



**General Certificate of Secondary Education
2011**

Technology and Design

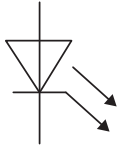
Unit 1:
Technology and Design Core

[GTD11]

WEDNESDAY 25 MAY, AFTERNOON

MARK SCHEME

1



Electronic
Pneumatic
3/2 valve
Hazard Sign
Decision or Compare
Thyristor
Mechanical
Knife Follower

[1]
[1]
[1]
[1]
[1]
[1]
[1]
[1]

AVAILABLE
MARKS

9

2 (a) Safety Equipment and Features

Any 3 suitable answers

- Simulation required for new programs before machining cycle can be commenced. Single block operation.
- Emergency stop button.
- Power on indicator lamp.
- Most modern CNC machines are designed so that the cutting tool will not start unless the guard is in position.
- Most CNC machines automatically lock the guard in position whilst the cutter is shaping material.
- The guard can only be opened if the cutter has stopped.

[3]

(b)

Any 2 suitable answers

- Suitable for batch or mass production.
- On a CNC machine it is possible to make hundreds or even thousands of the same items in a day.
- Uses design software, then it is processed by the computer and manufactured using the CNC machine linking CAD/CAM.
- This CNC machine can be used to machine woods, plastics and aluminium.
- A full 3D simulation of the manufacturing process, including a cycle time, can be shown enabling work to be proven without the need for trial runs on the machine.
- Part program can be stored for future use.

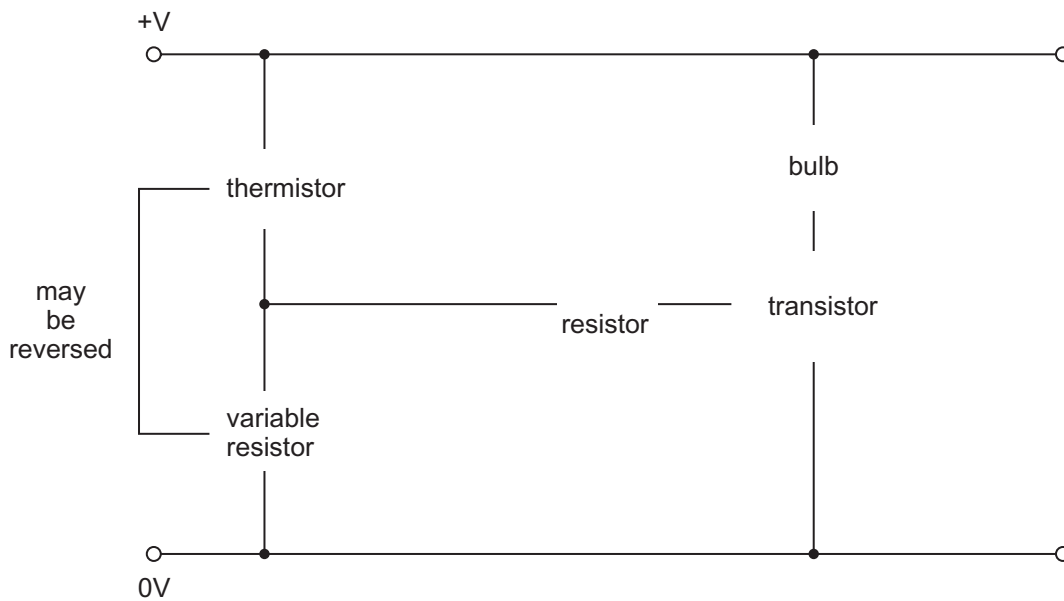
[4]

7

			AVAILABLE MARKS
3	(i) Reciprocating	[1]	5
	(ii) Follower	[1]	
	(iii) Pear shaped	[1]	
	(iv) $25 - 15 = 10\text{ mm}$	[1]	
	Downwards	[1]	
4	(i) Size of leaflets, Number to be held, etc any suitable answer	[1]	7
	(ii) Acrylic or other suitable plastic material	[1]	
	Easily formed etc	[1]	
	(iii) Suitable explanation with reference to: A line bender and	[1]	
	Former or Jig	[1]	
	(iv) To keep the holder in shape when screwing or To hold the leaflets in place	[2]	

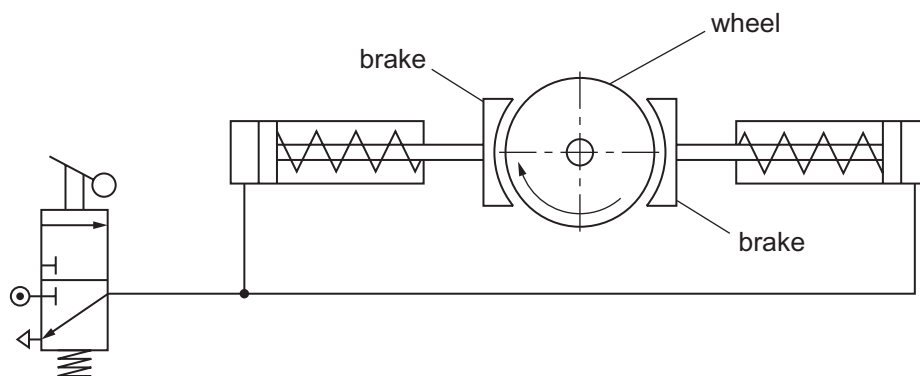
5 (a) Transistor, Variable resistor, Resistor, Thermistor 4×1 [4]

(b) 1 mark for each symbol correctly drawn and inserted in diagram [5]



9

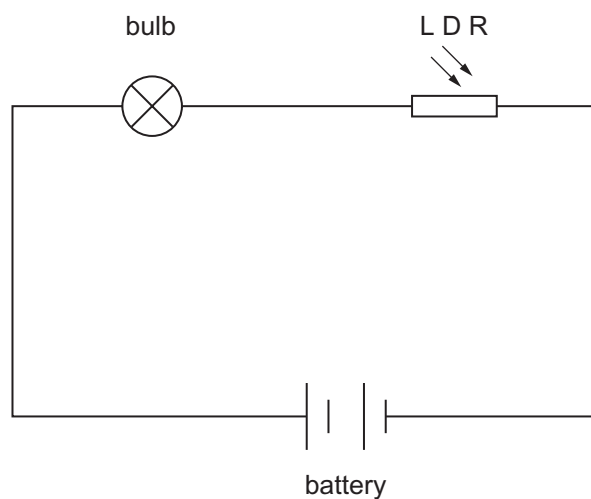
6 (a) Lever
Plunger
Push button
Roller trip [4]



(b) Connection to 3/2 valve
Connection to LH cylinder
Connection to RH cylinder [3]

7

- 7 (i) Non-ferrous [1]
 (ii) To change the properties of the material [2]
 (iii) Centre punch or dot punch [2]
 (iv) Polish or clear lacquer [1]
- 8 (a) (i) Fig. 8 [1]
 (ii) **Two** batteries connected in **series**/or reference to **increased voltage** [2]
 (b) (i) Light Dependent Resistor [1]
 (ii) In dark conditions LDR resistances increases therefore bulb will become dimmer and/or go out. [2]
 (iii) For use in a dark room. [1]
 (iv) 1 mark for each labelled symbol, 2 marks for connections



[5]

12

9 (a) See flow chart

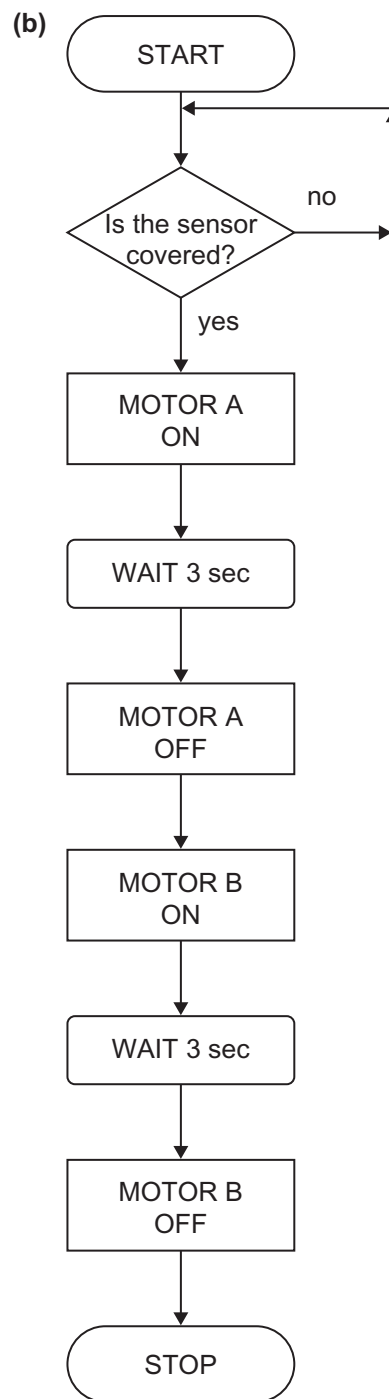
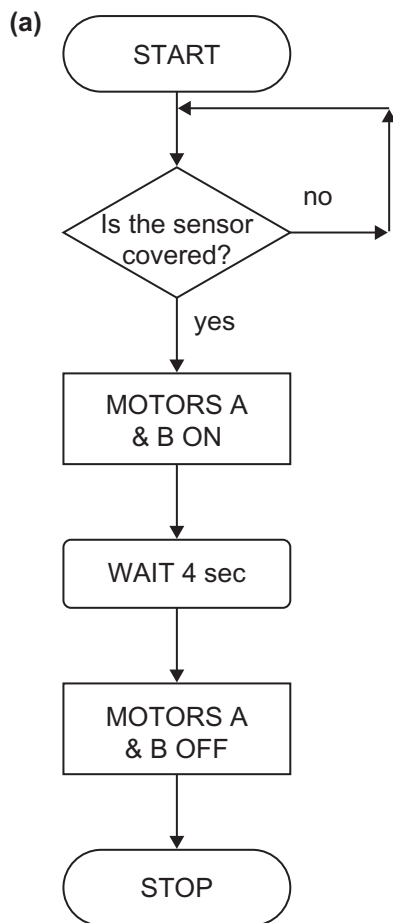
[4]

(b) See flow chart

[7]

AVAILABLE
MARKS

11



10 (a) (i) Steel	[1]	AVAILABLE MARKS
(ii) Paint, Galvanize	[1]	
(iii) Welding	[1]	
(iv) Access at A may be restricted	[2]	
(b) (i) Bolting/self-tapping screws	[1]	
(ii) Easy access for bolting etc	[1]	
		7

11 Indicative Content:

- Get all the necessary component parts.
- Attach each component to platform/board/base using screws or suitable catches to secure fixing.
- Connect piping.
- Turn on air supply.
- Set air supply pressure.
- Test/run circuit.
- Turn off air supply when finished
- Disconnect piping and components

Safety Precautions:

- Make sure air supply is off before starting circuit.
- Check settings on the air supply.
- Wear goggles.
- Check piping is secure.
- Check components are secure.
- Take care when using the airline.
- Turn off air supply while changing or checking components.
- Keep hands away from moving parts.

[10] 10

Response Type	Description	Mark Band
Limited	Students correctly identify very few steps in the pneumatic process and no safety precautions. The level of accuracy of spelling, punctuation and grammar is limited in most cases. Form and style is generally inappropriate as is the use of specialist terms.	[1]–[4]
Satisfactory	Students correctly identify some steps in the pneumatic process and some safety precautions. The level of accuracy of spelling, punctuation and grammar is satisfactory in most situations. The form and style is satisfactory in most cases and specialist terms are used appropriately in some cases.	[5]–[7]
Very good	Students correctly identify the majority of steps in the pneumatic process and the majority of safety precautions. The level of accuracy of spelling, punctuation and grammar is very good. The form and style is of a high standard and specialist terms are used appropriately at all times.	[8]–[10]

When a response is not worthy of credit then a **[0]** mark should be awarded.

Total

**AVAILABLE
MARKS**

90