

Mark Scheme (Results) Summer 2008

GCSE

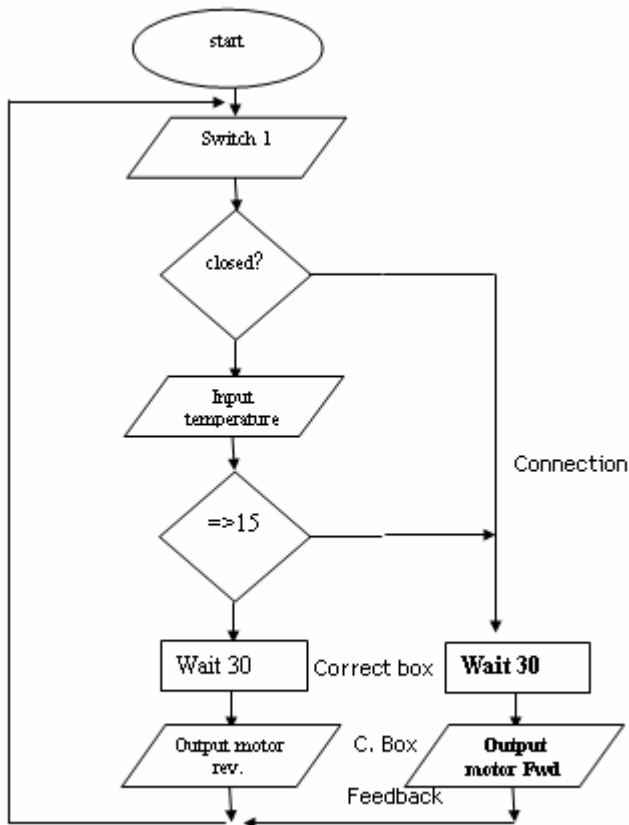
GCSE Design & Technology: Systems & Control Technology (3974) Paper 2H

1 (b)(i)	<p>Two reasons given:</p> <ul style="list-style-type: none"> • Light (1) • Rigid (1) • Does not rust (1) • Non-magnetic (1) • Easily shaped / die caste (1) • Easy to recycle (1) <p style="text-align: right;">(2 x 1)</p>	(2)
1 (b)(ii)	<p>Two reasons given:</p> <ul style="list-style-type: none"> • The bracket can be the same colour as the case (1) • It is a low temperature process (1) • Plastic layer protects - sharp edges - scraping ceiling (1) • It is a self finishing process (1) <p style="text-align: right;">(2 x 1)</p>	(2)
1 (c)	<p>Two properties given with two reasons:</p> <p>Property: Good conductor of electricity Reason: Small power loss</p> <p>Property: Is malleable Reason: Easy to produce/ can bend without breaking</p> <p>Property: Not magnetic Reason: Will not be affected by electro-magnetic devices</p> <p>Property: Does not corrode easily Reason: Long component life/ long product durability</p> <p>Property: Ductile Reason: Can be drawn into a wire</p> <p>Property: Low temperature coefficient Reason: Allows components to be soldered to it</p> <p style="text-align: right;">(2 x 1) (2 x 1)</p>	(4)
1 (d)	<p>Two electronic quality control checks named:</p> <ul style="list-style-type: none"> • Detection to activation time/working check (1) • Test button function ease (1) • PCB continuity check (1) • Battery to PCB check (1) • LED function check (1) • Speaker/buzzer loudness check (1) <p style="text-align: right;">(2 x 1)</p>	(2)

Question Number	Answer	Mark
2 (a)(i)	<p>One gate named:</p> <ul style="list-style-type: none"> Nand <p><i>(Only acceptable answer)</i></p>	(1)
2 (a)(ii)	<p>One of the following:</p> <ul style="list-style-type: none"> Astables: 555 timer/PIC/Coupled transistors / logic gates / Op-amp 	(1)
2 (a)(iii)	<p>One of the following:</p> <ul style="list-style-type: none"> Transducer Driver: Transistor / Darlington pair/FET/Driver I/C / Op-amp 	(1)
2 (b)	<p>Two ways described:</p> <ul style="list-style-type: none"> A breadboard/prototype board could be used with real components Kits could be used with pre-made circuit blocks Veroboard / pinboard may be used with components soldered to them A computer program/Croc clips/Livewire may be used to simulate the system <p><i>(accept any named electronics program)</i></p> <p style="text-align: right;">(2 x 1) (2 x 1)</p>	(4)
2 (c)	<p>Four main stages given:</p> <ol style="list-style-type: none"> Expose / put into UV box (1) Develop / sodium dioxide / sodium hydroxide (1) Etch / ferric chloride / chemically remove copper (1) Drill holes (1) <p><i>(Only acceptable answers and must be in correct order)</i></p> <p style="text-align: right;">(4 x 1)</p>	(4)
Total for question		11

Question Number	Answer	Mark
3 (a) (i)	For one mark <ul style="list-style-type: none"> • 1v or • 0.5v • 0.05v • 0.005v For two marks <ul style="list-style-type: none"> • 5V 	(2)
3 (a)(ii)	One way explained: <ul style="list-style-type: none"> • The resistance of the thermistor goes down therefore the voltage across it is less • The potential difference between the thermistor and VR2 changes. 	(2)
3 (a)(iii)	The action explained: <ul style="list-style-type: none"> • The relay coil is operated therefore the contacts will switch <i>(only acceptable answer)</i>	(2)
3 (a)(iv)	The action stated: <ul style="list-style-type: none"> • It will reverse its direction/go backwards/go the other way (1) <i>(only acceptable answer)</i>	(1 x 1) (1)

3 (b)(i)



1 mark for connection
 1 mark for each correct box
 1 mark for feedback

(4)

Total for question

11

Total for paper

44