

SSM INSTITUTE OF ENGINEERING AND TECHNOLOGY

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

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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.

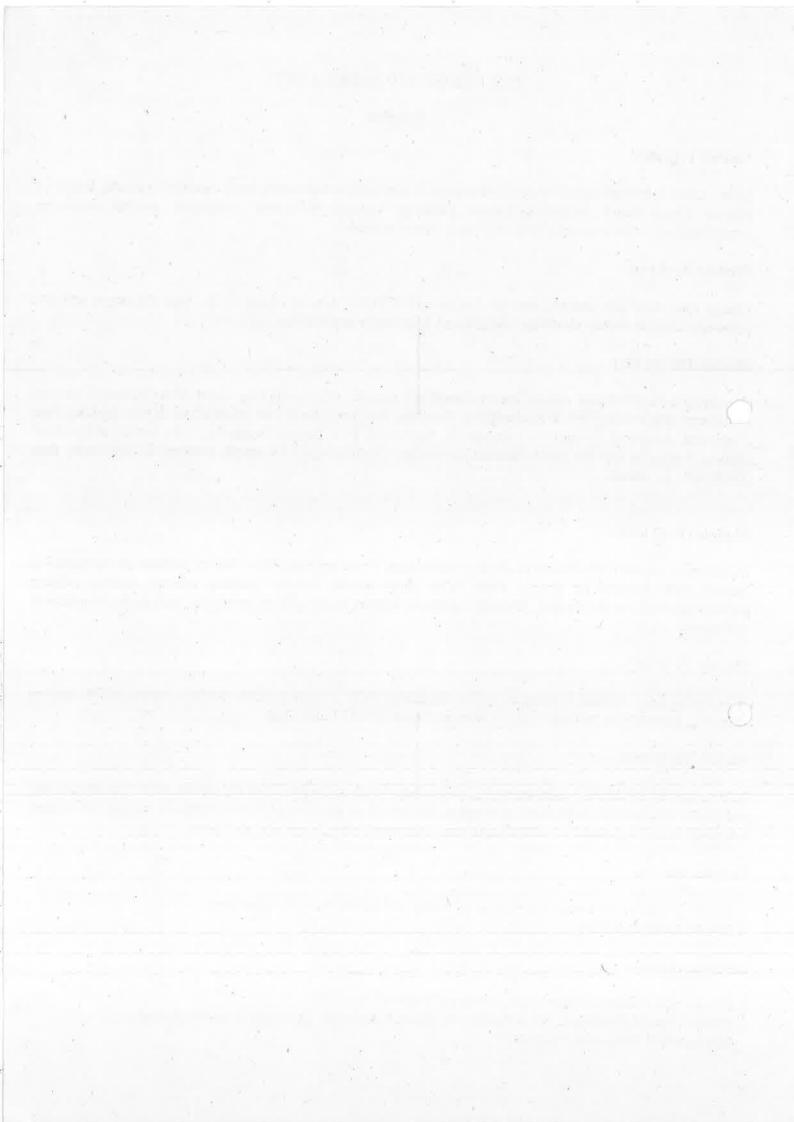
Text Books:

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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60	922115105701	CYRIL VALAN.J

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Dindigul-Palani Highway, Dindigul-624002

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HANDS ON TRAINING ON PCB DESIGN AND MANUFACTURING

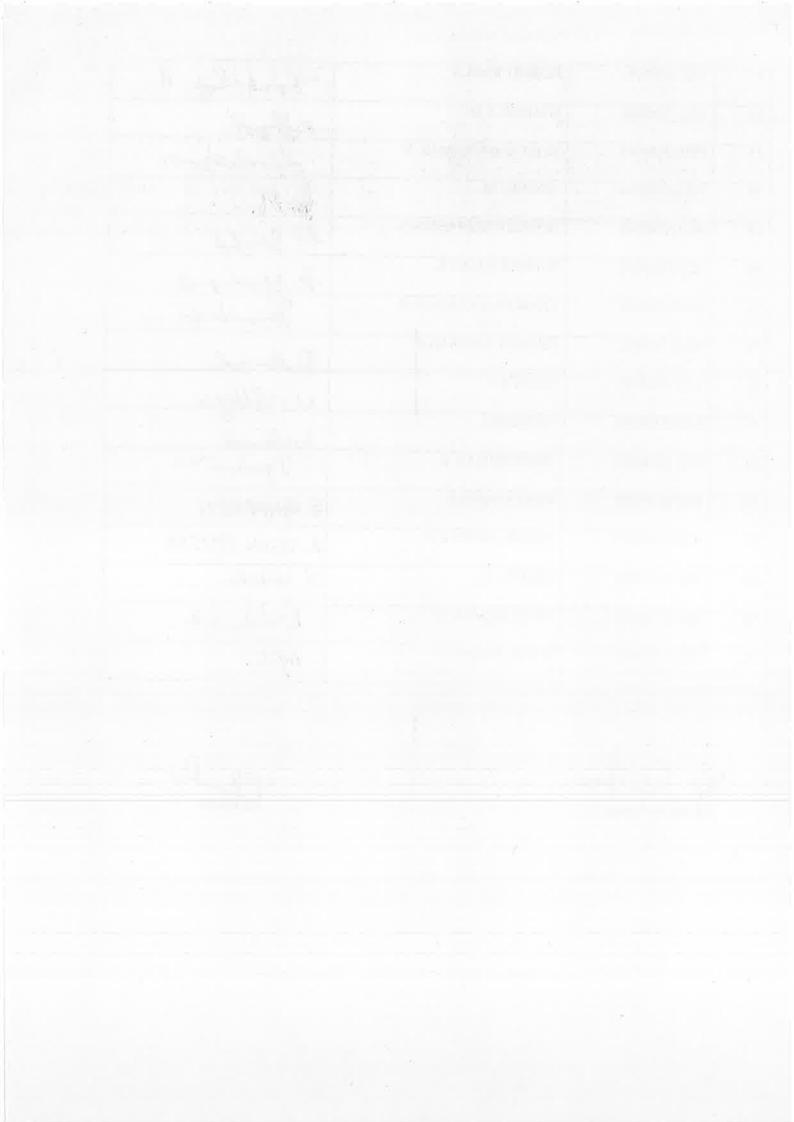
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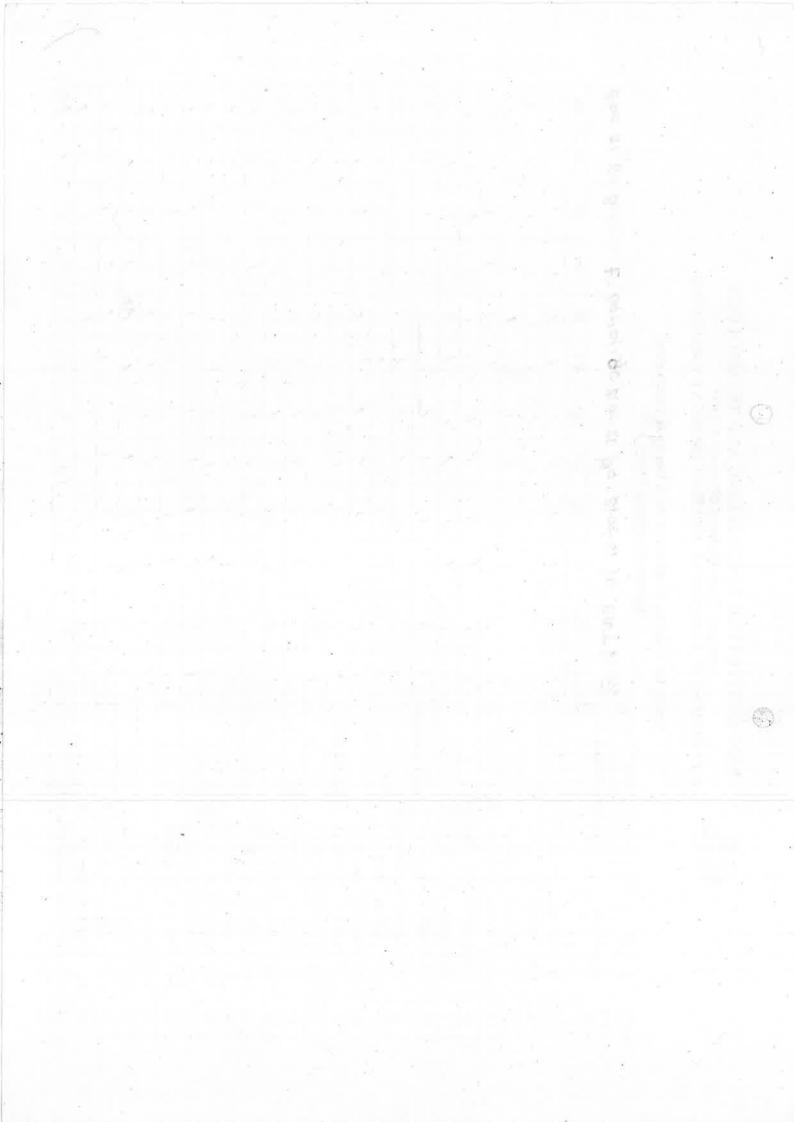


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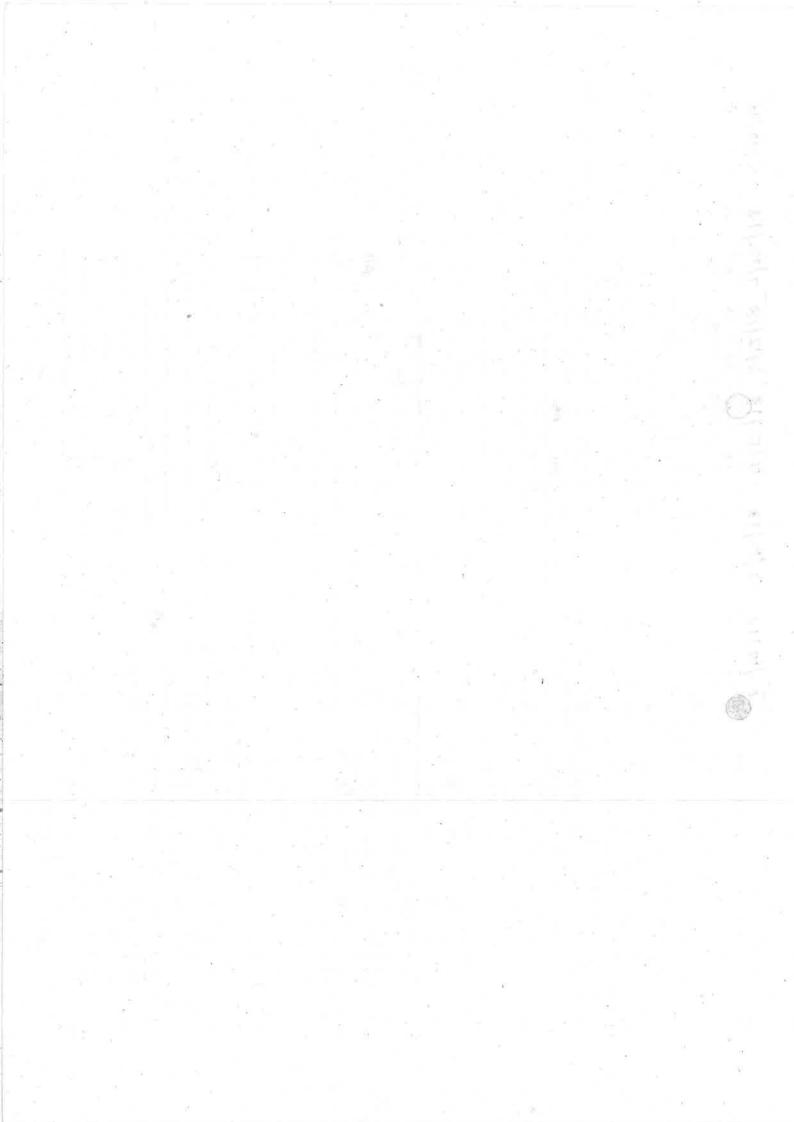
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

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

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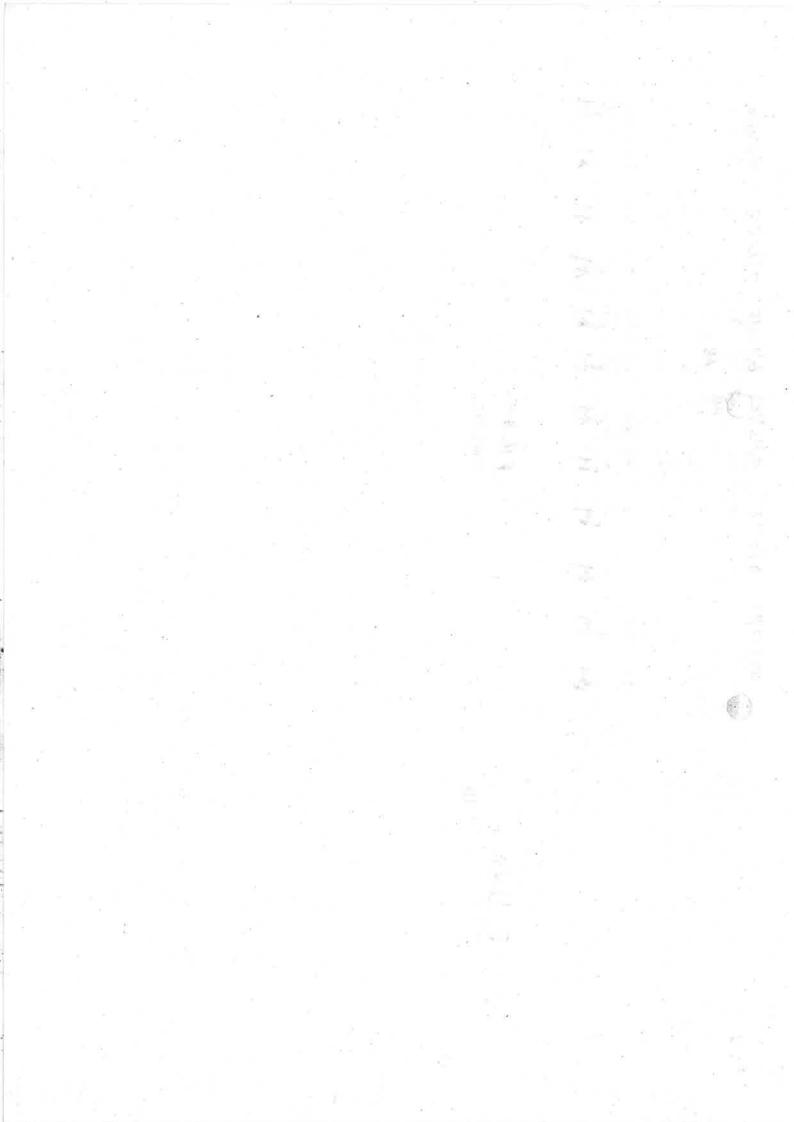
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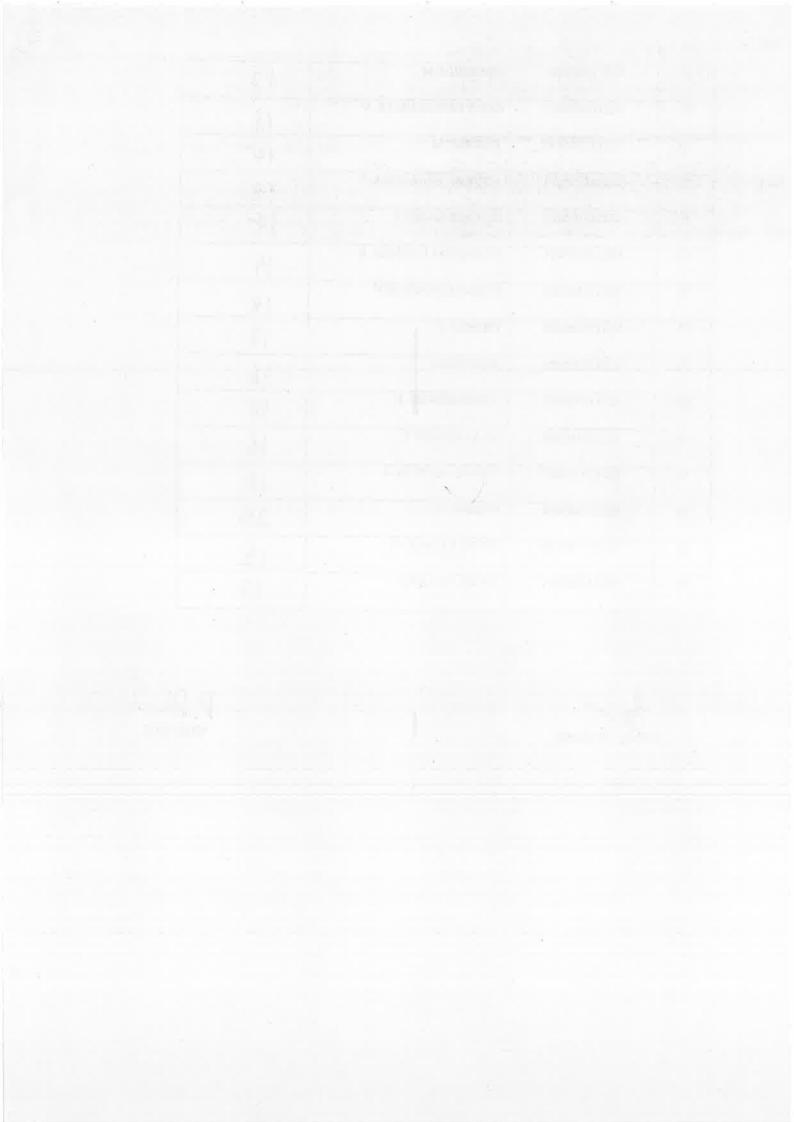
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60	922115105701	CYRIL VALAN.]	17

Faculty In-charge

P. Dr.





RegNo: 922+15105058

Max. Marks: 20 Marks

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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)

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: 922)15/05/023

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
- 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) $Z_{odd} \ge 0.8 Z_{even}$ $Z_{odd} = Z_{even}$

		in photo-sensitive polymer by	supporting photographic
pattern of single trac	es or IC pads for etching?	W	
a) Prepreg		st	
Let Eiching		•	
c) Photo-resist			
4) Solder mask			
12 11/1:1-1-1:1			
. /	are about to occur if PCB	is not designed properly in a c	confined manner for digital
circuits?			
Diffraction			
B. Refraction	11 37 1		
C. Ground & Supply			
D. Electromagnetic l	nterference		
A & B		2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
b) B & C			
-e) C & D			
d) A, B, C, D			
. 14. Which among the	e following assists in obta	ining the desired value of wav	e impedance in reflection phase
while designing digi		3	
A. Width of signal li			
100	signal line and ground lin	ne .	
C. Signal Delays	2.B		
D. Double Pulsing		T	
a) A & B			
(b) B & C			
c) C & D			
A, B, C, D			
15 What should be t	he resistance of 0.6 mm v	vide conductor with 15 cm leng	oth and 25 um thickness of
	(Assume $\rho = 1.7241 \times 10^{-6}$		Sar and 25 pair interaces of
a) 118.2 mΩ	(A35,dillo p 1.7241 X 10	(at 20°C)	
b) 138.2 mΩ			
c) 172.4 m Ω			
d) 192.4 m Ω		*	
d) 192.4 msz			
W. The natual cost of	f DCD can be evaluated or	n the basis of	#
4	f PCB can be evaluated or	i the basis of	
a) PCB size & mater	181		
b) Number of layers			
et Vias on PCB d) All of the above			
(1) All Of the above			
a) An or 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

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a) Prepreg
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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

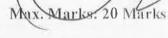
SSM INSTITUTE OF ENGINEERING AND TECHNOLOGY

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

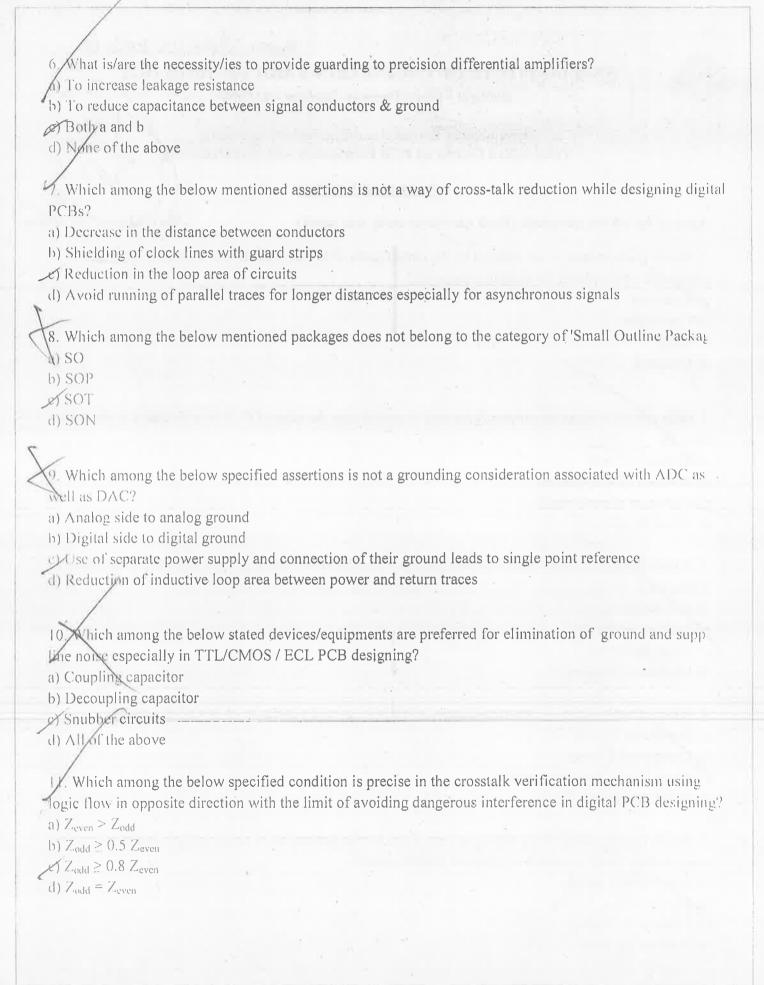
- d) Crosstalk
- 2. High current circuits are purposely located or placed near the edge of PCB in accordance to the supply

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
- 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	
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c) Photo-resist	
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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	
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c) Vias on PCB	
d) All of the above	

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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		Rating					
S.No	Criteria	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.

		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	* • · · ·	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

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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: $\sqrt{1} - \sqrt{1}$

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	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

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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: 1/1 - VII Date: 07. 12.18

Dear Student,

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ne La	S.No Criteria	Rating					
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1	Course content	· V				ā1	
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4	Regularity and punctuality of trainer		_		· ·	= = :1	
5	Coverage of syllabus	✓			13 C	1	
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					
S.No	Criteria	Excellent	Very good	Good	Fair	Satisfactory	
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3	Motivation	2:	1	1			
4	Regularity and punctuality of trainer		>	7			
5	Coverage of syllabus					* ×	
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Feel free to give QUALITATIVE comments too

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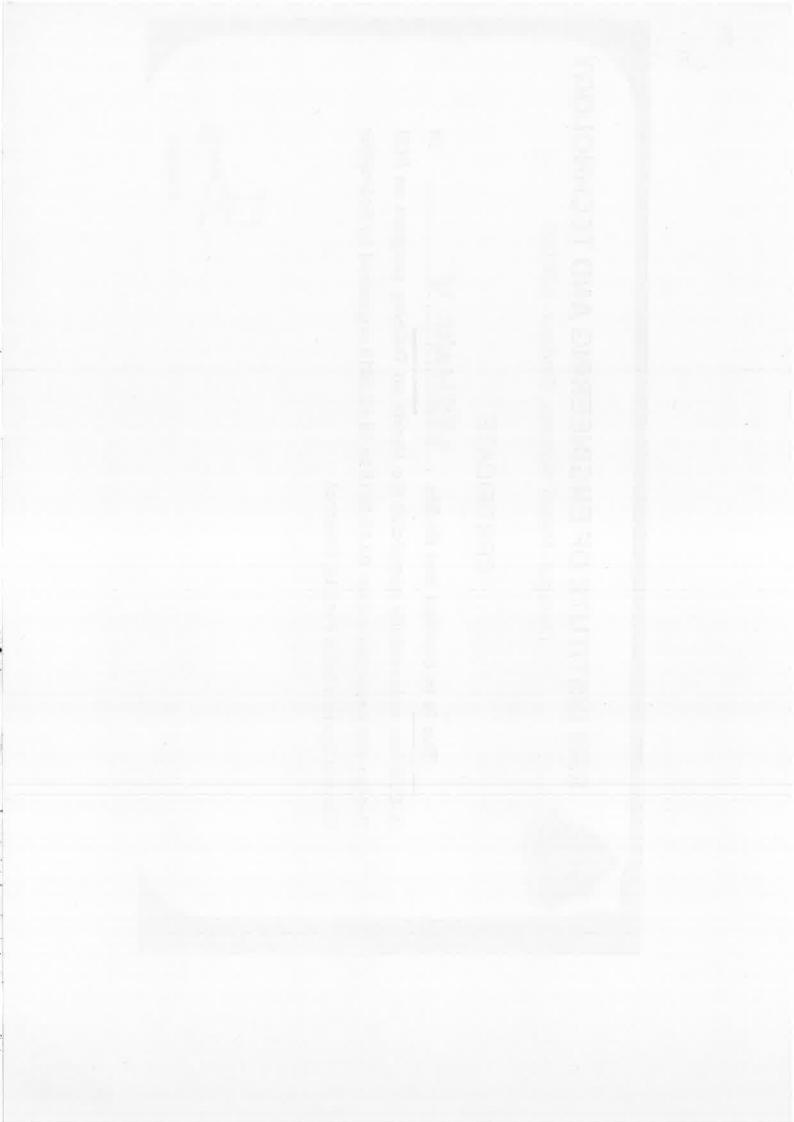


Dindigul - Palani Highway, Dindigul - 624 002

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.





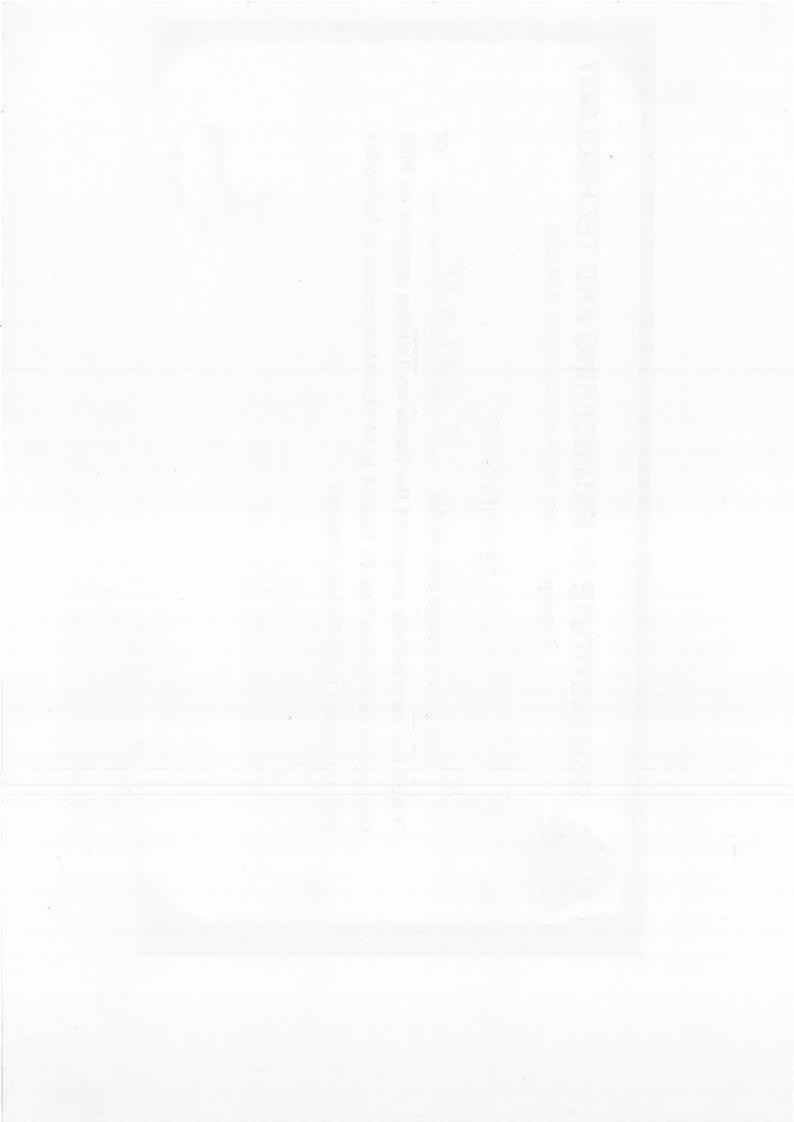


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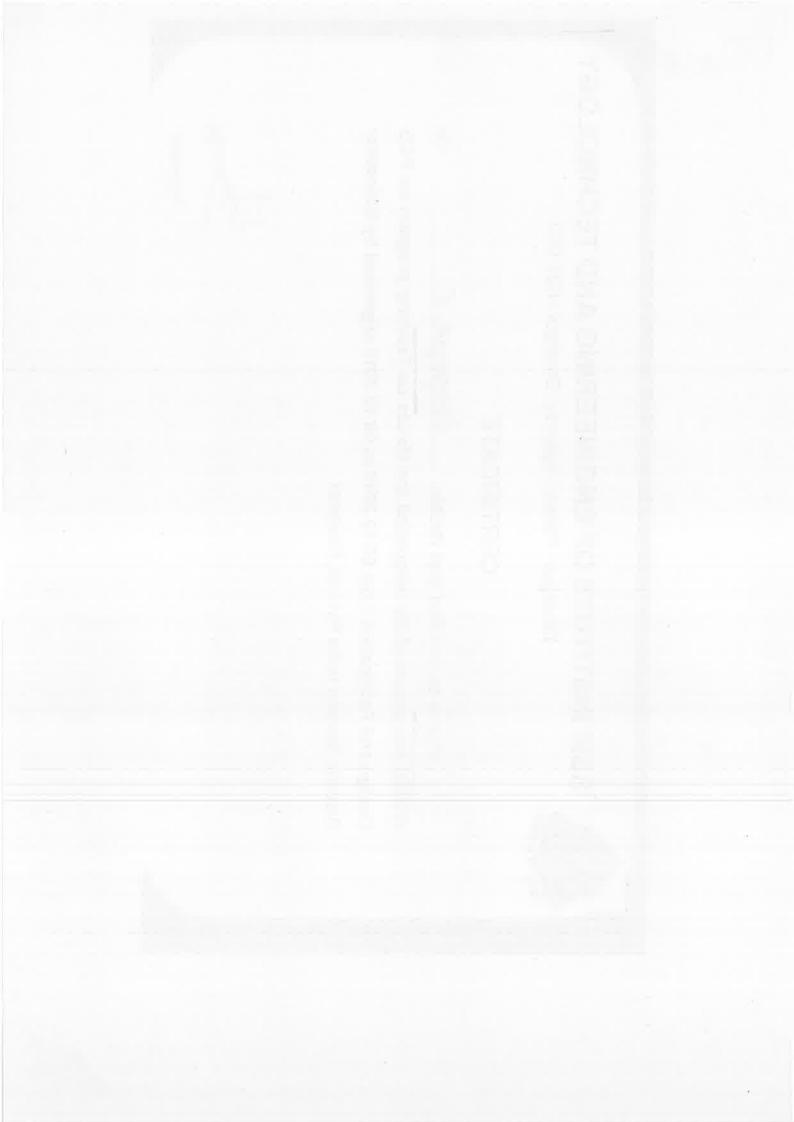


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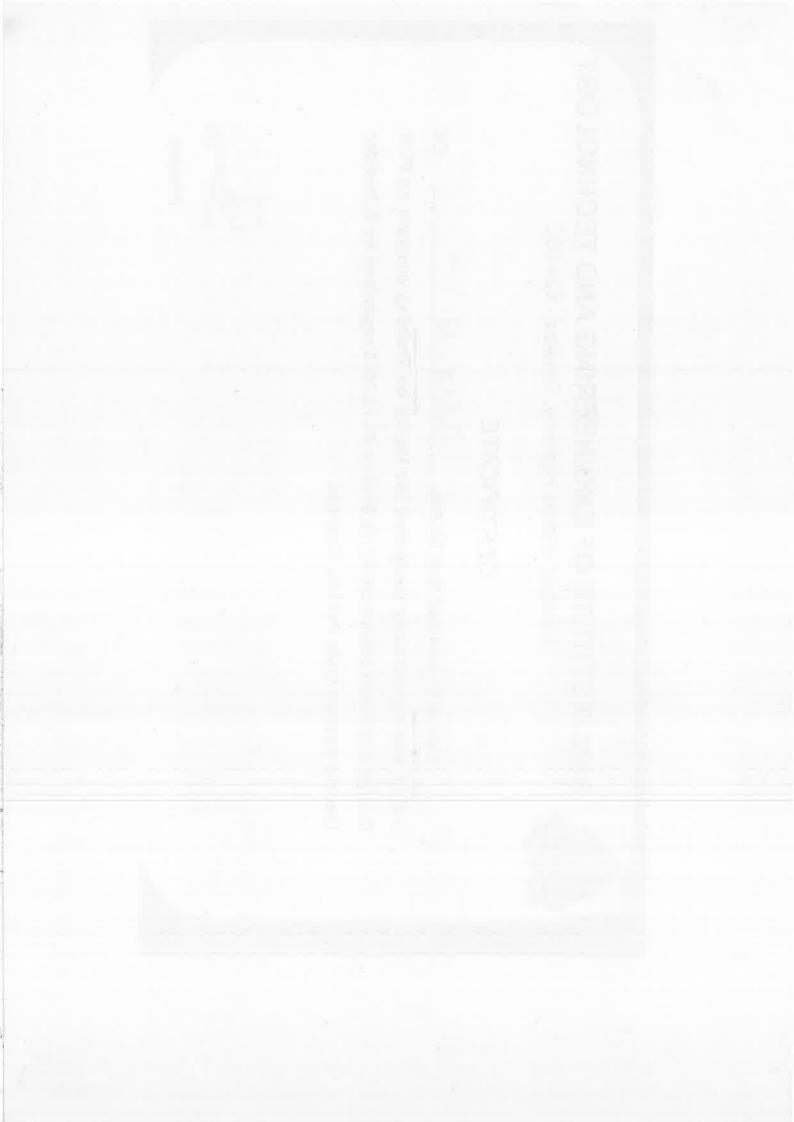


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