Mark Scheme (Results)

Summer 2017

Pearson Edexcel GCE
In Design and Technology (6FT02)
Paper 1 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(a)	One point for each: (i) Meat – slicing (1), dicing (1), grinding (1), mincing (1), chopping (1), shredding (1) (ii) Cereals – milling (1), grinding (1) (2 x 1)	**(2)**
1(b)	Description from following: Caustic soda solution (1) dissolves walls of cells in peel (1) peel disintegrates (1) removes peel and bruised tissue (1) lye neutralised with citric acid solution (1) (2 x 1)	**(2)**
1(c)	**One** description from the following: 1. Premixing (1) of small components (1) with some of larger component (1) 2. Use particles of similar size (1) prevent demixing (1) 3. Use of ribbon blender (1) displace parts of mix(1) 4. Use of tumbler mixer (1) agitation (1) (2 x 1)	**(2)**
	Total for question	**(6)**

Question Number	Answer	Mark
2(a)	AUTOMATED PRODUCTION 1. Probe thermometer (1) test core temp above 72^0 for hot food / below 5 for cold products. (1) 2. Random sampling (1) verification (1) 3. Use of digital displays (1) ovens/fridges/freezers (1) 4. Regular checks by staff (1) temperature readings (1) 5. Sensors (1) measure temperature (1) DISTRIBUTION: 1. Alarms (1) if temperature increases (1) 2. Sensors (1) measures temperature (1) 3. Computer control (1) regulates temperature (1) ACCEPT "sensors" once only 2x2	**(4)**
2(b)	Any **three** of the following: 1. Physical condition / no damage (1) 2. Size/weight/volume (1) 3. Colour (1) 4. Presence of foreign bodies (1) 5. Date marks (1) 6. Shelf life (1) 7. Microbial content(1) 8. Packaging (1) 9. Documentation(1)	**(3)**
2(c)	**Four** of the following: 1. form part of quality assurance (1) consumer confidence (1) 2. trace / identify source of faulty products (1) remove quickly from food chain (1) 3. cost impact (1) minimise recall (1) increase documentation (1) 4. form part of legal defence (1) show due diligence (1) Maximum 2 marks for a list (4 x 1)	**(4)**
	Total for question	**(11)**

Question Number	Answer	Mark
3(a)	**Two** descriptions from the following: 1. Colour change / browning (1) e.g. desirable in meat / baked products (1) undesirable discolouration in dried milk during storage (1) 2. Improves flavour (1) meat extracts/biscuits/breakfast cereals (1) 3. Adds aroma (1) during roasting/baking/toasting (1) e.g. coffee/nuts (1) (2 x 2)	**(4)**
3(b)	Any three from the following points: (i) Salad dressing 1. Thixotropic (1) thins on agitation (1) easy removal (1) 2. Aids thickening / viscosity (1) due to stabilising effect (1) 3. Rapid flavour release (1) because of increase in surface area (1) (ii) Ice-cream 1. Rapid flavour release (1) because of increase in surface area (1) 2. Stabilises / improves freeze thaw stability (1) prevents large ice crystals forming (1) Improved sensory characteristics (1) improved creaminess / smooth texture / good mouthfeel (1) improves melt resistance (1) Do not accept rapid flavour release twice. (2 x 3)	**(6)**
	Total for question 3	**(10)**

Question Number	Answer	Mark
4(a)	One point for each part: i) Essential fatty acid 1. Cannot be made by the body (1) 2. Needed for maintenance of cell membranes (1) 3. Reduce blood clotting (1) ii) Saturated fatty acid 1. All single bonds (1) between carbon and hydrogen atoms (1) 2. High melting point (1) 3. Found in animal fats (1) 4. Resistant to rancidity (1) 5. Linked to CHD/CVD/strokes (1) iii) Diglyceride 1. One molecule of glycerol combined with two molecules of fatty acids (1) 2. Can be used as an emulsifier(1) (3 x 1)	**(1)** **(1)** **(1)**
4(b)	Any four of the following: 1. Oil, which is high in unsaturated fatty acids (1), is heated (1) in sealed vats/under pressure (1) 2. Catalyst (nickel) (1) speeds up reaction (1) 3. Hydrogen is added (1) taken up by double bonds (1) 4. Unsaturated fatty acids become saturated (1) creates a solid fat/oil is hardened (1) 5. Converts *cis* unsaturates (1) to *trans* unsaturates (1)	**(4)**
4(c)	Any four linked responses: 1. Absorbs oxygen (1) so unavailable for oxidative rancidity (1) in unsaturated fatty acid (1) 2. Prevent formation of free radicals (1) by forming stable radicals (1)	**(4)**
	Total for question	**(11)**

Question Number	Answer	Mark
5(a)	Any **four** points from the following: 1. Can enter food premises at any time (1) to inspect premises/ processes/records(1) 2. Detain /seize suspect food (1) 3. Serve improvement notice (1) for breach of hygiene regulations (1) 4. Emergency prohibition notice (1) if imminent risk to health (1) premises closed immediately (1)	**(4)**
5 (b)	pH 1. Bacteria prefer neutral pH / pH 7 (1) 2. Bacteria cannot grow below pH of 3.5/Bacterial growth is inhibited by addition of an acid (1) 3. Spores cannot develop in acid conditions (1) 4. Moulds (1) and yeasts (1) prefer acid conditions / pH 4 (1) 5. Moulds and yeasts won't grow if pH below 2(1) 6. Microbial growth does not occur in alkaline conditions/above pH 7 (1) Oxygen 1. Aerobic bacteria need oxygen (1) 2. Anaerobic bacteria grow without oxygen (1) 3. Moulds are aerobic (1) require oxygen for growth (1) 4. Yeasts can be aerobic (1) and anaerobic (1) Water activity 1. Bacteria require moisture (1) 2. Cannot multiply if water activity (A_W)below 0.6 (1) 3. Moulds can grow with very little moisture (1) 4. Yeasts need moisture for growth (1) (3x3)	**(3)** **(3)** **(3)**
	Total for question 5	**13**

Question Number	Answer	Mark
6	Any three points for each process GELATINISATION 1. Starch is added to liquid (1) 2. Heated (1) starch granules swell (1) 3. At 60^0 (1) viscosity increases (1) 4. At 80^0 (1) starch granules split (1) and disperse into liquid (1) 5. Mixture thickens (1) and forms a solid (1) 6. On cooling (1), forms a gel (1) CARAMELISATION 1. Sugar heated to high temp (1) sugar molecules breakdown (1) 2. Produces brown substances /caramel (1) 3. Can occur with or without water/in dry or moist heat (1) COAGULATION 1.Primary structure of protein remains unchanged (1) 2.Secondary structure of protein breaks down (1) protein denatures (1) 3.Changes from soluble(1) to insoluble (1) 4.Unfolded molecules bond together (1) food hardens / sets (1) 5.Usually irreversible (1) (3x3)	**(3)** **(3)** **(3)**
	Total for question 6	**9**

Question Number	Answer	Mark
7	FROZEN FOODS: **RIGID PLASTIC** ADVANTAGES 1. Not permeable (1) no moisture loss(1) flavour exchange (1) 2. Resistant to temperature change (1) 3. Can be moulded(1) prevent gaps (1) lead to sublimation of ice/frost inside package (1) 4. Suitable for heating in microwave(1) DISADVANTAGES 1. Split if stored long term(1) **PLASTIC FILM** ADVANTAGES 1. Good heat sealing (1) prevent moisture loss(1) 2. Resistant to low temperature (1) no deterioration (1) DISADVANTAGES 1. Not resistant above 90^0 (1) remove before heating (1) 2. Poor oxygen barrier (1) oxidative rancidity (1) **PAPER / CARD** ADVANTAGES 1. Microwaveable (1) reheat from frozen (1) 2. Good conductor of heat (1) heat quickly DISADVANTAGES 1. Absorbs moisture (1) needs wax coating (1) 2. Damaged by high temps (1) needs plastic coating (1) 3. Permeable (1) lead to freezer burn / surface dehydration (1)	(10)

	FOIL ADVANTAGES 1. Conducts heat (1) reheat quickly in oven (1) DISADVANTAGES 1. Unsuitable for reheating in microwave(1) **GLASS** ADVANTAGES 1.Rigidity retains shape of product (1) 2. Freezer to table is good for serving (1) DISADVANTAGES 1. Unsuitable for any food with a high moisture content as water/ice expands whilst freezing (1) 2. Density slows down rate of freezing (1)	
	Total for question	**(10)**

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