UNIVERSITY COLLEGE TATI

UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: DEI 2032
COURSE	: CIRCUIT DESIGN
SEMESTER/SESSION	: 1-2023/2024
DURATION	: 3 HOURS

Instructions:

1. This booklet contains 4 questions. Answer **ALL** questions.
2. All answers should be written in answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise up your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 6 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

a) List FOUR (4) advantages of using CAD systems to designing and simulation electronics circuits. (4 marks)

b) List THREE (3) schematic software. (3 marks)

c) Identify the best TWO (2) schematic software package. (2 marks)

d) Identify the best TWO (2) PCB layout software package. (2 marks)

e) Refer to Figure 1.

i. Sketch the schematic circuit from the PCB. (10 marks)

ii. List the Bill of Material (BOM) complete with type of package. (4 marks)

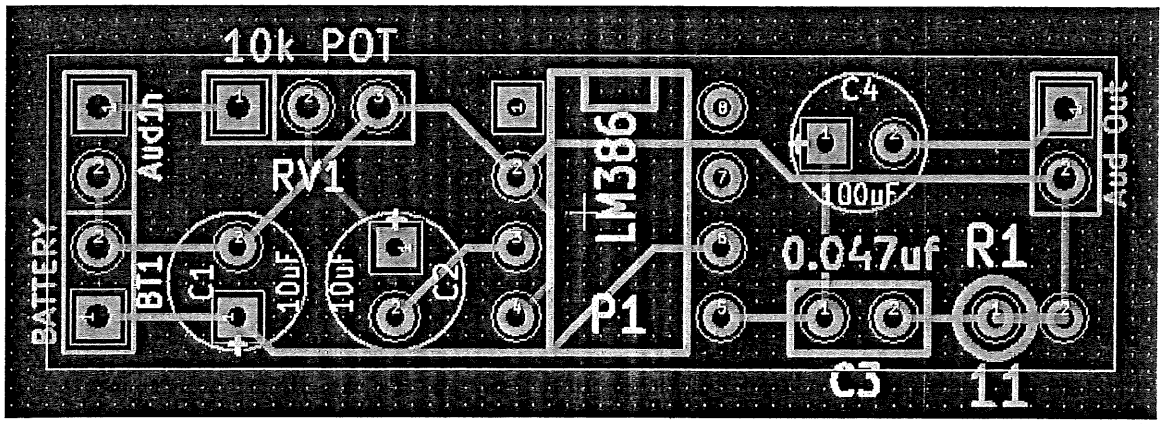


Figure 1

QUESTION 2

a) State the difference between analog circuits and digital circuits. (2 marks)

b) Printed circuit boards were assembled using both surface mount and through-hole processes. Describe the differences between these two mounting approaches. (4 marks)

c) Describe the difference between a schematic diagram and a PCB layout. (6 marks)

d) Explain the requirement for designing a circuit board. (6 marks)

e) Explain the function of netlist in the PCB design layout. (7 marks)

QUESTION 3

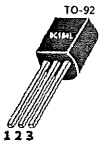
a) Describe the process of multilayer PCB fabrication. (4 marks)

b) Describe the proses of photolithography in designing PCB layout. (5 marks)

c) Explain the process of PCB auto-routing work using Proteus. (6 marks)

d) By referring to the PCB diagram given in Figure 2, construct the schematic circuit according to the PCB diagram connection. (10 marks)

Given component are as follows:

Component Designation	Component Value	Package
Q1	TIP31	TO-220 
Q2	BC184	TO-92 
U1	CA3140	DIP-8 
C1, C2	0.1uF, 47pF	CAP-10 
R1, R2, R3	10 kΩ, 1 kΩ, 2.2 kΩ	RES40 
D1	1N4001	DO-41 

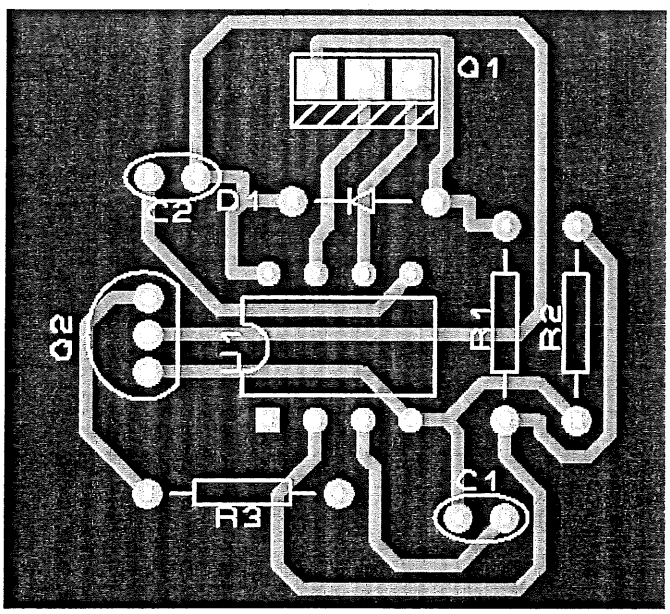


Figure 2

QUESTION 4

a) List FOUR **(4)** types of layers in printed circuit boards. (4 marks)

b) Identify the type of chemical and concentration used in a PCB etching process. (2 marks)

c) Prepare the basic materials required to prepare a basic PCB at home. (6 marks)

d) Produce the process designing PCB using engraver machine. (6 marks)

e) Produce the techniques used in PCB Fabrication Process. (8 marks)

----------End of question----------