



Examination Answer Books

12 Pages

Instructions to Candidates

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right, fold over and seal down (using the label provided) to hide your name.
3. The answers must be legibly written. The Examiners can either ignore illegible script or have it typed and the expense of typing charged to the candidate.
4. Write your answers in ink.
5. Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. **Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.**

1	Student Number	2400571
2	Title of Examination Paper	~~AC~~ Electronics 1
3	Module Code	ACDAB 5002
4	Date and Time of Examination	16/01/2026 10:00 to 12:00
5	Examination Venue	IQ 208
6	Seat Number	
7	Number of Answer Books handed in	1

List the numbers of the questions you have attempted	Office Use
(i)	20
(ii)	10
(iii)	19
(iv)	20
(v)	15
(vi)	10
Total	94/100

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20/01/26
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H.C.

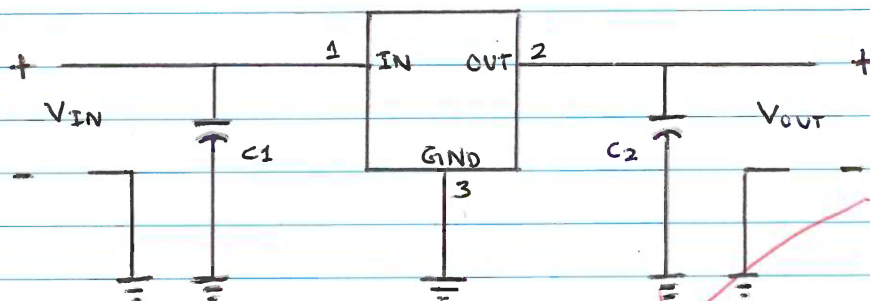
v) a)

The $33k\Omega$ fixed resistor and photoresistor (LDR) form a voltage divider connected to the inverting input of the LM393 comparator. The $10k\Omega$ potentiometer sets an adjustable reference voltage at the non-inverting input of the comparator.

In bright conditions, the LDR has low resistance, producing a ~~low voltage~~ lower voltage at the inverting input than the non-inverting input, $V_- < V_+$, so the LED turns off.

In dark conditions, the LDR has high resistance, producing a higher voltage at the inverting input than the non-inverting input, $V_- > V_+$, so the LED turns on.

b)



The unregulated input voltage V_{IN} , in this ^{case} 12V, is filtered by capacitor C_1 and enters the IC's 'IN' pin. The regulated output voltage, ^{in this case 5V}, leaves the IC through the 'OUT' pin and is filtered by capacitor C_2 . The third pin of the IC, 'GND', is connected to ground.

vi)

RS: It is the Register Select pin. It selects between the instruction register and data register. $RS = 0$ for instruction register and $RS = 1$ for data register.

RW: It is the Read/Write pin. It controls the direction of data. $RW = 0$ for write operations. & $RW = 1$ for read operations.

D0-D7: They are data pins. In this case, because it is a 4-bit mode, D4-D7 are used. They are used to ~~send~~ send data/instructions to the LCD.

VSS: It is the ground pin of the LCD.

VDD: ~~Supply~~ Supply voltage pin of the LCD connected to the +5V power supply.

VEE: Contrast adjustment pin to adjust LCD's display contrast.

E: Enable pin. It must be toggled each time data/instruction is sent.

Marks from the screenshots

- (i) $\frac{20}{20}$
 (ii) $\frac{10}{10}$
 (iii) $\frac{19}{20}$
 (iv) $\frac{20}{20}$
 (v) $\frac{20}{20}$
 (vi) $\frac{20}{20}$

$\frac{10}{10}$

