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Mark Scheme (Results)

Summer 2016

Pearson Edexcel GCE
in Design & Technology (6FT02/01) Paper 1

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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)	Any **two** of the following examples from : • Dirt / earth / oil/ dust • Pesticides / insecticides / herbicides • Fertilisers • Stones /string /plastic / litter • Weeds / plant materials/ fungi • Metal /oil/grease/loose nuts & bolts • Insects/ other pests/excreta 2x1	**(2)**
1(b)	NAME – Spray washing (1) DESCRIPTION – small volume of water used (1) at high pressure (1) force of spray cleans the food (1)/ conveyor belt OR NAME – Flotation washing (1) DESCRIPTION – food passes through weirs (1)is forced under water (1) by rotating paddles (1) different buoyancy(1) of food and contaminants (1) sink to bottom	**(3)**
1(c)	Any **three** of the following: • Reduces size of fat globules (1) • Fat globules are more evenly distributed (1) • Prevents separation of fat layer (1) • Creates an emulsion (1) • Give same composition/texture throughout (1) • Fat globules are more stable/ preventing movement / coalescing (1) • Consistency of flavour/taste (1)/ better mouth feel • Consistency of appearance • Extends shelf life • Limit rancidity	**(3)**
1(d)	Any **two** of the following: • Photoelectric cells (1) compare colour within a range (1) • Use of colour charts (1) against standard colour background (1)/ falls within tolerance • Random sampling (1) to ensure batch is correct / prevent wastage (1) • Visual check (1) from field to point of sale (accept ripening, preparation, processing, storage, point of sale) (1) • Sensors during CAM (1) Rejected by blast of compressed air if they don't match (1)	**(2)**
	Total for question 1	**(10)**

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>2(a)</td><td>
<table>
<tr><th>Carbohydrate</th><th>Example</th><th>Source</th></tr>
<tr><td>Monosaccharides</td><td>(i) Glucose (1) fructose (1)</td><td>Found in fruits</td></tr>
<tr><td>ii) Disaccharides</td><td>Lactose</td><td>Found in milk</td></tr>
<tr><td>Simple polysaccharides</td><td>(iii) Starch (1) cellulose (1) glycogen (1)</td><td>Found in cereals</td></tr>
<tr><td>Complex polysaccharides</td><td>Pectin, Gums</td><td>Fruits/ named Fruit (1) vegetables / named vegetable (1) plants / cell walls (1) seaweed (1) moss (1) jam (1)</td></tr>
</table>
</td><td>(4)</td></tr>
<tr><td>2(b)</td><td>Any four of the following:
• Absorbs water (1)
• Binds up water (1)
• Prevents formation of large ice crystals (1)
• Slows down thawing /melting (1)
• Prevents drip (1)
• Gives body to the product (1) Gives viscosity
• Improves smoothness of texture (1) mouthfeel
• Acids emulsification</td><td>(4)</td></tr>
<tr><td></td><td>Total for question 2</td><td>(8)</td></tr>
</table>

Question Number	Answer	Mark
3(a)(i)	Any two of the following: • Staphyloccus aureus (1) • Ecoli (1) • Clostridium perfringens (1) • Clostridium botulinum (1) • Bacillus cereus (1) • Salmonella (1) • Campylobacter (1) • Listeria (1) • Bacteria (1) • Mould (1)	**(2)**
3(a)(ii)	Any one answer to a linked response: • Frequent hand washing in hot soapy water (1) before handling food / after using toilet/after handling raw meat/ after coughing/sneezing/smoking (1) to reduce any bacterial population / to prevent cross-contamination to food (1) • Wear protective clothing/ any named specific example (1) to prevent cross-contamination to food (1) • Cover cuts/grazes/boils (1) to prevent cross-contamination to food (1) • Clean and short fingernails (1) to prevent cross-contamination to food (1) • Tie hair up / cover hair (1) to prevent cross-contamination to food (1) • No jewellery (except wedding ring) (1) to prevent cross-contamination to food (1) • No smoking (1) to prevent cross-contamination to food (1) • Don't handle food/report to employer if have diarrhoea / vomiting / septic wounds / skin infection (1) to prevent the transfer / spread of infection to the rest of the workforce (1)	**(2)**

3(b)	Any **five** of the following: • Increase in food outlets (1) • Increase in communal feeding (1) • Meals eaten away from home (1) • Wide menus (1) • Demand for fast food / rapid service (1) • Eat more takeaways(1) • More food is prepared away from the kitchen/others (1) • Many foods being kept warm for too long (1) • Inaccurate / misunderstanding of how to cook food correctly (1) • Increase in intensive farming (1) • Increase in use of convenience foods not properly prepared at home (1) • Insufficient thawing of frozen foods (1) • Consumer not following re-heated instructions(1) • Consumer not following storage instructions/Inaccurate food storage(1) • Confusion by consumers regarding date marks(1) • Insufficient training given to catering staff / chef (1)/ Education of basic hygiene • Lack of basic cooking skills for some groups of population (1) • Better reporting (1) • Greater public awareness (1) • Increased globalised food market (1) Imported food that have not been washed/ stored properly • Improved laboratory identification techniques(1) • Chemical contamination from pesticides/cleaning materials(1) • Lack of clean water in developing/poor countries (1)	**(5)**
	Total for question 3	**9**

Question Number	Answer	Mark
4(a)	Any **four** of the following: • Sugar or salt (solution is concentrated) (1) leads to osmosis (1) • Water (1) passes out of cells(1) into the salt or sugar (solution)(1) • The cell becomes dehydrated / lacks water / Water activity is reduced to below 0.6 (1)	**(4)**
4(b)	Any **six** of the following: • Some bacteria like cold conditions / psychrophiles (1) lead to microbial growth(1) in high risk foods (1) • Enzyme activity (1) lead to enzymic browning (1) • Incorrect storage (1) lead to Cross contamination (1) • Incorrect packaging (1) lead to dehydration/ increase in moisture / transfer of odours (1) • Growth of mould (1) moist conditions(1) • (Hydrolytic) rancidity (1) presence of moisture (1) • Exposure to oxygen (1) leads to oxidative rancidity	**(6)**
	Total for question 4	**(10)**

Question Number	Answer	Mark
5 (a)	Any **one** of the following: • Breakfast cereals (1) - Vitamins/ minerals added to improve nutritious status of breakfast • Dried milk (1) - Vitamins A and D added (1) to replace those lost during the removal of fat during the skimming process (1) • White flour (1) - Vitamin B group iron and calcium added (1) to improve nutritional status of the population during World War II (1) • Margarine (1) - Vitamins A and D added (1) to enhance the margarine product when compared to butter (1)	**(3)**
5 (b)	Any **four** of the following: • Added to COLD water (1) Gelatin absorbs water (1) and swells (1) • Protein molecules (1) form a 3D network(1) • Water is held within the network (1) water is bound by hydrogen bonding (1) • On heating (1) gelatin liquefies (1) forms a sol(1) • On cooling (1) molecules unwind (1)cross links form (1) • sol sets /becomes solid (1) gelation(1) Gel is semi rigid (1) • Gel loses rigidity on heating / shaking (1) • Gel formation is reversible (1) if reheated (1) (4x2)	**(8)**
	Total for question	**(11)**

Question Number	Answer	Mark
6(a)	Six points from the following: • Sterilised food /liquid (1) added to sterilised container (1) • Process carried out in sterile environment (1) to prevent entry of micro-organisms (1) • Hermetically sealed (1) in a sterile environment (1) • Food heated to high temp (150^0) (1) for short time (1) • May have steam injected (1) then cooled (1) • Used mainly for liquid foods (1) which are heat sensitive (1) to prevent overcooking (1) e.g. custards, soups, ice-cream mixes (1) • Minimal change to flavour (1) colour (1) nutritive value (1) • Special microfilters used (1) to remove bacteria (1)	**(6)**
6b	Six points from the following: • Electronic sensors (1) to measure variables (1) such as temp/moisture/pH/weight/colour (1) • Biological sensors (1) to measure quality characteristics (1) such as colour/texture (1) sorting and grading (1) • Information gathered/data logging devices (1) compared to product specification (1) • Sensors control production (1) within set tolerances (1) • Products falling below minimum standards (1) are rejected from production line (1) • CCP's are monitored (1) to eliminate risks (1) e.g. storage temp/cooking temp (1)time controls (1) • Metal detectors (1) for quality control	**(6)**
	Total for question6	**(12)**

Question Number	Answer	Mark
7*	Any 10 points from the following: APPLICATION OF HEAT (1) egg white coagulates at 60^{o} (1) egg yolk at 66^{0} (1). Protein in meat shrinks (1). Wheat protein / gluten sets in dry heat (1) improves digestibility (1) Egg becomes solid (1) PRESENCE OF ACID (1) conversion of lactose in milk (1) to lactic acid (1) lowers pH (1). Causes milk protein (casein) to coagulate / set / form a curd (1). Marinating meat (1) to tenderise / soften connective tissue (1) ADDITION OF RENNIN / ENZYMES (1) used in cheese making (1) to coagulate protein and form a curd (1) MECHANICAL ACTION (1) whisking egg white (1) causes **partial** / temporary coagulation (1) protein molecules unfold / secondary and tertiary structure change (1) form a network (1) around air (1) creates / stabilises a foam (1) used in meringues / soufflés (1) ADDITION OF SALT (1)sodium chloride in cooking water (1) boiling eggs (1) prevents egg white loss (1) when shell is cracked (1) salt added in cheesemaking (1) to increase firmness of curd (1) Denaturation occurs best at iso-electric point/ zwitterion (1) protein denature (1) alters properties (1) less soluble, more viscous (1) molecules unfold, come together (1) protein hardens/ sets (1)	(10)
	Total for question 7	**(10)**