NAME _____ CLASS _____

INPUT, PROCESS, OUTPUT

Every electronic system can be broken into three parts. An **input** senses something or is operated by the user. A **process** decides what to do. An **output** does the job.

Engineers draw this as a **system diagram**: three boxes joined by arrows. The torch you will make has a push switch input and LED outputs.

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1 Write the letter of the correct description under each component. 6 marks



PUSH SWITCH ☐



TOGGLE SWITCH ☐



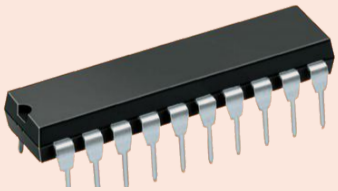
TILT SWITCH ☐



THERMISTOR ☐



LDR ☐



PROCESSOR ☐

A Senses temperature

B Turns on only while it is pressed

C Makes decisions using a program

D Stays on or off until it is flicked again

E Senses light level

F Turns on or off when it is tilted

2 Complete the system diagrams. 8 marks

	Input	→	Process	→	Output
Torch		→		→	
Automatic night light		→		→	
Fire alarm		→		→	
Electric fan		→		→	

3 **CHALLENGE** An LDR's resistance goes **down** as light gets brighter. A thermistor's resistance goes **down** as it gets hotter. Suggest a product that could use each one. 2 marks

BRITISH STANDARD SYMBOLS

Engineers draw **circuit diagrams** using symbols instead of pictures. The symbols follow a **British Standard**, so engineers anywhere can read them.

Symbols are quick to draw and leave no doubt about which component is meant. Circuits can then be built and tested in **simulation software** before any real parts are used.

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4 Draw the British Standard symbol for each component. 12 marks

CELL	BATTERY	LAMP	SWITCH

PUSH SWITCH	RESISTOR	LED	LDR

THERMISTOR	MOTOR	BUZZER	VOLTMETER

5 Give **two** reasons why engineers use symbols rather than pictures. 2 marks

6 Give **three** reasons why an engineer might simulate a circuit before building it. 3 marks