

Design and Technology (Food Technology)

General Certificate of Secondary Education

Unit **A524**: Technical Aspects of Designing and Making

Mark Scheme for January 2013

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All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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Question			Answer	Marks	Guidance
1	(a)	(i)	<p>One x 1 mark for each correct answer. 2 x 1 mark Two required Changes TO REDUCE THE COST</p> <ul style="list-style-type: none"> • Shallot to onion/reduce amount/remove • Butter to margarine/ reduce amount/remove/vegetable oils (not olive) • Basmati rice to any other rice eg patna/long grain/risotto • Peeled Prawns to tuna/white fish/ham/frozen prawns/peas/pulses/reduce amount/remove • Stock to vegetable cooking water/water • Parmesan cheese to any named cheaper cheese/reduce amount/remove • Buying own brand products/value products • Buying in bulk. • Smaller portion sizes • Don't buy ready prepared ingredients 	2	<p>Any two ways of reducing the cost of the risotto. Do not accept: 'Halving the recipe' 'Less ingredients' (unless named) 'Cheaper cheese' (unless named)</p> <p>Accept reduce or remove only once Reducing the rice would make the risotto more expensive per portion</p>
		(ii)	<p>One x 1 mark for each correct answer. 2 x 1 mark Two required Change: CHD</p> <ul style="list-style-type: none"> • Butter to margarine/oil/any suitable named lower fat product/lite/reduced fat/unsalted butter/reduced quantity of butter • Prawns to any named fish/crab sticks/vegetable/chicken/ lower fat meat • Parmesan to lower in fat/lite named cheese eg edam/mozzarella. Change to herbs/vegetables (named) /reduce the quantity of parmesan cheese • Stock to water/low salt stock • Rice changed to wholemeal rice/brown rice • Add named vegetables to increase fibre 	2	<p>Any two ways of reducing the fat Lowering salt Increasing the fibre:</p> <p>Do not accept the removal of ingredients without a replacement.</p> <p>Accept 'low fat' as a descriptor on this question only</p>

Question	Answer	Marks	Guidance
(b) (i)	<p>One x 1 mark for each correct staple food. 2 x 1 mark Two required Any two named cereals or staple product: Wheat/Maize/Oats/Barley/Rye/Couscous/Tubers/Pulses/ noodles/grains/potatoes/yams/cassava/breadfruit/plantains/bread/pasta.</p>	2	Do not accept 'cereal'
	<p>(ii) One x 1 mark for each correct point.</p> <ul style="list-style-type: none"> • Cheaply produced cereal/Inexpensive source of calories • Crop grown in a country • The main source of carbohydrate/starch/calories/energy in a diet • Regularly eaten/ Eaten everyday/widely available • Readily available carbohydrate • Other products can be made from it. • Bulks up meals/goes with a variety of other foods 	2	<p>Allow 2 x 1 mark for two separate points. Allow 2 marks for one full description</p>
(c)	<p>Four x 1 mark.</p> <ul style="list-style-type: none"> • Improve the sensory qualities – new exciting flavour/improve from sensory testing/make it appeal • Meet nutritional guidelines – lower in fat/salt/sugar product/higher in fibre • Meet needs of target group – to increase market potential/appeal to wider range • To keep competitive – make new /unique product/to keep up to date with their competitors/ to increase market potential/people buy more • Create a new range eg/budget/luxury/value/healthy eating – to meet needs of user • Make it easier to cook/reheat for consumer • Use foods in season/local foods – to make the product meet sustainable needs/lower carbon footprint • Alter the amount of additives in a recipe – using seasonings/flavour • To make it suitable or cheaper for large scale production – using vegetable oil instead of solid fat in biscuits • To make the product suitable for people with special dietary requirements- any named • To abreast of new technologies/ingredients • To meet the design specification 	4	<p>Allow 2 x 2 marks for two detailed explanations. Allow 4 x 1 mark for four separate points.</p>

Question	Answer	Marks	Guidance										
2 (a) (i)	<p>One x 1 mark for one correct method of cooking the joint of beef.</p> <ul style="list-style-type: none"> • Roasting/Pot roasting/Braising/Pressure Cooking/Slow Cooking/Microwaving/Boiling <p>(ii)</p> <p>One x 1 mark for one correct reason for the method of cooking beef.</p> <ul style="list-style-type: none"> • Roasting – suitable for dry heat/develops the flavour/moisture/crisp outside and tender meat/beef needs long slow cooking/can cook other foods at same time • Pot roasting/braising – low temperature method/develops the flavour/makes it more tender/moist method • Pressure cooking – cooks quickly/tenderises/moist method/lower fat method • Slow cooking – low energy/low cost/tenderises/cooks vegetables as well/moist method • Microwaving– lower cost/may have limited equipment. 	2	<p>Do not accept: Baking Oven Grilling Frying</p> <p>If the method of cooking given is incorrect, a mark can be awarded for stating a correct reason for choosing a method of cooking Eg steaming retains vitamins</p> <p>Do not accept Quicker Soft</p>										
(b)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2"> <p>One x 1 mark for each correct answer. 4 x 1 mark Four marks required</p> </td> </tr> <tr> <td>Protein</td> <td>Growth of cells/repair of cells/builds muscles/hormones/enzymes/transportation in the blood supply/energy</td> </tr> <tr> <td>Iron</td> <td>Formation of red blood cells/transportation of oxygen/formation of haemoglobin/prevents anaemia</td> </tr> <tr> <td>Fat</td> <td>Energy/insulation/body warmth/protection of organs/essential fatty acids/fat soluble vitamins</td> </tr> <tr> <td>Vitamin B Group</td> <td>Metabolic processes/nerves/healthy nervous system/energy release from carbohydrate, fat and protein/mucous membranes/blood formation/prevents spina bifida/cell division/transport of nutrients</td> </tr> </table>	<p>One x 1 mark for each correct answer. 4 x 1 mark Four marks required</p>		Protein	Growth of cells/repair of cells/builds muscles/hormones/enzymes/transportation in the blood supply/energy	Iron	Formation of red blood cells/transportation of oxygen/formation of haemoglobin/prevents anaemia	Fat	Energy/insulation/body warmth/protection of organs/essential fatty acids/fat soluble vitamins	Vitamin B Group	Metabolic processes/nerves/healthy nervous system/energy release from carbohydrate, fat and protein/mucous membranes/blood formation/prevents spina bifida/cell division/transport of nutrients	4	<p>The function of the nutrient must relate to the nutrient. Accept any named specific B group vitamin.</p>
<p>One x 1 mark for each correct answer. 4 x 1 mark Four marks required</p>													
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Question			Answer		Marks	Guidance
			Selenium	Anti-oxidant properties needed for cellular function and a component of anti-oxidant enzymes		
			Zinc	Needed for cellular metabolism, immune function, protein synthesis and wound healing.		

Question		Answer	Marks	Guidance	
				Content	Levels of response
2	(c)	<p>Explanation could include any of the following points:</p> <ul style="list-style-type: none"> • Cross contamination/transfer from raw meat to cooked meat products by: foods touching/blood and juices dripping/transferring by hands, work surfaces/knives or equipment • Good personal hygiene of workers – hand washing/clean protective overalls • Good hygiene during the cooking and serving – cover and cool all cooked meat as rapidly as possible / Preparing too far in advance/exposing to flies etc • Use of red chopping boards • Incorrect storage ie room temperature instead of below 8°C/not covering/bottom of refrigerator to avoid drip contamination • Storage – stock rotation/use by date • Not thawing meat thoroughly before cooking • Undercooking meat – bacteria not killed in centre/use of temperature probe • Chilling Not allowing meat to cool before putting into chill cabinets or freezer. 90 mins to chill below 8°C Use of blast chiller to cool quickly 	6	<ul style="list-style-type: none"> • Raw meat is a high risk food – high in protein and moisture • Raw meat contains harmful bacteria. Other micro organisms/may contain salmonella • Bacteria quickly reproduce in meat/37°-63°C/danger zone. • Temperatures above 72 °C destroys most bacteria. 	<p>Level 3 (5–6 marks) Thorough explanation, showing detailed understanding of the food hygiene rules that must be followed when preparing and cooking meat and meat products. Specialist terms will be used appropriately and correctly. The information will be presented in a structured format. The candidate can demonstrate the accurate use of spelling, punctuation and grammar. May address two points in depth or a range of points. Technical terms to look for: Cross contamination/micro organisms/bacterial contamination/salmonella/correctly stated temperatures.</p> <p>Level 2 (3–4 marks) Adequate explanation, addressing one or two issues, showing some understanding of the food hygiene rules that must be followed when preparing and cooking meat and meat products. There will be some use of specialist terms, although these may not always be used appropriately. The information will be presented for the most part in a structured format. There may be occasional errors in spelling, grammar and punctuation.</p>

Question		Answer	Marks	Guidance	
				Content	Levels of response
		<ul style="list-style-type: none"> • Reheating to the correct temperature for long enough (over 72°C) • Hot Holding Making sure hot meat products are kept at hot holding temp (63°C). • Freezing. Do not refreeze meat 			<p>Level 1 (0–2 marks) Basic points, showing limited understanding of the food hygiene rules that must be followed when preparing and cooking meat and meat products. There will be little or no use of specialist terms. Answers may be ambiguous or disorganised. Errors of grammar, punctuation and spelling may be intrusive. There may only be one or two word answers.</p>

Question		Answer	Marks	Guidance
3	(a)	<p>One x 1 mark for each correct function. 2 x 1 mark Two marks required</p> <ul style="list-style-type: none"> • Blood clotting • Heart regulation • Strong bones/bone growth/bone repair • Strong teeth/tooth growth • Nerves • Muscle function • Works with phosphorus/Vit D in the calcifying process • Prevention of bone disease/rickets/osteoporosis • Prevent brittle bones. 	2	Accept strong bones and teeth on one line

Question		Answer	Marks	Guidance
(b)	(i)	<p>One x 1 mark for each correct answer. 1 x 1 mark One mark required</p> <ul style="list-style-type: none"> • Whole milk/full fat milk. 	1	
	(ii)	<p>One x 1 mark for each correct answer. 2 x 1 mark Two marks required</p> <ul style="list-style-type: none"> • May be a lower in fat product • Individual portion size • Easy for a child to open/hold • Nutrition- Contains Vit A and D/ protein/Source of energy • Easy to eat/eat on the go • Smooth not lumps in it/no chewing needed/easy to digest • No preparation needed • Long storage life • May contain fruit • Variety of flavours available • Ideal for snacks/lunchboxes/puddings • Cartoon characters/tv advertising/attractive packaging • Parents think it is 'healthy' • Appeals to children as sweet 	2	<p>Do not accept: Answers linked to calcium Aids digestion Easy Healthier Healthier than sweets</p>
(c)	(i)	<p>One x 1 mark for correct answer. 1 x 1 mark One mark required</p> <ul style="list-style-type: none"> • Destroys harmful bacteria/pathogens/kills bacteria • Improves the keeping quality/extends shelf life • Makes it safe for human consumption • Prevents the growth of bacteria. 	1	
	(ii)	<p>One x 1 mark for correct answer. 2 x 1 mark Two mark required</p> <ul style="list-style-type: none"> • Milk is heated to 72°C • Held at 72° for 15-25 seconds • Rapidly cooled/chilled to below 10 °C. 	2	<p>1 mark for a simple statement. 2 marks for correctly stating the temperature or time Do not accept 'milk is pasteurised by heat treating ' this is a repeat of ci. Allow 1 mark for 'heated to high temp and cooled'</p>

Question	Answer	Marks	Guidance
(iii)	<p>One x 1 mark for correct answer. 2 x 1 mark</p> <ul style="list-style-type: none"> • UHT • Sterilised • AFD/Freeze dried/Dried • Evaporated • Condensed • Canned. 	2	Do not accept long life Boiling microwaving
(d)	<p>One x 1 mark for correct answer. 2 x 1 mark Two marks required</p> <ul style="list-style-type: none"> • Identify a target group • Identify a need/what people want • Consideration of food trends • Dietary needs of groups of people • Current dietary trends. Low fat/sugar salt. High fibre • Sustainability/environmental issues • Cultural issues/religious beliefs • Ethical issues/organic or not • Social issues/low income. • Storage conditions • Shelf Life • Original different product 	2	Question is asking to develop a design brief not a specification

Question			Answer	Marks	Guidance
4	(a)	(i)	<p>One x 1 mark for correct answer. 1 x 1 mark</p> <p>Target Groups:</p> <ul style="list-style-type: none"> Elderly /Students/Single people/Families/Adults/Workers/Vegetarians/Children/ Teenagers 	1	One mark for correctly stating a target group. Do not accept on 'a diet/slimming diet/lactose intolerant/vegan'
		(ii)	<p>Reasons: 2 x 1 mark</p> <ul style="list-style-type: none"> Ready prepared No wastage Quick to cook/Can be reheated in a microwave No special equipment/utensil needed May be cheaper than buying all the separate ingredients No skills needed. It can be frozen /used later Correct portion size/meal for—one/ two/four Nutritional reason- good source of protein/fibre/calcium/energy/5 A Day Meat free Soft texture Luxury food Supporting UK economy 	2	2 x 1 mark for correct reasons linked to the target group Do not accept negatives responses: Teenagers would not like it Do not allow: Lazy Healthy Quick . Can accept Quick to cook/prepare/eat
		(iii)	<p>One x 1 mark for correct answer. 1 x 1 mark</p> <p>One mark required</p> <ul style="list-style-type: none"> Spring/Summer/Autumn/Winter 	1	Not a named month
		(iv)	<p>One x 1 mark for correct answer. 2 x 1 mark</p> <p>Two marks required</p> <p>Any correctly named British cheese</p> <ul style="list-style-type: none"> Cheddar/Cheshire/Stilton/Lancashire/Wensleydale/Double Gloucester/Derby/Caerphilly/Lymeswold/Red Leicester/Stinking Bishop 	2	

Question	Answer	Marks	Guidance
(b)	<p>One x 1 mark for correct answer. 4 x 1 mark Four marks required</p> <ul style="list-style-type: none"> • Fat is melted • Flour/corn flour is stirred into the fat on a medium heat • Liquid/milk is added gradually/Continuous stirring/brought to the boil to correct consistency • Add cheese/seasoning after the sauce has thickened 	4	<p>Allow up to four marks for four simple stages.</p> <p>Credit an understanding of the process. ie 'starch molecules absorb liquid and thicken it/gelatinisation' (maximum 2 marks)</p>
(c)	<p>One x 1 mark for correct answer. 2 x 1 mark Two marks required</p> <ul style="list-style-type: none"> • Meet healthy eating guidelines/encourage healthy lifestyle • 5 a day campaign/Change for life • Increase fibre intake/lowers cholesterol • Increase vitamin C/Vitamins/Minerals/ Micronutrients • Reduce intake of fatty, sugary foods/ lower the fat in our diet • Part of a balanced diet/Eat Well Plate • Add colour/variety/texture/flavour to diet • Lower in calories/reduces obesity • Antioxidants – protect against cancers/coronary heart disease/disease. • Reduces risk of bowel cancer and constipation 	2	<p>Do not accept 'healthy' Staple food'</p>

Question	Answer	Marks	Guidance
5 (a)	<p>One x 1 mark for correct answer. 6 x 1 mark Six marks required</p> <p>Savoury</p> <ul style="list-style-type: none"> • Predominately savoury ingredients • Could include cheese/eggs/named vegetables/herbs/seasonings/tofu/Quorn <p>Be hand held</p> <ul style="list-style-type: none"> • Includes a casing/container • Dimensions given • Shape – easy to hold. • Clearly shown how it is hand held in the drawing or by the name <p>High in energy</p> <ul style="list-style-type: none"> • Named suitable carbohydrate/fat included • Nuts/seeds/dried fruit/proteins/pulses <p>Vegetarian</p> <ul style="list-style-type: none"> • Ingredient (named) specific to vegetarian • Clearly shows an understanding of vegetarianism 	6	<p>Allow up to 4 marks for the design and 2 marks for the annotation Allow up to 4 marks for the design. Candidates must clearly show how the specification has been met to award the annotation marks.</p> <p>Savoury They cannot simply write savoury without naming a specific ingredient. If the product is not savoury they cannot be awarded the 'savoury mark'.</p> <p>Hand Held The combination must create a realistic snack product</p> <p>High in Energy Do not accept sugar</p> <p>Vegetarian Do not accept 'no meat' Do not accept 'vegetables' unless named</p>

Question	Answer	Marks	Content	Guidance
				Levels of response
(b)	<p>Description may include:</p> <p>CAD:</p> <ul style="list-style-type: none"> • Food photography -Digital cameras • Packaging design-Clip art/Scanned images/mood boards/Paint draw programs for art work/designing layout/designing nets • Research-Excel/databases for questionnaires/star profiles/costing spreadsheets/Word processing for questionnaires/ Desk top publishing • Internet to carry out research eg on special diets • Sensory testing: /tables/star profiles/analysis charts • Email to send reports/photographs quickly • Nutritional programs to carry out nutritional analysis • Developing new products/Modelling/Costing/Scaling Up/ Checking design matches the specification • Storing information <p>CAM</p> <ul style="list-style-type: none"> • Making the Product speed ingredients are added/controlling number of products made • Repetitive tasks carried out quickly – time saved eg cutting out pastry • Accurate consistent finish /quantities • Speed of production - lowers costs • Control of machinery 	6	How it is used - Not Advantages and Disadvantages of CAD/CAM	<p>Level 3 (5–6 marks) Thorough description, showing detailed understanding of how CAD/CAM could be used in the design and manufacture of a large quantity of snack products Specialist terms will be used appropriately and correctly. The information will be presented in a structured format. The candidate can demonstrate the accurate use of spelling, punctuation and grammar. Technical terms to look for: HACCP/sensors/production rate/metal detection/flow rates/stock control.</p> <p>Level 2 (3–4 marks) Adequate discussion, showing some understanding of how CAD/CAM could be used in the design and manufacture of a large quantity of snack products. There will be some use of specialist terms, although these may not always be used appropriately. The information will be presented for the most part in a structured format. There may be occasional errors in spelling, grammar and punctuation.</p> <p>Level 1 (0–2 marks) Basic discussion, showing limited understanding of how CAD/CAM could be used in the design and manufacture of a large quantity of snack products. There will be little or no use of specialist terms. May only consider CAD or CAM. Answers may be ambiguous or disorganised. Errors of grammar, punctuation and spelling may be intrusive. There may be only one or two words.</p>

Question			Answer	Marks	Guidance	
					Content	Levels of response
			<ul style="list-style-type: none"> • Sensors monitor critical control points(weight/temperature/ph/colour/thickness/moisture levels/tolerances) • Lowered costs as products are made at speed • Just in time system could be used to avoid wastage. • Quality Control rejecting products that are faulty • Increases Safety of workers • Making Packaging – cutting nets and printing information 			

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