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Mark Scheme (Results)

Summer 2016

Pearson Edexcel GCSE
In Design and Technology (5FT02/01)

Food Technology

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question Number	Answer	Mark
1.	D	**(1)**

Question Number	Answer	Mark
2.	C	**(1)**

Question Number	Answer	Mark
3.	A	**(1)**

Question Number	Answer	Mark
4.	B	**(1)**

Question Number	Answer	Mark
5.	B	**(1)**

Question Number	Answer	Mark
6.	C	**(1)**

Question Number	Answer	Mark
7.	B	**(1)**

Question Number	Answer	Mark
8.	A	**(1)**

Question Number	Answer	Mark
9.	C	**(1)**

Question Number	Answer	Mark
10.	C	**(1)**

Question Number	Answer		Mark
11(a)	**Knife block/knife holder / knife box/rack (1)**	To store/rack/hold sharp tools and equipment.	**(4)**
	Industrial /domestic Food mixer/processor (1)	Combine ingredients	
	Ladle	**Lift, spoon, portion, pour, stir, serve, measure, mix, move, transport, pickup, liquids (1)**	
	First aid kit	**To store/contain/hold/look after materials & tools used in the treatment of injury and accidents. (1)**	
		4 x 1	

Question Number	Answer	Mark
11(b)	• LBV Protein/ Protein • Vitamin B Thiamine • Vitamin B Niacine • Vitamin B Riboflavin • Vitamin E • Vitamin B • Folate • Iron • Fat • Fibre/ NSP • Starch	**(2)**

Question Number	Answer		Mark
11(c)	Oats	Muesli, biscuits, flapjacks, porridge, granola, coating for fish, adding to meatballs as a bulking agent	**(2)**
	Corn	Breakfast cereals, biscuits, bread, flour, foo foo,	

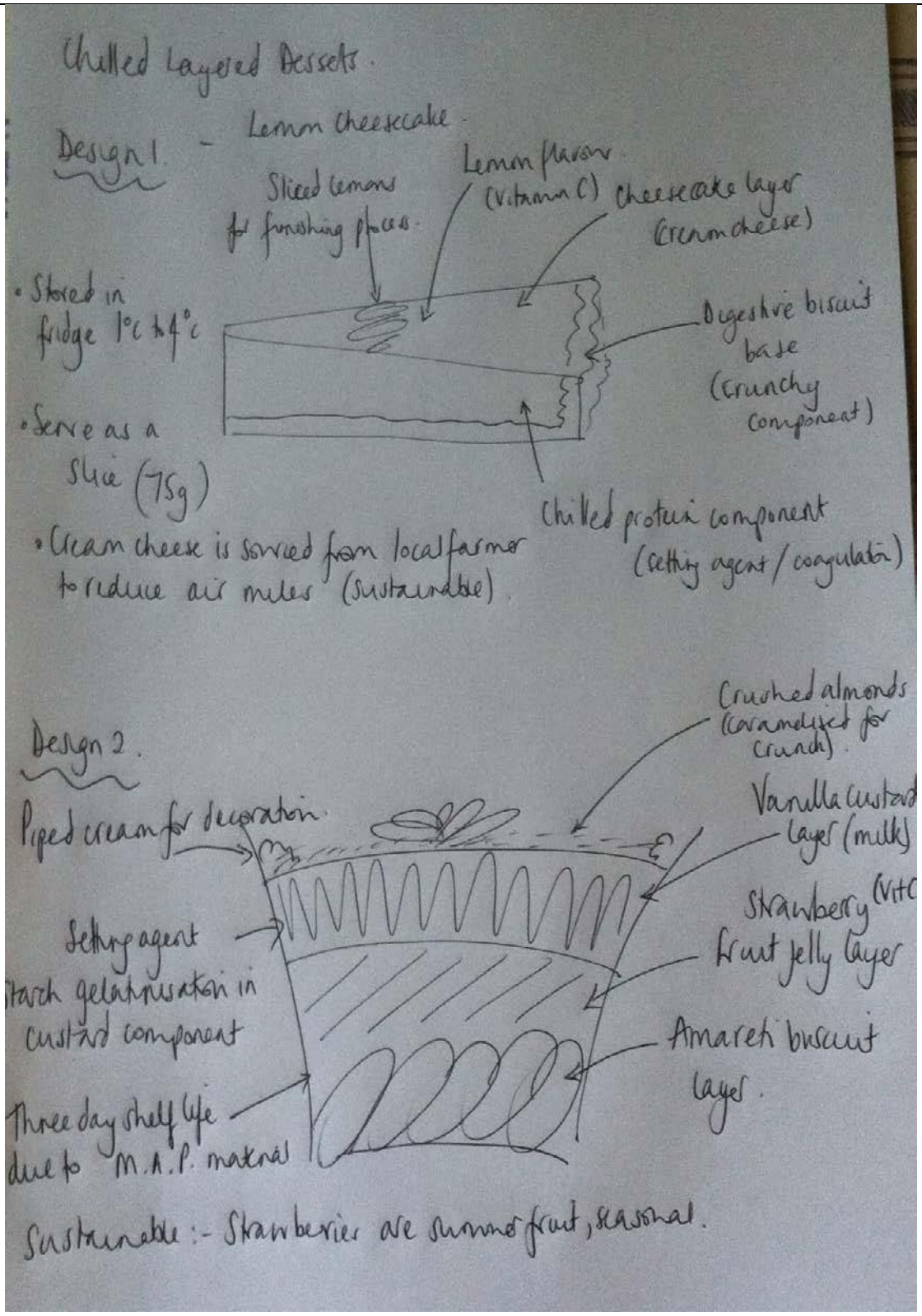
Question Number	Answer	Mark
11(d)	One description from: • The **extraction rate (%)** is the amount of the whole grain that is used (1) and this determines the **type and consistency of the flour**(1) • **Wholemeal flour** (100%): Contains 100% of the germ, bran and endosperm. (1) This flour has a brown colour and coarse, grainy texture. Fibre (1) • **Brown flour** (85-90%): Contains 85% of the germ, bran and endosperm (1). This flour has a light brown colour and grainy texture (1). • **White flour** (70%): Contains endosperm. Bran and germ have been removed during milling (1). In the UK white flour is fortified by law with iron, calcium, thiamine and niacin, to replace the nutrients lost during processing. This flour is a white colour with a smooth / powder like texture (1). White flour might be bleached (1) to retain its colour(1)	**(2)**

Question Number	Answer
11(e)	One description from the following: • Corn flour is made from ground maize and contains no gluten (1). It is therefore a useful ingredient for coeliac/gluten intolerant diets and allows the manufacturer to market gluten-free foods (1). • It is a useful thickening agent for liquids and sauces (1) because it is flavourless, odourless due to the 100% starch content and can be used to absorb other flavours during cooking (1). • Corn flour thickens (1) a sauce when it comes into contact with warm liquid/ heat and liquid.(1) • Corn flour is a modified maize product containing 100% starch (1) therefore it does not collapse on cooling/ freezing/ thawing and can be used during the cook chill process for ready meals (1)

Question Number	Answer	Mark
11(f)	One explanation from: • Rice is a highly nutritious food product, rich in fibre, starchy carbohydrate, Vitamin B complex and LBV protein (1), therefore it can support the growth of bacteria at temperatures between 5'C-63'C (1) • Cooked rice is high in moisture (1) and supports the growth of bacteria (bacillus cereus) with optimum conditions for microorganism growth: food and moisture. (1) • High risk foods are high in moisture and protein (1) therefore supporting the continued growth of micro-organisms to unsafe levels (1)	**(2)**

11(g)	Two modifications described • **Remove/replace the cheese(1)** and replace **with low fat cheese as it contains less saturated fat than normal cheese (1)** • **Remove/replace butter (1) and replace with oil/ low fat vegetable based margarine because it contains less saturated fat (1) DO NOT ACCEPT LOW FAT BUTTER** • **Remove/replace cooked bacon (1) and replace with a different named vegetable/fruit because it is lower in fat/ higher in fibre (1)** • **Remove/replace cooked bacon (1) and replace with tuna fish because it is lower in fat and higher in omega fats. (1) • Grill bacon (1) to reduce total fat content (1)** • **Swap pesto (1) for tomato puree as it is lower in fat (1)** • **Replace white flour with wholemeal flour (1)** because it is higher in fibre which absorbs fats during digestion(1) Only accept duplicate ingredients if descriptions/uses are sufficiently different.	**(4)**

Question Number	Answer	Mark
12	**Design idea 1** • **use a dairy food in one named component** milk/ cream/ yogurt/ crème fraiche/ sour cream/ ice cream / cheese / cream cheese(1) • **contain one named crunchy textured component** biscuit/ pastry/ gratin/ caramelised layer/ nuts/ crumble/ meringue/praline (1) • **use a named setting process in one component** Coagulation / gelatinisation/ jelly making / jamming / coulis / gelatine / whisked protein component/ heated protein component/ acid combined with protein component (1) • **be high in vitamin C** any named fruit (or vegetable ingredient - suitable for dessert carrots/ beetroot) high in vitamin C: berries/ fresh currants/ citrus fruit/ seasonal fruit (1) • **include a finishing technique** Grate chocolate / sprinkle or dust icing sugar or chocolate powder/ piped cream/ caramelised sugar/ spun sugar/ named aesthetic colour/ texture combinations/ seal/ crimp/ glaze/ evidence of interesting single portion from sketch (1) • **have a three day shelf life** Named place of storage: fridge/ freezer/ chill cabinets because temperature is out of danger zone temperature range 5-63'C to minimise m/o growth/ low risk foods/ covered to prevent cross contamination/ using date marks to accurately rotate stock/ traceability of ingredients from source/ H&S procedures to maximise consumer safety / packaging to extend shelflife/,MAP(1) • **be single portion** Indication of portion size/ weight/measurement of product/ sketched against hand (1) • **be sustainable** Seasonal/local/reducing food miles/reducing packaging/recycled packaging/minimum wastage/ use of cleaning technique for vegetables to minimise water/fair-trade/organic/free range (1)	**[2x8]**


Chilled Layered Desserts.
Design 1 - Lemon cheesecake.
Sliced lemons for finishing pieces.
Lemon flavour (Vitamin C)
Cheesecake layer (Cream cheese)
• Stored in fridge 1°C to 4°C
Digestive biscuit base (Crunchy component)
• Serve as a slice (75g)
Chilled protein component (setting agent / coagulation)
• Cream cheese is sourced from local farmer to reduce air miles (Sustainable).
Design 2.
Crushed almonds (caramelised for crunch)
Piped cream for decoration.
Vanilla custard layer (milk)
Strawberry (Vit C) fruit jelly layer
Setting agent starch gelatinisation in custard component
Amaretti biscuit layer.
Three day shelf life due to M.A.P. material
Sustainable :- Strawberries are summer fruit, seasonal.

13(a)	One from the following: • Peel • Slice • Dice • Chop • Shred • Slice • Mince • Mash • Puree • Blend • Grind • Grate 1 x 1	**(1)**
13(b)	Description: **caramelisation** is when natural sugar(s)(found in onions)(1) are heated/cooked in oil(1) and sugars decomposes (1) to produce a golden brown (1) colour which can improve the flavour (1) and aroma (1) of a component. (2x1)	**(2)**
13(c)	Two advantages: • Extends storage life of product • Improves product safety – bacteria remain dormant • Flavour development increases • Increases versatility of product • Meet consumer demand • Use seasonal ingredients during cheap and plentiful supply • Allows batch production to take place • Retains nutritional value of foods • Easy to prepare after purchase • Freezing hardens the product, making it easier to store/transport for the manufacturer. **2 x 1**	**(2)**
13(d)	Describe one effect: • Decrease in nutritional value for some cooking methods (1) • Dry cooking methods: BBQ, Grilling: fat melts (1) and reduces total fat content. Some loss of Vitamins A&D (1) • Moist methods of cooking: boiling (1) causes loss of water soluble vitamins (B & C) (1) • Frying in fat or oil (1) increases total fat content due to cooking medium (1) • Braise, stew, casserole, soup uses leached vitamins B & C (1) in cooking stock/ gravy / sauce and can retain some nutritional value (1) • Carbohydrate (starch and fibre) soften on cooking in moist heat (1) making it edible (1) • Protein ingredients coagulate (set) (1) but the nutritional value remains constant (1) • Microwaving can be used to steam, poach, melt, cook, defrost foods (1) with negligible effect on the nutritional value of foods (1).	**(2)**

13 (e)	Describe: • **traceability** where food can be traced or tracked (1) through the supply chain (1) to the point of production and distribution (1) using a database of registered stock (1) to control entry into the food chain(1) and to follow its journey through the production process to point of sale.(1)	**(2)**
13(f)	Explanation from the following: (i) **Contains a range of flavours and textures** • Meat: seasoned beef with soft succulent texture • Bolognese sauce: rich sweet tomato sauce flavoured with herbs • Potato: smooth, rich, buttery, creamy mashed potato with crunchy, crispy golden surface. • Gratin: Crunchy, crispy, cheesy, well seasoned breadcrumb layer (ii) **Suitable for young children** • Traditional UK main meal dish(1) with ingredients sourced from UK farms (1) enjoyed by family due to provenance(1) • Soft, mild components (1) decreases choking risk (1) and are easily eaten by younger generation (1) • Well balanced main meal(1) contains CHO, protein, fats, vitamins and minerals in the correct proportion for general heath and well being(1) • Protein in meat layer(1) for growth, maintenance and repair (1) • Carbohydrate (potato) layer is filling(1) and economical (1) and can be decorated/garnished for a pleasing appearance (1) • Ideal for families with limited cookery skills(1) - just defrost and microwave (1)	**(2x2)**

13(g)	Evaluation to include • Most of the protein in this dish comes from meat – animal protein. It could be changed to a quorn/soya/vegetable pie, which is likely to make the dish cheaper when the seasonal vegetables are in cheap and plentiful supply. • The plant protein content in the cottage pie is very low because LBV protein is found in nuts, beans, lentils and pulses. • Animal protein is HBV and has a short shelf life, so is likely to be more expensive. • Plant protein is LBV and tends to have a longer shelf life as they are dried (pulses, lentils need soaking prior to use). This might make the protein cheaper as it is not a standard component. • The cost of plant protein is cheaper than animal protein because crops can be planted and harvested in one season whereas animal protein takes up to 3 years to enter our food chain. • Meat is expensive to produce due to the time, care and effort it takes to rear animals for meat over many years. • After an animal is slaughtered, the carcass is hung, conditioned and butchered over a period of four weeks. Over time the flavour/ texture / quality improves but this increases the overall cost of the meat owing to storing / handling / production costs. • Meat provides HBV protein in our diet, needed for growth, repair and maintenance of the body for all ages. Potatoes are a useful source of LBV protein as a complimentary protein to supplement HBV protein. • With careful meal planning, it is possible to combine LBV foods to create a complementary protein that contains all the essential amino acids that the body needs, which means that this is cost effective. • Large quantities of food (cereals, animal feed and pasture) as well as land and shelter have to be provided and the conversion of these into meat increases the price making meat more expensive to produce than cereals. • Potatoes are grown annually in great quantities in the UK due to the climate, soil and farming methods. These quantities result in them becoming a staple of the UK diet and they benefit from economies of scale. • Potatoes are a useful source of carbohydrate needed for energy. These are called **staple crops** and they are cheap to produce in comparison with protein foods. • As well as the nutritional benefit of combining protein foods, it provides a more varied diet and can save money as LBV proteins are cheaper to produce than HBV proteins. • Manufacturers will often alter % content of protein dependent on price point for product. Value branded items will have a greater % carbohydrate content to make it a more economical meal.	**(6)**

			No reward-able material
	Level 1	1-2	Candidate identifies the areas of evaluation with no development OR identifies and develops one area. Shows limited understanding of the evaluation. Writing communicates ideas using everyday language but the response lacks clarity and organisation. The student spells, punctuates and uses the rules of grammar with limited accuracy.
	Level 2	3-4	Candidate identifies some areas of evaluation with associated developments showing some understanding of the evaluation. Writing communicates ideas using D&T terms accurately and showing some direction and control in organising of material. The student uses some of the rules of grammar appropriately and spells and punctuates with some accuracy, although some spelling errors may still be found.
	Level 3	5-6	Candidate identifies a range of areas of evaluation with associated developments showing a detailed understanding of the evaluation. Writing communicates ideas effectively, using a range of appropriately selected D&T terms and organising information clearly and coherently. The student spells, punctuates and uses the grammar with considerable accuracy.

Question Number	Answer	Mark
14 (a)	Three pieces of information: • Name of the food • Ingredients listed (in descending order of weight) • Additives in the food product • Instructions for use, cooking and storage • Net quantity • Name and address of the manufacturer • Place of origin • Special claims • Processing treatments • Date marks. • Price	**(3)**
14(b)	Explanation: • Aids electronic stock control (1) by giving some product information: name and price (1). • This can be used within traceability systems (1) for food safety, product recall and quality control (1). • Speed at till (1) so cost effective for retailer(1) and convenient for consumer(1) • Informs retailer (1) about spending habits/trends (1)so that they can target their marketing (1) • Speeds up purchasing a food product at the checkout (1) because the bar code contains the EPOS/pricing details to aid stock control and purchase information (1) • Ensures the product has been checked (1) and is safe QC(1) as part of QA(1) (1x2)	**(2)**

14(c)	**Description:** • Tamper-evident seals are used by manufacturers to ensure a food product has not been contaminated or misused (1) by mistakenly opening and resealing foods (1). • The seals also reassure customers (1) and act as a form of QC.(1) • There are a number of different types of seals available: ▪ Plastic collars on bottles e.g. sauces and marmalades (1) ▪ Tear-away strips around the top of bottles e.g. milk and drink products (1) ▪ Tin foil seals in pourable boxes e.g. cartons of juice (1) ▪ Plastic film wraps on cardboard boxes e.g. biscuits, chocolates (1) ▪ Plastic film on ready-meal trays (1) ▪ Jam jar lids with press-to-check feature (1)	**(2)**

14(d)	Description: • Generally short term trials of GM food production (1) so the long term health and environmental effects are unknown (1) ▪ Mutations to crops due to cross contamination(1) permanent, irreversible changes to some plants and animals (1) ▪ The loss of biodiversity (1) and other negative effects on the environment eliminating some wildlife species (1).	**(4)**

14(e)	Discussion: Dehydration • Removal of water through dehydration (drying) of foods to stop microbial growth, which reduces the amount of available water in a food (water activity: aw) through using high concentrations of sugar, salt and dehydration. • Removal of water using sun or spray drying, or AFD (accelerated freeze drying). **Sun**: drying in direct sun light, allows moisture to slowly evaporate (raisins, tomatoes, apricots) **Spray**: a fine spray of the product (milk, eggs, dessert mixes and coffee) is sprayed into a chamber with hot air. **AFD**: Food is quickly frozen and then placed in a vacuum under reduced pressure. This vaporises the ice, turning it to steam, and the food dry. (meat, fruit, vegetables) • **Fluidised bed drying:** Tunnel driers are used with hot air currents (fluidised) being passed over the food. This is also used for solid foods. This stops microbial growth and reproduction. • **Bl**anching (**water, steam or microwave blanching**) vegetables, as a short heat treatment prior to drying, halts enzyme activity/ shrinks the product. • Drying does not kill micro-organisms with just the removal of water, unless very hot temperatures are used in the treatment. • Store in a dry, air tight container for up to 6 months. Contact with moisture will cause clumping and immediate deterioration of food. Canning • Foods preserved by heat to kill micro-organisms and enzymes. Combinations of heat and temperature required to kill micro-organisms. • Food is packed in cans and sterilised or food is sterilised and then packed in aseptic (sterilised) cans. After sterilisation, cans are sprayed with water to cool them down and prevent over cooking. • Acidic foods are canned in plastic lined cans to prevent corrosion. • Blanching (**water, steam or microwave blanching**) vegetables prior to canning halts enzyme activity and aids shrinkage of food product prior to preservation. • Damage to the can will cause corrosion and rusting. A blown can indicates growth of bacteria within a can. • Easy to store canned foods for up to 24 months because cans are sealed with a double seam (tamperproof) to prevent leakage and contamination	**(6)**

		Level descriptor	
		No rewardable material	
Level 1	1-2	Candidate identifies the ways with no development OR identifies and develops one way. Shows limited understanding of the ways. The student uses basic language and the response lacks clarity and organisation. The student spells, punctuates and uses the rules of grammar with limited accuracy.	
Level 2	3-4	Candidate identifies some ways with associated developments showing some understanding of the ways. Writing communicates ideas using D&T terms accurately and shows some focus and organisation. The student uses some of the rules of grammar appropriately and spells and punctuates with some accuracy, although some spelling errors may still be found.	
Level 3	5-6	Candidate identifies a range of ways with associated developments showing a detailed understanding. Writing communicates ideas effectively, using a range of appropriately selected D&T terms and organising information clearly and coherently. The student spells, punctuates and uses the grammar with considerable accuracy.	