

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	1603324/1
2	Title of Examination Paper	Electrical and Electronic HND
3	Module Code	M4X00370
4	Date and Time of Examination	9 th May 2018
5	Examination Venue	Main Hall Ty Cook
6	Seat Number	8
7	Number of Answer Books handed in	

[illegible]

(Gweler yr ochr arall am y fersiwn Cymraeg)

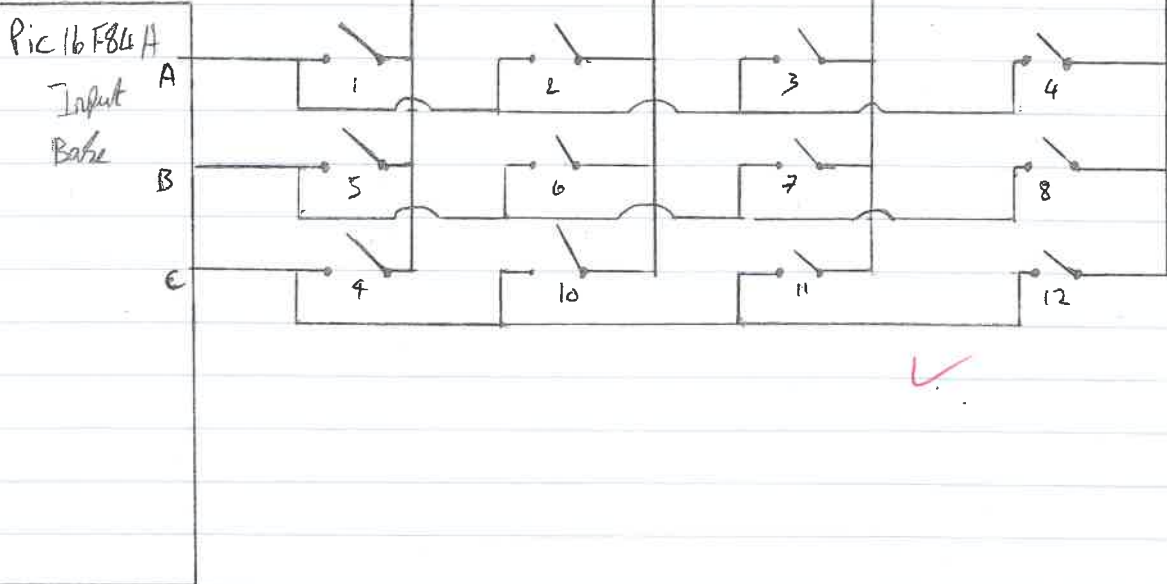
Complete, fold and seal
(see note 2 below)

SURNAME: Link

FORENAME(S): Connor

5

A)



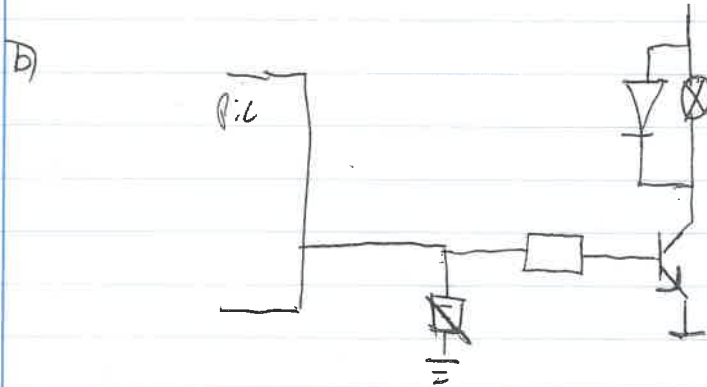
3.✓

✓

- B) the switches are scanned constantly by the circuit programming whilst constantly being fired with 5V from the output pins. When a switch is made it is able to identify the switch by seeing the output connection going down in voltage, this is then read by the input base of the PIC.
- For example if switch 3 was fired then output connection (3) would dip in voltage and input Base A would increase in voltage

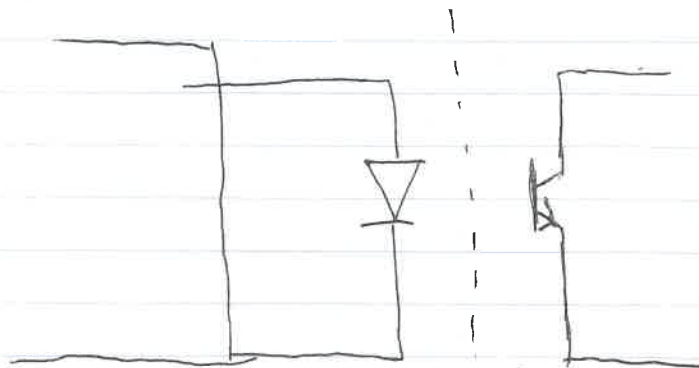
3.✓

- 3) a) It's not possible to connect a ac load directly into a Pic 16F84a to the output because they are not compatible with ac outputs and would become damaged ✓



- c) When reading Switched inputs on a pic, there can be an effect known as Bounce from the actual switch changing, this would cause false reading as it read 1 with the switch closed but as it bounces off briefly it would read a 0, this would only happen very briefly but with the pic reading this all the time it can cause false readings. It can be countered by using a Diode this will remove the bounce effect. ✓

- d) To connect a switch that is to be electrically isolated from the Pic, you would either use an opto-isolator or a galvanic barrier, these are commonly used in intrinsically safe circuits



light given from the Diode will cause the opto isolator to change state and make a current ✓

- 2) a) The use of Subroutines in controllers is for being able to allow for programming within the circuit so for example being able to input a times into a sequence within a programme or being able to change the input and output connections by reversing them. This could even be clearing the registers to start the programme over when booting up, This can be from code such as ~~MOV~~ or ~~MOV~~ or ~~CALL~~
- b) The use of interrupts in programming is extremely useful. They are used for emergency interruptions of a routine for example a large machine having a fault and an emergency stop being pressed would be part of the interrupt sequence that would jump the ~~processor~~ queue in the routine and call all operations to shut down
- c) The use of the stack is for the programme to remember its last location just before a sub-routine or interrupt sequence starts, it is so that when the sub-routine is completed it can continue from its previous location in the programme without starting from scratch.
- d) once a interrupt programme was complete the actual coding would use a RETFIE command so it would return from the Interrupt

2 ✓

1 ✓

2 ✓

1 ✓