



UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET

COURSE CODE	: DEI 2032
COURSE	: CIRCUIT DESIGN
SEMESTER/SESSION	: 1-2022/2023
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 the advantage and disadvantage of using CAD systems to designing and simulation electronics circuits. (2 marks)
- b) State the most important things and details regarding PCB layout. (2 marks)
- c) Identify the best FOUR (4) schematic + PCB layout software package. (4 marks)
- d) 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. (7 marks)

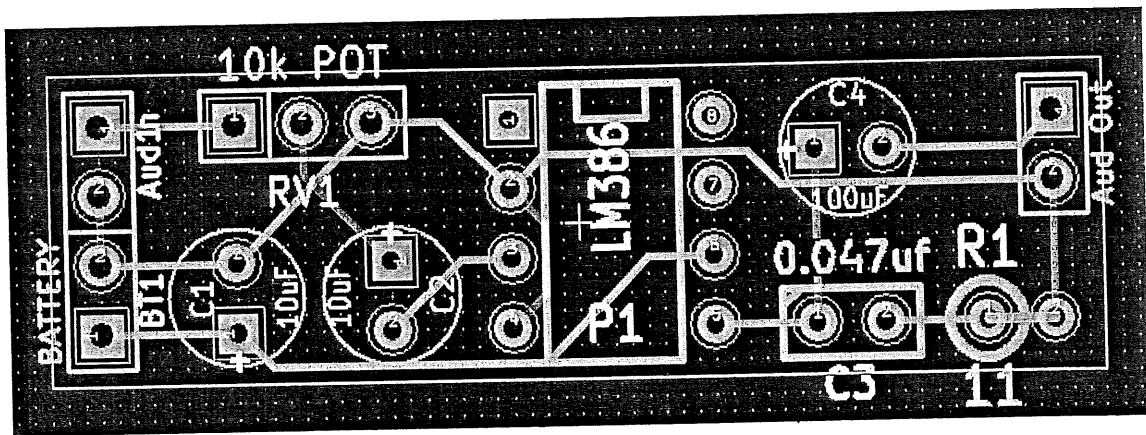


Figure 1

**QUESTION 2**







- a) Recognize 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) Produce a method of designing a PCB when the components used in the design are not available in PCB designing tools such as Proteus. (7 marks)

## CIRCUIT DESIGN (DEI2032)

## QUESTION 3

- a) Describe the process of multilayer PCB fabrication. (2 marks)
- b) Explain the purpose of photolithography serve in the integrated circuit manufacturing process. (5 marks)
- c) Show a PCB assembly process work. (5 marks)
- d) By referring to the PCB diagram given in Figure 2, construct the schematic circuit according to the PCB diagram connection. (13 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 

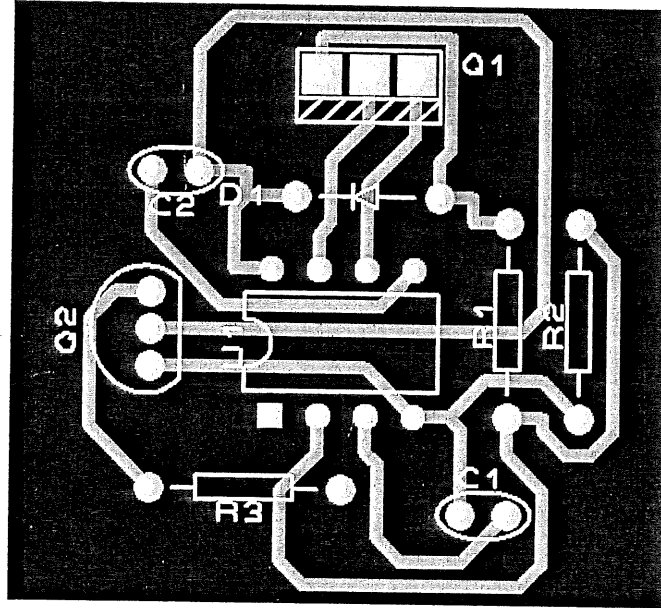


Figure 2

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**QUESTION 4**

- a) State **TWO (2)** small holes and describe its function in printed circuit boards. (3 marks)
- b) Identify the type of chemical and concentration used in a PCB etching process. (6 marks)
- c) Prepare the basic materials required to prepare a basic PCB at home. (6 marks)
- d) Produce the process and significance of PCB Assembly. (6 marks)
- e) Produce the techniques used in PCB Fabrication Process. (4 marks)

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