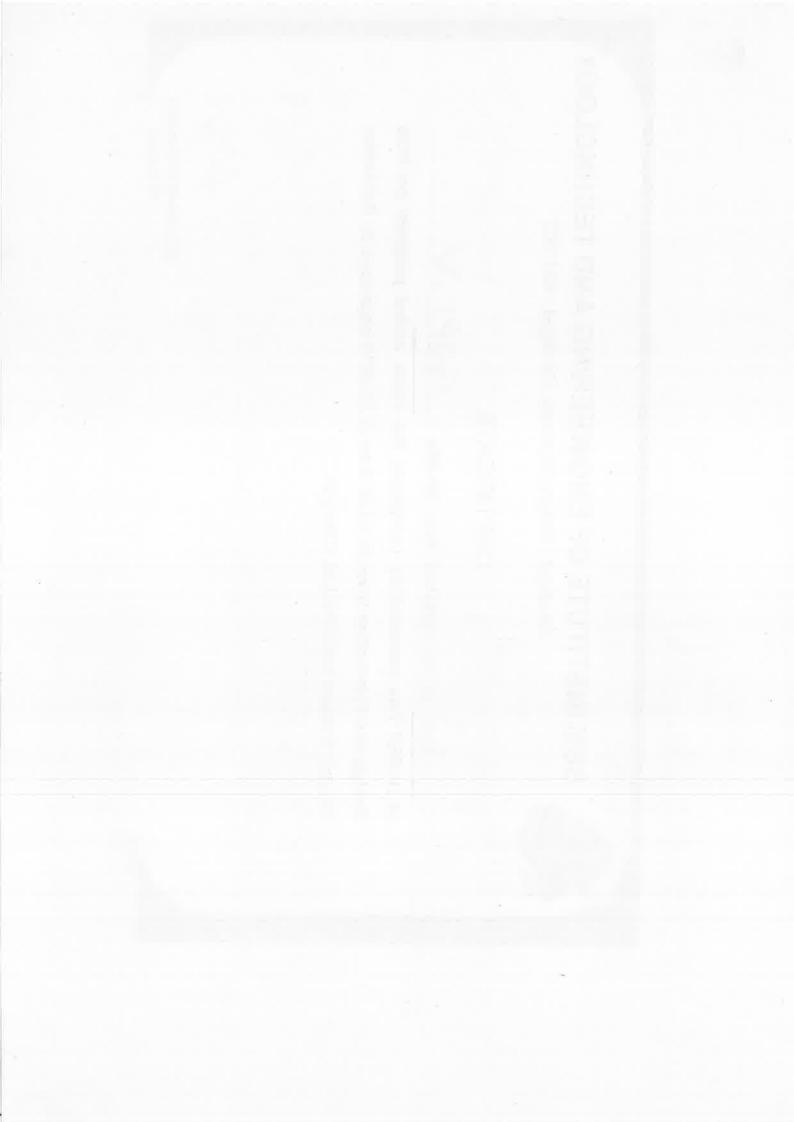
R. PREETH!



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CERTIFICATE

This is to certified that Mr./Ms. GOPL ... 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. ALALY.



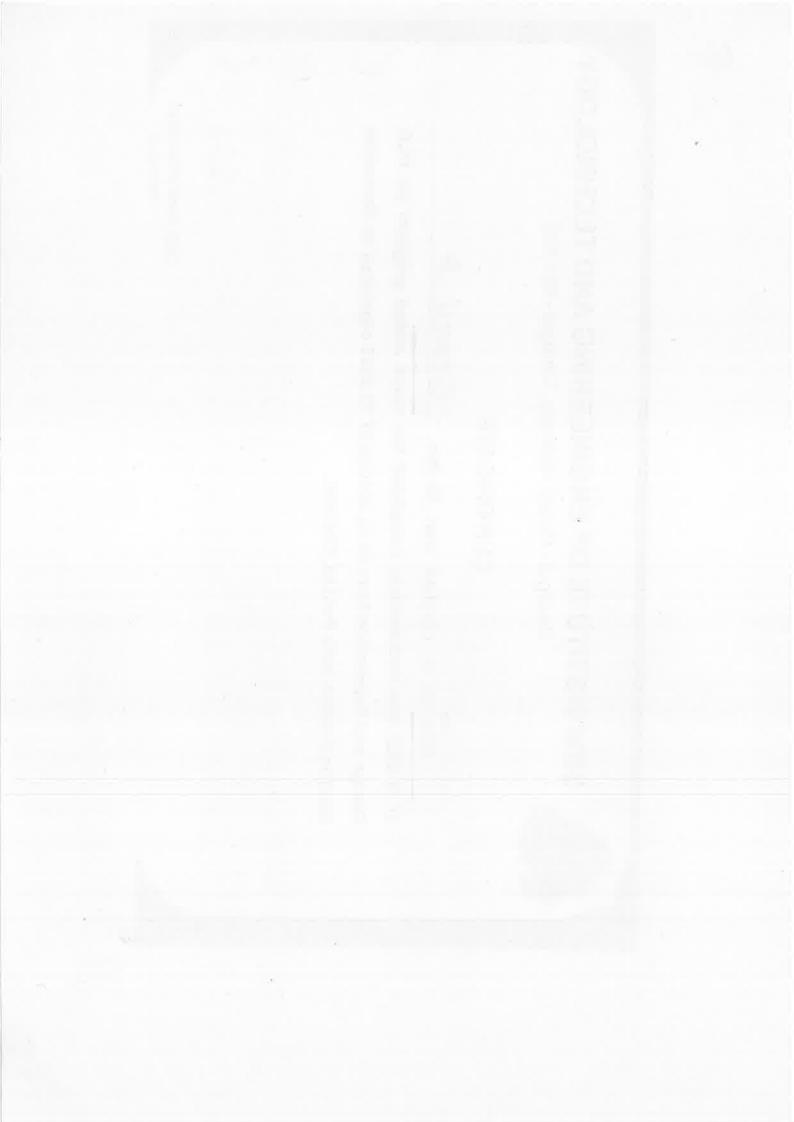


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CERTIFICATE

This is to certified that Mr./Ms.GIDKUL. ? 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.



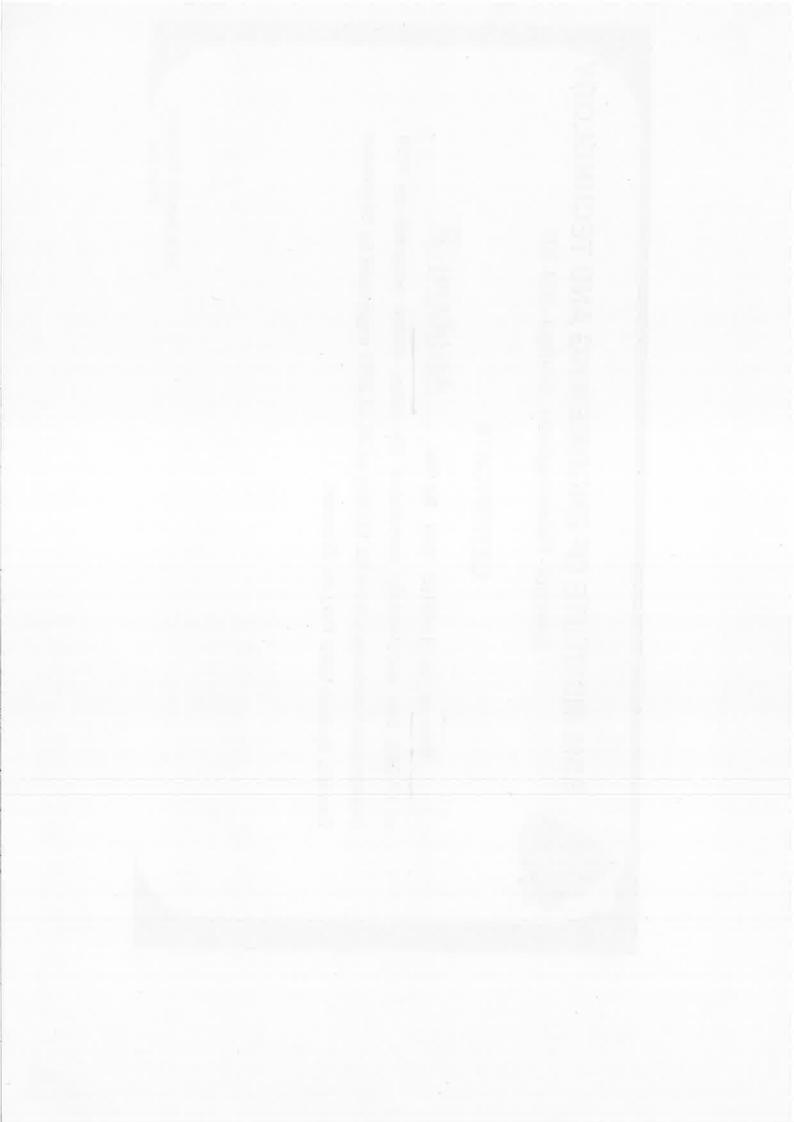




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CERTIFICATE

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 This is to certified that Mr./Ms.ABIRAMI. R. Electric System India Pvt.Ltd, Chennai. A A

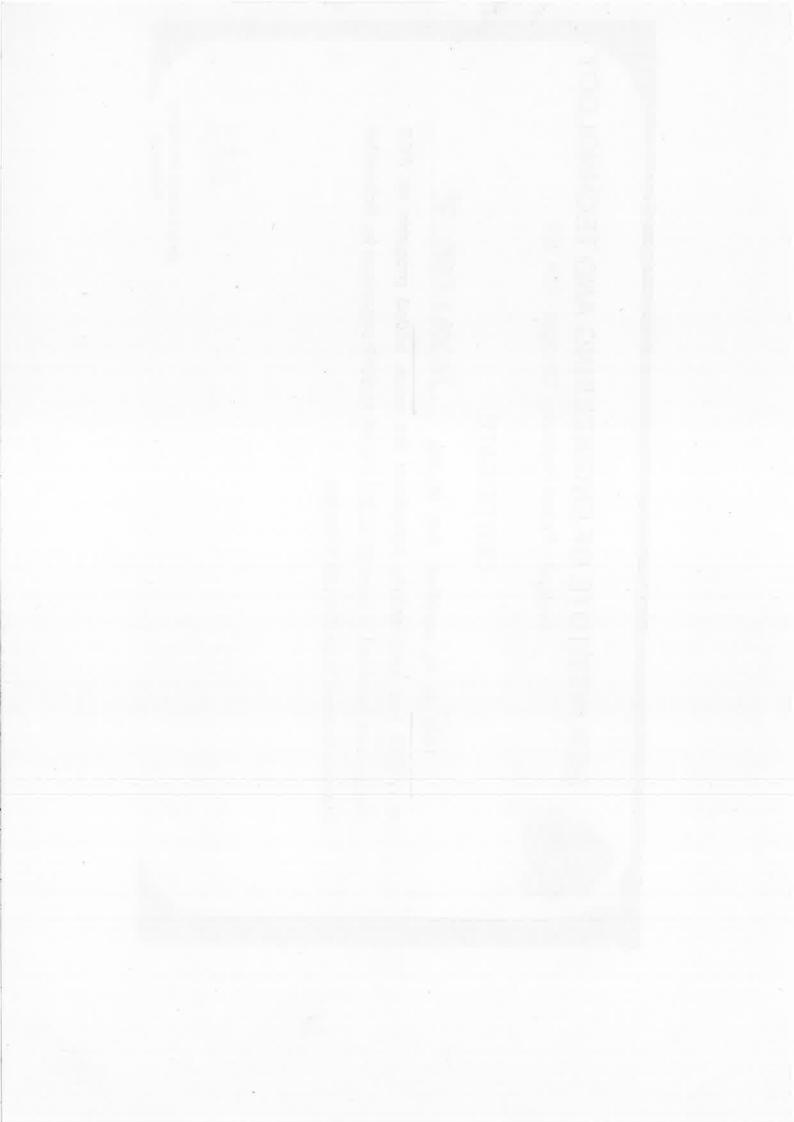




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CERTIFICATE

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





CERTIFICATE

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 This is to certified that Mr./Ms. Electric System India Pvt. Ltd, Chennai.

