DIRECTORATE FOR QUALITY AND STANDARDS IN EDUCATION
Department of Curriculum Management
Educational Assessment Unit

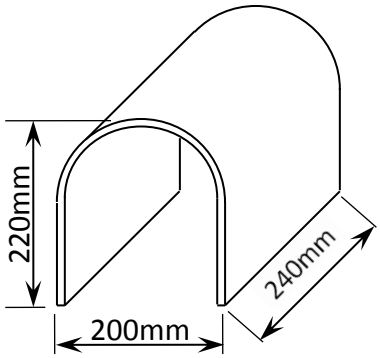
LEVELS

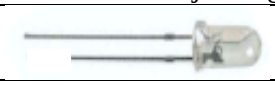
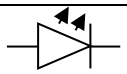
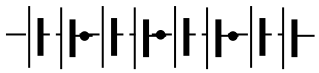
5 – 6 – 7 – 8

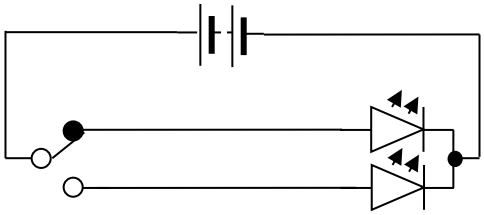
Annual Examinations for Secondary Schools 2014

FORM 1 DESIGN AND TECHNOLOGY MARKING SCHEME

QUESTION NUMBER			ANSWERS	MARKS	LEVEL
1			Situation, Design Brief, Research, Specifications, Initial Ideas, Chosen Idea, Development, Planning, Making, Testing, Evaluation.	**½ x 10 = 5**	**7**
2			Situation	**1**	**5**
3			*Any THREE from the following:* robot, head mask, actor, film, internal lighting/sound.	**1 x 3 = 3**	**6**
4			*Any THREE from the following or other relevant answers:* Library, Internet, Asking the film director.	**1 x 3 = 3**	**6**
5	**a**		Award: • 2 marks for notes/materials • 1 mark for dimensions • 1 mark for colouring	**4**	**6**
	b		Award 1 mark for each of the following: • Showing block diagrams • Suggesting Inputs • Suggesting Processes • Suggesting Outputs	**1 x 4 = 4**	**6**
6	**a**		Ferrous means that the metal contains iron.	**1**	**7**
	b		Ferrous metals are generally attracted by a magnet.	**1**	**7**
	c		Circle around: engineers' vice and ball-peen hammer	**½ x 2 = 1**	**6**
	d		engineers' vice: holding the wire ball-peen hammer: tapping the wire into shape/making sharp bends Award 1 mark for naming each tool; 1½ marks for naming each use.	**5**	**6/7**
7	**a**		All these metals are non-ferrous.	**1**	**7**
	b	**i**	copper	½	**7**
		ii	gold	½	**7**
		iii	aluminium	½	**7**
		iv	copper	½	**7**
		v	lead	½	**7**
		vi	aluminium	½	**7**

	c		bluish white--lead silvery white--aluminium reddish brown--copper bright yellow--gold	**1 x 4 = 4**	**7**
	d	**i**	✓ they are lighter in weight.	**1**	**7**
		ii	✓ it is very expensive.	**1**	**7**
		ii	✓ it is toxic.	**1**	**7**
8	**a**		Polystyrene is a thermoplastic, and therefore it can be reheated and reshaped.	**1**	**7**
	b	**i**	 *Other variation in dimensioning styles are acceptable, as long as student indicates the correct side.* Award 1 mark for each side.	**1 x 3 = 3**	**7**
		ii	First you have to find the length of arc and then add it to the lengths of the straight edges which are 120mm each.	**2**	**7**
	c		*Students should shade the central part of the sheet.*	**1**	**7**
	d		Name of tool: hot-air blower Safety precautions: *Any TWO from the following or other relevant answers:* – Use the tool with dry hands. – Make sure its connecting cable is out of the working area or gang way. – Avoid overheating the plastic. – Heat the plastic in a well-ventilated area. – Keep away from heating element/parts that become heated. – Let the tool cool down before storing it. Award 1 mark for the name of tool, 1 mark for each safety precaution.	**3**	**5/6**
	e		 Award only 1 mark if student draws in 2D.	**2**	**7**
9	**a**		NATURAL WOOD: red deal, parana pine, beech MANUFACTURED BOARDS: chipboard, MDF, plywood	**½ x 6 = 3**	**7**
	b		Award: • 1 mark for drawing the grain • 1 mark for drawing the end of grain on the correct face • 1 mark for labelling	**1 x 3 = 3**	**7**

	c	*Students should draw any ONE of the following:* – The planks being joined together by PVA glue which is then left to dry in a clamped position. – The planks being joined together by hammering nails on the same side of the plank. – The planks being joined together by driving screws through pilot holes made on the same side of the plank. Award: • 1 mark for showing PVA glue/nails/screws. • 1 mark for showing the clamping/hammering/pilot holes. • 1 mark for the name of the joining method.	**3**	**7**
10	**a**	Circle round 	**1**	**5**
	b	Anode  Cathode	**½ x 2 = 1**	**6**
	c	 *Any standard variations of LED symbols are accepted.*	**2**	**6**
11	**a**	Circle round 	**1**	**5**
	b	Secondary type batteries can be used more than once. *Accept also rechargeable.*	**2**	**7**
	c		**2**	**7**
	d	$V_t = V_1 + V_2 + V_3 + V_4$ $V_t = 1.5V + 1.5V + 1.5V + 1.5V$ $V_t = 6V$ Award 2 ½ marks for calculations, ½ mark for correct answer.	**3**	**7**
12	**a**	Push to make switch.	**1**	**5**
	b	A non-latched switch keeps its non original state until it is pressed. Once released it turns into its original state.	**2**	**6**
	c	Voltage across resistor = 9V – 6V = 3V R = V / I = 3V / 0.022 A ≈ 163Ω Award 3 ½ marks for calculations and ½ mark for correct answer.	**4**	**7/8**
	d	Award 2 marks for correct placement of resistor, 2 marks for correct placement of buzzer.	**4**	**7**
	e	*Any ONE from the following or other relevant answers:* never inhale fumes; never touch the soldering iron bit.	**1**	**5**
	f	Labelling should be in this order ONLY – soldering iron, solder, side cutter, wire stripper.	**½ x 4 = 2**	**5**

13	**a**		To model or test electronic circuits.	**2**	**5**
	b	**i**	Input component/s - Battery Process components/s - SPDT Switch Output components/s - Green Flashing LED and Yellow Flashing LED. Award ½ mark for each output component.	**3**	**7**
		ii	SPDT – Single pole double throw.	**1**	**6**
		iii	Since flashing LEDs have an internal resistor.	**2**	**7**
		iv	 Award 2 marks for correct use of SPST switch symbol, 4 marks for correct design of electronic circuit.	**6**	**7/8**

Breakdown of marks:

LEVEL	MARKS
8	9
7	56
6	25
5	10
TOTAL	100