

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.**

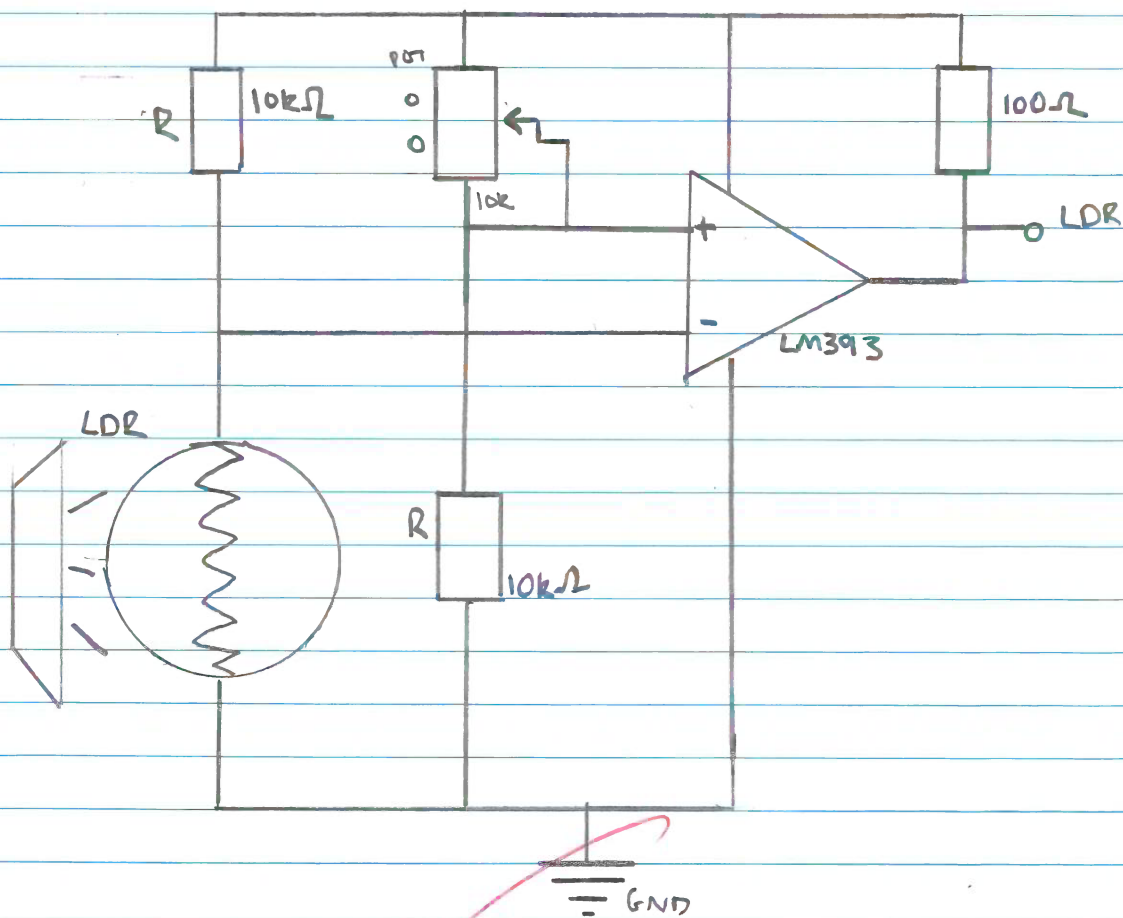
1	Student Number	2316329
2	Title of Examination Paper	Electronics 1
3	Module Code	ACDB5002
4	Date and Time of Examination	16/1/2026
5	Examination Venue	1A208
6	Seat Number	N/A
7	Number of Answer Books handed in	1

[illegible]

$\frac{89}{100}$

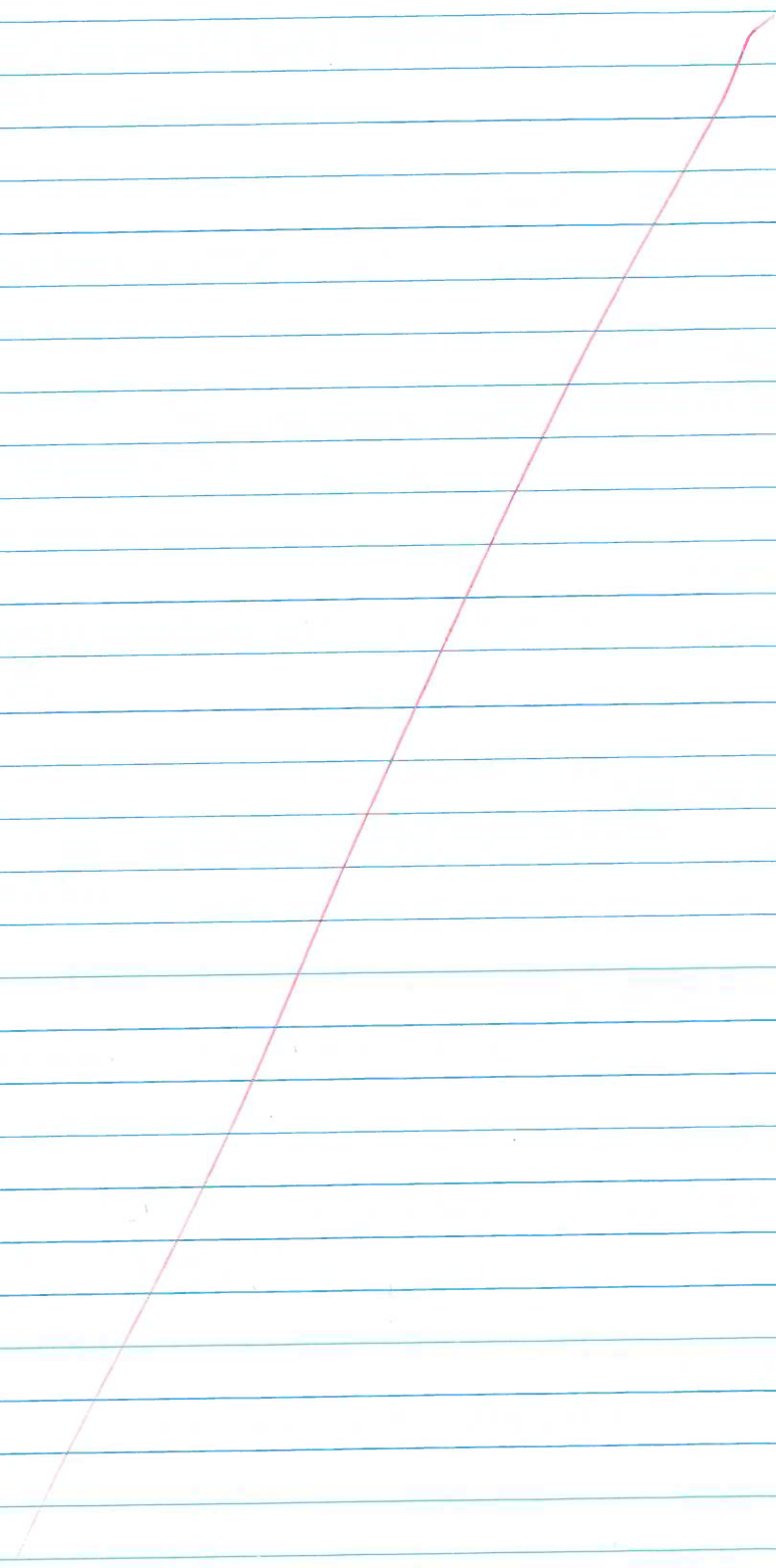
$$\begin{array}{r} 121 \\ 20 \overline{) 1126} \end{array}$$

v) Drawing for v) a. Night Light Sensor Circuit.





Question No.



v)

- a) The night light sensor works by illuminating an LED when there is no light or a low light level. It utilises a low power, single-supply differential comparator to compare 2 dissimilar terminals. The dissimilarity will be proportional to voltage quantity.

2

If the voltage of the first terminal is greater than the voltage of the second terminal, the LED will switch ON.

2

If the voltage of the first terminal is less than the voltage of the second terminal, the LED will switch OFF.

2

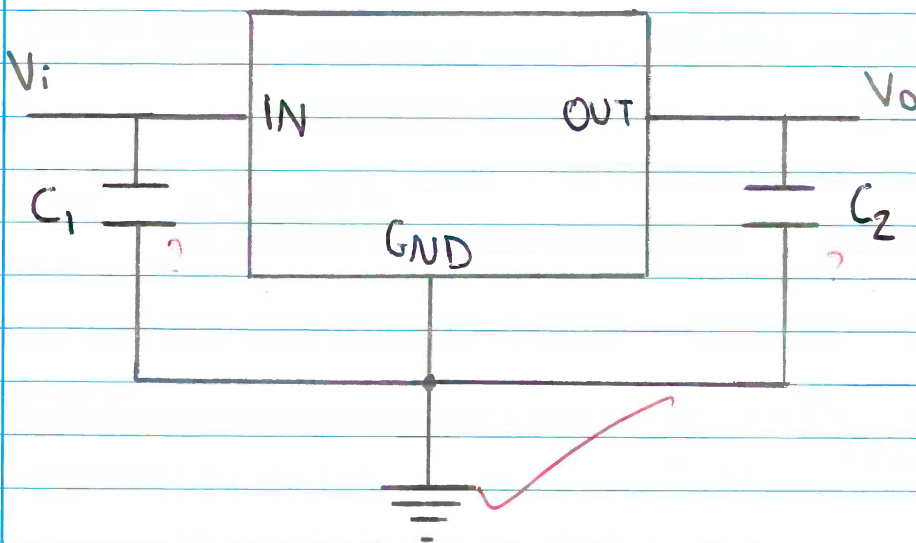
Circuit has been drawn on page 1 of answer booklet

(6)

- b) The voltage regulator has 3 terminals. The first terminal will have an unregulated input voltage (V_i), which is filtered by capacitor C_1 . The second terminal has a regulated output voltage, based on the model (e.g. 7805 will give +5V). This voltage is filtered by capacitor C_2 . The third terminal of the voltage regulator is then connected to ground (GND).

3

1



2 1/2

6 1/2

12 1/2
20

Question No.

vi)

RS stands for Register Select and it selects between instruction register (when $RS=0$) and data register (when $RS=1$). It decides whether the input is command or display data.

RW stands for Read/Write and it controls the direction of data. $RW=0$ for a write instruction, where data goes from MCU to LCD. $RW=1$ for a read instruction, where data goes from LCD to MCU.

E stands for Enable and it acts as a latch. On a high to low pulse, the LCD will read data from the data lines. It also must be toggled each time data / a command is sent.

D0-D7 are the data pins used to transfer data. In terms of 4-bit mode, data is sent in 2 parts and only 4 pins are used (D4 to D7). This leads to slower data transfer but uses less pins, is more pin use efficient as it uses less pins. On the other hand, 8-bit mode is where all 8 bits are sent at once, leading to faster and more efficient data transfer.

VSS is used to identify the circuit's ground (GND).

VDD is used to identify the circuit's positive power supply terminal.

VEE is used to adjust the display's contrast.

from screen shots

- (i) 19
- (ii) 10
- (iii) $17\frac{1}{2}$
- (iv) 20

