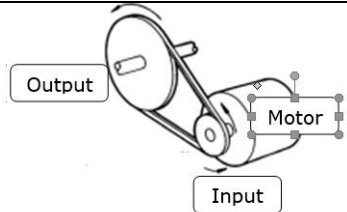


Annual Examinations for Secondary Schools 2022

YEAR 9	DESIGN & TECHNOLOGY	MARKING SCHEME
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SECTION A: CORE

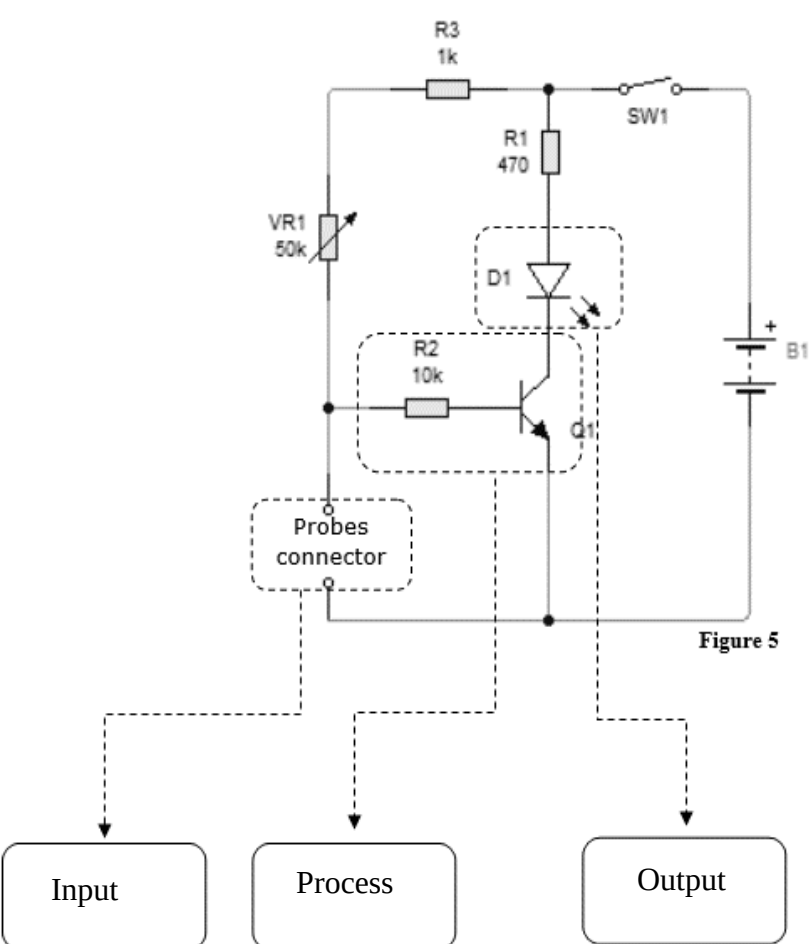
QUESTION NUMBER		ANSWER	MARKS ALLOTTED
1	a	Belt and pulleys	1 mark
	b		1 mark
	c	No, it is a reduction.	1 mark
2	a	No running in the lab.	1 mark
	b	Wear protective clothing. <i>Accept other answers that are relevant</i>	1 mark
3		Copper is a non-ferrous metal and its ore is mined as a pure mineral. The consumer electronics industry frequently uses copper because of its conductive properties .	1 mark each (total 3 marks)
4		<div>Cotton Flax (linen)</div> <div>Wool Silk</div>	1 mark each (total 4 marks)
5	Engineers' vice	To hold metals or other materials while cutting or bending.	½ mark x 12 Total 6 marks
	Adjustable bevel	To measure or mark different angles.	
	Vernier calliper	To measure accurately various things.	
	G-clamp	To hold tight two or more pieces together.	
	Belt/disk sanding machine	To finish or sand down materials such as plastics and woods.	
	Vacuum former	To form sheets of plastic into a desired shape according to a mould.	
6		Isometric projection Oblique projection	1 mark x 2 Total 2 marks

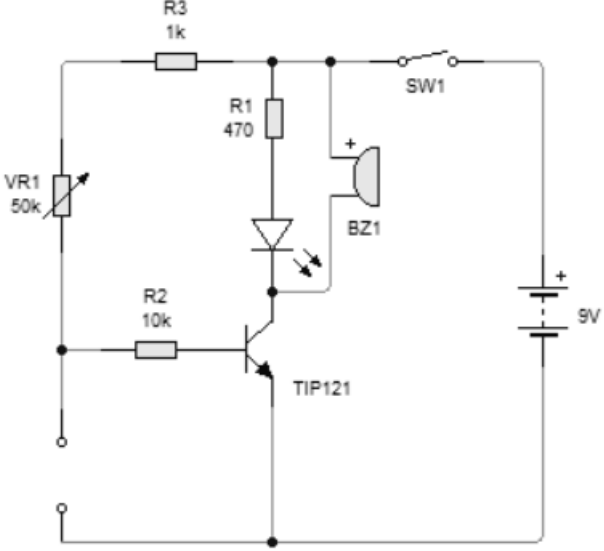
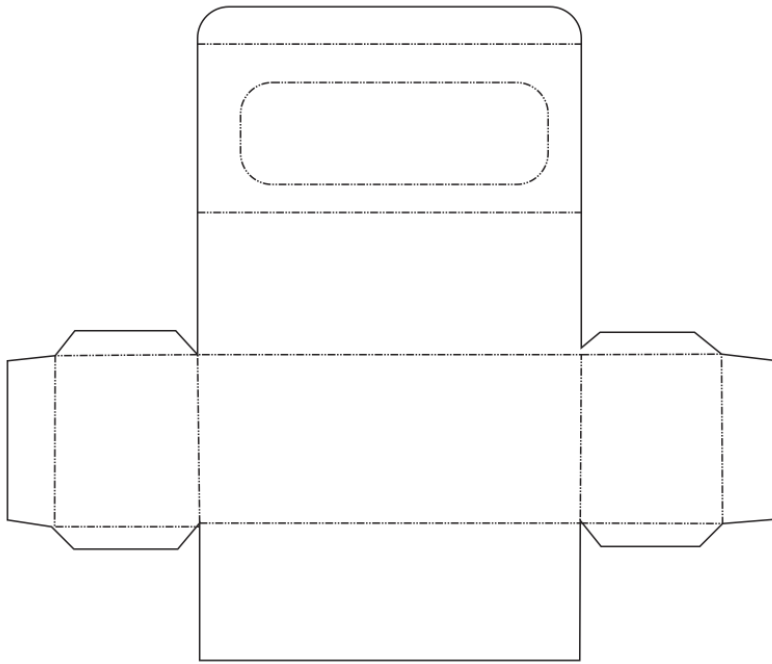
SECTION B: DESIGN ASPECT

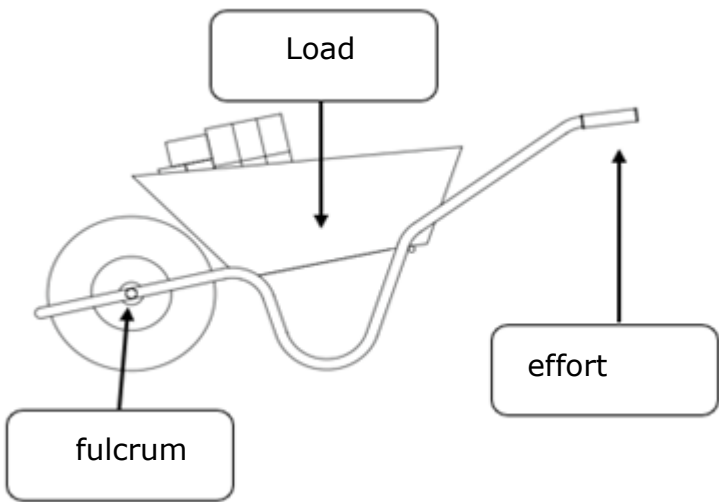
QUESTION NUMBER		ANSWER	MARKS ALLOTTED
7	a	Getting information of materials that can suit the project. <i>Why:</i> To use properly the materials according to their specifications.	1 mark x 4 Total 4 marks
	b	Conducting questionnaires and interviews. <i>Why:</i> Getting to know the context better. <i>Other suitable answers are to be considered as equally valid.</i>	
	c	The most important advantage of a prototype is that it simulates the real and future product. It can help attract customers to invest in the product before allocating any resources needed for implementation. One can test the design's correctness before it comes into production and discover any design errors. <i>Other suitable answers are to be considered as equally valid.</i>	2 marks
	d	Styrofoam, cardboard and cheap wood such as MDF or chipboard are valid materials for prototyping. <i>Other suitable answers are to be considered as equally valid.</i>	1 mark
8	a	The design must include one sustainable feature.	
	b	The design must have space inside to include a circuit.	1 mark
	c	The design must resist outdoor conditions.	1 mark
	d	The design must complement the surroundings.	1 mark
	e	The design must be portable and safe to use. <i>Other suitable answers are to be considered as equally valid.</i>	1 mark
9		Reward marks as follows for each idea: <ul style="list-style-type: none"> • 2 marks for good communication (sketching techniques, colour, clarity, good proportion) • 1 mark for mentioning any sustainable features or reused materials in the design. • 2 marks for improvements of design in relation to situation (measurements, good choice of materials, other features such as size and aesthetic features, etc.) 	5 marks x 2 Total 10 marks
10		Reused materials keep goods and materials out of the waste stream. Reuse reduces the strain on valuable resources, such as fuel, forests, and water supplies, and helps safeguard wildlife habitats. Reuse creates less air and water pollution than making a new item or recycling. Reuse results in less hazardous waste. <i>Other suitable answers are to be considered as equally valid.</i>	2 marks

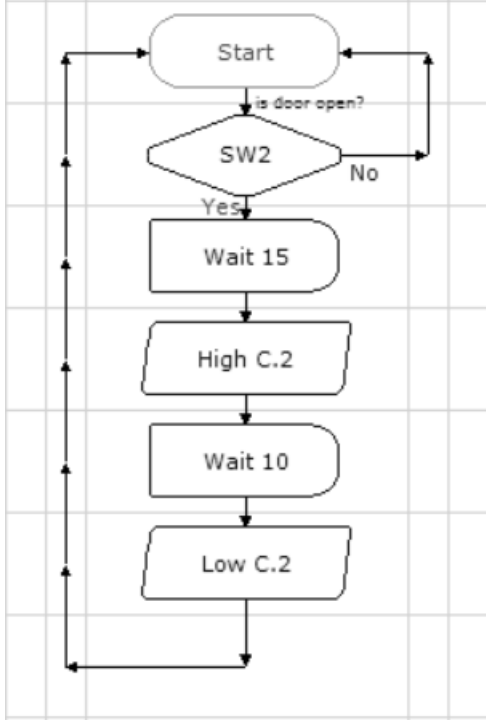
11	<i>Award 1 mark for explaining a proper method how to test suitably their idea. Award 1 mark for explaining a proper method how to evaluate suitably their idea.</i>	1 mark each Total 2 marks
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SECTION C: TECHNOLOGY ASPECT

QUESTION NUMBER	ANSWER		MARKS ALLOTTED
12	B1	Battery	1 mark x 6 6 marks
	SW1	Switch	
	R1	Resistor	
	D1	Light emitting diode	
	VR1	Variable resistor	
	Q1	NPN transistor	
13	 <p>Figure 5</p> <p>Input Process Output</p>		1 mark x 3 Total 3 marks

14	 <p>Award full marks for connecting the buzzer with positive lead connected to positive side of circuit or parallel to the LED.</p>	2 marks	
15	Darlington Pair	2 marks	
16	Accept any 2 components from the circuit that are connected in series.	2 marks	
17	a	 <p>Award 1 mark for using appropriate scale. Award 2 marks for correct net. Award 1 mark for flaps. Award 1 mark for inserting the hole in the correct part of the development.</p>	Total 5 marks

	b	Material: Cardboard.	1 mark
		<p>Why: It is highly flexible, it can hold a variety of products, lightweight, it is safe to use and it is not expensive.</p> <p><i>Other suitable answers are to be considered as equally valid.</i></p>	2 marks
18		<p>Reward marks as follows:</p> <p>2 marks for good communication (sketching techniques, colour, clarity, good proportion)</p> <p>1 mark for mentioning any recycled fabric.</p> <p>1 mark for annotations.</p> <p>2 marks for showing how fabrics are to be joined together.</p> <p>1 mark for using correct fasteners.</p>	Total 7 marks
19	a	Linkage. To transfer the rotary motion of the motor to an up and down motion to the rest of the mechanism. (<i>This may include either part B or the linkage rod</i>).	2 marks
	b	Lever (2 nd class lever) or linkage. To follow the path of linkage A and/or lift linkage rod.	2 marks
	c	Fixed pivot. To hold the linkage/lever connected to the fixed base.	2 marks
20	a	Oscillation	1 mark
	b	Rotary	1 mark
	c	Linear	1 mark
21		 <p>The diagram shows a wheelbarrow. A box labeled 'Load' is in the middle of the tray with a downward arrow. A box labeled 'fulcrum' points to the wheel with an upward arrow. A box labeled 'effort' points to the handles with an upward arrow.</p>	<p>1 mark each</p> <p>Total 3 marks</p>
22		2 nd class lever	2 marks

23	i)	Putting the load closer to the fulcrum.	1 mark x 2
	ii)	Longer distance from load to effort.	Total 2 marks
24		Award 2 marks for using 2 proper primary colours.	Total 2 marks
25	a	Programmable integrated circuit (PIC)/(08M2)	1 mark x 3
	b	4.5V	Total 3 marks
	c	Push to brake switch	
26		 <pre> graph TD Start([Start]) --> SW2{is door open?} SW2 -- No --> Start SW2 -- Yes --> Wait15([Wait 15]) Wait15 --> HighC2[/High C.2/] HighC2 --> Wait10([Wait 10]) Wait10 --> LowC2[/Low C.2/] LowC2 --> Start </pre> <p>Award 1 mark for inserting the 15 seconds WAIT command in its proper place.</p> <p>Award 1 mark for inserting the 10 seconds WAIT command in its proper place.</p> <p>Award 1 mark for inserting the arrows to start command after command LOW C.2.</p> <p>Award 1 mark for inserting the arrows to start command after NO of decision command.</p>	1 mark x 4 Total 4 marks