

12 Pages

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	2315904
2	Title of Examination Paper	ELECTRONICS 1
3	Module Code	ACOB5002
4	Date and Time of Examination	16/01/26 10.00 AM
5	Examination Venue	IQ 208
6	Seat Number	~~A11A~~ COMPUTER 6.
7	Number of Answer Books handed in	1

[illegible]

(Gweler yr ochr arall am y fersiwn Cymraeg)

Examiner Only

712 DATA IS SENT

—E

1 LCD.

PL f
22/01/26

78

155

- vi) 1. ~~RS~~ - REGISTER SELECT - SELECTS THE REGISTER DATA IS SENT TO
- $RS = 0$: INSTRUCTION REGISTER; FOR COMMANDS LIKE ~~CLR~~ CLEAR DISPLAY.
- $RS = 1$: DATA REGISTER; CHARACTER DATA TO DISPLAY ON LCD.
2. RW: READ/WRITE; CHOOSES OPERATION MODE
- $RW = 0$; WRITE; DISPLAY TO THE LCD
- $RW = 1$; READ; READ FROM LCD.
3. E: ENABLE PIN; ACTS AS LATCH SIGNAL.
- WHEN DATA IS READY ON BUS, A HIGH TO LOW SIGNAL ON E INSTRUCTS LCD TO RECEIVE DATA.
- MUST BE TOGGLED FOR EACH DATA BIT SENT
4. D0-D7: DATA LINES. - SEND DATA TO LCD.
- 8-BIT MODE: ALL 8 LINES ARE USED
- 4-BIT MODE: ONLY D4-D7 USED. DATA SENT IN TWO NIBBLES.
- TRANSMITS INSTRUCTIONS WHEN $RS=0$, DATA WHEN $RS=1$.
5. VSS; GROUND PIN (0V REFERENCE)
6. VDD; SUPPLY PIN FOR LCD (TYPICALLY +5V).
7. VEE; CONTROLS LCD CONTRAST - USUALLY CONNECTED TO POTENTIOMETER TO CONTROL VOLTAGE.

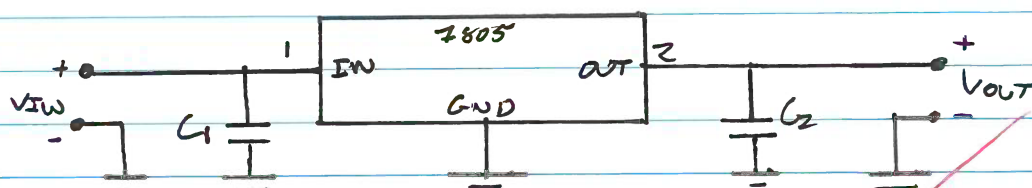
10/10

10

V.

b) Voltage Regulator.

THE VOLTAGE REGULATOR IS A THREE TERMINAL DEVICE THAT HAS AN UNREGULATED DC INPUT VOLTAGE APPLIED TO THE INPUT, AND PROVIDES A REGULATED DC OUTPUT VOLTAGE ON THE OUTPUT PIN. A THIRD PIN IS CONNECTED TO GROUND.



→ FIXED POSITIVE VOLTAGE REGULATOR

THE 78XX SERIES VOLTAGE REGULATOR HAS AN INPUTED UNREGULATED VOLTAGE, AND OUTPUTS A FIXED POSITIVE OUTPUT VOLTAGE, THAT IS REGULATED.

AN UNREGULATED VOLTAGE, V_{IN} , IS FILTERED BY CAPACITOR C_1 AND ~~APPLIED~~ APPLIED TO THE IN PIN. A FIXED - POSITIVE OUTPUT VOLTAGE IS PRODUCED ON THE OUT PIN AND IS FILTERED BY CAPACITOR C_2 .

→ FIXED NEGATIVE VOLTAGE REGULATOR.

THE 79XX SERIES VOLTAGE REGULATOR HAS AN ~~UNREG~~ UNREGULATED INPUT VOLTAGE, AND PRODUCES A FIXED NEGATIVE, REGULATED OUTPUT VOLTAGE.

V_a) A NIGHT LIGHT SENSOR IS USED TO DETECT LUMINOSITY

- WHEN THE LDR SEES LIGHT THE LM393 VOLTAGE COMPARATOR SWITCHES OFF, DISABLING THE CIRCUIT

- WHEN THE LDR SEES LIGHT THE LM393 COMPARATOR ACTIVATES ILLUMINATING THE LED.

WHEN $V_1 > V_2$ LED IS ON

WHEN $V_1 < V_2$ LED IS OFF.

LDRS CAN BE USE TO DETECT LIGHT, MEASURE LUMINOSITY, AND CONVERT LIGHT TO POWER.

Marks from
Screenshots

- (i) $\frac{19}{20}$
- (ii) $\frac{8}{10}$
- (iii) $\frac{18}{20}$
- (iv) $\frac{11}{20}$
- (v) $\frac{12}{20}$
- (vi) $\frac{10}{10}$