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Mark Scheme (Results)

Summer 2013

GCE D&T Food Technology
(6FT02/01)

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Question Number	Answer	Mark
1(a)	Any **three** of the following examples from: pulping **(1)** slicing **(1)** dicing **(1)** milling **(1)** grinding **(1)** shredding **(1)** chopping **(1)** cutting **(1)** grating **(1)** pureeing **(1)** liquidise **(1)** **(3 x 1)**	**(3)**
1(b)(i)	Outline **one** from the following: canning: correct heat penetration **(1)** to avoid bacterial growth / reduce spore activity / prevent food poisoning **(1)** Even heat penetration **(1)** to prevent cold spots / prevent uneven cooking **(1)** contents not under / over processed **(1)** to ensure organoleptic / sensory acceptability **(1)** prevent build up of hydrogen by heat resistant spores **(1)** to prevent cans bulging and bursting **(1)** **(1 x 2)**	**(2)**
(b)(ii)	mixing powdered ingredients: de-mixing **(1)** if food particle size is uneven/inconsistent **(1)** uneven distribution of dried ingredients **(1)** where food particle size/weight/ ratio is inconsistent **(1)** facilitate the mixing process **(1)** prevent the need for premixing **(1)** the mixing process is much easier/simpler/ more effective **(1)** where food particles are the same size **(1)** to ensure quality control **(1)** meet consumer and manufacturer requirements **(1)** reduce manufacturing costs **(1)** avoid the need for premixing **(1)** **(1 x 2)**	**(2)**
1(c)	**Two** from the following: to allow the dispersion **(1)** of two liquids e.g. oil in water/water in oil **(1)** prevent separation (of immiscible liquids) **(1)** after mixing **(1)** allows the use of immiscible liquids **(1)** for improved/different organoleptic/sensory qualities **(1)** allows the use of immiscible liquids **(1)** to extend product range **(1)** **(2 x 2)**	**(4)**
	Total for question	**(11)**

Question Number	Answer	Mark
2(a)	Any **five** of the following from: draw up a production plan **(1)** build a team **(1)** describe the product **(1)** identify the uses of the product **(1)** analysis of the process **(1)** flow diagram of manufacture **(1)** recognise CCPs **(1)** recognise hazards **(1)** decide on target levels **(1)** identify preventative/ control measures **(1)** develop a monitoring system **(1)** establish corrective action **(1)** install a verification process **(1)** development documentation **(1)** develop record keeping **(1)** review the HACCP plan **(1)** *[Any order accepted]* **(5 x 1)**	**(5)**
2(b) (i)	Outline one from the following examples from: It's a quality control check **(1)** ensuring the food's safety/fit for purpose **(1)** To Ensure consumer safety **(1)** through checks at product recall **(1)** Identification **(1)** of the source of the raw ingredients **(1)** Trace or find source **(1)** of any spoilage/contamination **(1)** Provide evidence **(1)** for possible litigation /due diligence**(1)** Bar coding **(1)** for a distribution and recall system **(1)** Tracking food **(1)** through the manufacturing process/field to fork/source **(1)** Saves money **(1)** by early identification of risks **(1)** Reduces wastage **(1)** by early identification **(1)** Improves consumer confidence **(1)** through giving more information **(1)** **(1 x 2)**	**(2)**
2(b) (ii)	One description from: Environmental health officers (EHO) **(1)** randomly inspect all food premises / have the power to close down a premises / have the power to prosecute / order improvements to be made**(1)** EHO Trading standards officers (TSO) **(1)** randomly inspect weights and measures **(1)** Food manufactures have an legal obligation **(1)** to uphold the principals of GMP / have a HACCP plan / to maintain food safety **(1)** **(1 x 2)**	**(2)**
	Total for question	**(9)**

Question Number	Answer	Mark
3(a)	Any **two** of the following examples from: lag phase **(1)** bacterial growth is slow **/** bacteria establishing themselves in food medium **(1)** log phase **(1)** rapid multiplication of bacteria **/** reproduction every 10-20 minutes / due to binary fission **(1)** stationary phase **(1)** growth/death of bacteria is at a constant / depletion of nutrients in growth medium **(1)** death phase **(1)** numbers of bacteria decline / due to death of bacteria / depletion of nutrients **(1)** **(2 x 2)**	**(4)**
3(b)(i)	Any **two** of the following examples from: temperature: optimum growth temperature range **(1)** for most bacteria within 20-40C **(1)** Any temp 72°C **(1)** most bacteria are killed **(1)** Below 0°C **(1)** bacteria start to become dormant Below -18 C most bacteria become dormant **(1)** because water is unavailable / frozen / ice **(1)** Some bacteria can withstand higher temperatures **(1)** because they are thermophilic / spore forming bacteria**(1)** Some bacteria can withstand lower temperatures **(1)** because they are psycropihlic **(1)** Rapid bacteria growth **(1)** between 5 – 63°C / the danger zone **(1)** **(2 x 1)**	**(2)**
(ii)	moisture: An amount of water / water activity **(1)** is required to maintain life / support growth **(1)** Aw of most foods 0.9 **(1)** therefore suitable for growth **(1)** There is no bacterial growth **(1)** in dried foods **(1)** dehydration **(1)** Presence of sugar/salt **(1)** makes water unavailable **(1)** **(2 x 1)**	**(2)**
(iii)	pH: optimum range 6.6-7.5 **(1)** because this is neutral conditions **(1)** low pH / 3.5 /acidity **(1)** inhibits the growth of most bacteria / cell death **(1)** e.g. pickling **(1)** high pH / 8+ (alkaline) **(1)** inhibits the growth of most bacteria **(1)** **(2 x 1)**	**(2)**
	Total for question	**(10)**

Question Number	Answer	Mark
4(a)	**Two examples from** the following: **<u>Simple polysaccharides</u>** starch **(1)** cellulose **(1)** glycogen **(1)** **<u>Complex polysaccharides</u>** Gums **(1)** Xanthan gum **(1)** Arabic gum **(1)** Tragacanth gum **(1)** Locust bean gum **(1)** Guar gum **(1)** Pectins **(1)** Carrageen (carrageenan) **(1)** Alginate **(1)** **(4 x 1)**	**(4)**
4(b)	Any **six** of the following description: The starch needs to be mixed **(1)** with a <u>cold</u> liquid **(1)** At this stage starch take up to 25% **(1)** of its weight in water **(1)** Stirring / agitation **(1)** contributes to a smooth sauce **(1)** starch gradually takes up/absorbs water **(1)** as temperature rises **(1)** at around 60C granules **(1)** swell rapidly **(1)** at around 80C **(1)** starch granules begin to split / burst **(1)** starch molecules released from granules **(1)** mixture thickens**(1)** viscosity of suspension increases **(1)** because of hydrogen bonding / long chain molecules unfold attracting H2O **(1)** on cooling forms a gel **(1)** starch molecules form a network / water trapped in network **(1)** reheating **(1)** breaks down the network **(1)** Amylose thickens **(1)** more easily/quickly than amylopectin **(1)** **(6 x 1)**	**(6)**
	Total for question	**(10)**

Question Number	Answer	Mark
5(a)	**Two** of the following characteristics from: soft fat **(1)** oil **(1)** found mainly in plants **(1)** fish **(1)** all essential fatty acids are unsaturated **(1)** melting point below room temperature / liquid at room temp**(1)** contributes to a healthy diet **(1)** does not contribute to body's cholesterol level **(1)** could pickup hydrogen or oxygen **(1)** hydrocarbon chain is NOT saturated with hydrogen atoms **(1)** one or more double bonds **(1)** **(2 x 1)**	**(2)**
5(b)	Description from**:** oil is heated **(1)** and stirred with a small amount of nickel **(1)** nickel **(1)** is used as a catalyst **(1)** hydrogen gas **(1)** is bubbled through the oil **(1)** unsaturated fatty acids **(1)** take up hydrogen atoms **(1)** removes some of the double bonds **(1)** in the fatty acids **(1)** process results in 'hardening' **(1)** of oils to solid fats **(1)** effectively changes unsaturated fatty acids **(1)** into saturated fatty acids / trans fats **(1)** **(2 x 2)**	**(4)**
(c)	Discussion from: Hydrolytic **(1)** occurs in emulsion systems **(1)** butter/margarine/cream **(1)** brought about by presence of moisture / water in lipids **(1)** hydrolysis of triglyceride molecule **(1)** to form glycerol and free fatty acids **(1)** hastened by presence of enzymes (lipases) **(1)** micro-organisms **(1)** reverse process of esterification **(1)** alters chemical structure **(1)** intense odours **(1)** flavours **(1)** used/desirable in cheese making **(1)** undesirable for butter/margarine/cream **(1)** time requirement **(1)** can occur at low temperatures **(1)** oxidative **(1)** by far the most important type of fat deterioration **(1)** presence of oxygen **(1)** reaction of unsaturated fats with oxygen **(1)** free radicals produced **(1)** presence of initiators heat / UV light / copper/iron **(1)** it needs time **(1)** takes up oxygen slowly **(1)** flavour rancidity **(1)** can occur in quite dry food products e.g. biscuits, crisps **(1)** colour change **(1)** texture change **(1)** **(3 x 1)**	**(6)**
	Total for question	**(12)**

Question Number	Answer	Mark
6(a)	**Two named from:** Pasteurisation **(1)** Bottling **(1)** Canning **(1)** Sterilisation **(1)** UHT **(1)** Aseptic packaging **(1)** **(2 x 1)**	**(2)**
6 (b)	Description from: product free from water / can reach significant low moisture levels **(1)** little or no risk from contamination / reduces micro organism activity **(1)** good re-hydration characteristics **(1)** maintains quality of product **(1)** no case hardening **(1)** maintains quality of product **(1)** few flavour changes/quality improved **(1)** compared to other methods of drying **(1)** minimal colour change **(1)** due to speed of process **(1)** little nutritional loss **(1)** due to speed of process / product free from water **(1)** use of heat **(1)** accelerates the process **(1)** extends shelf life by many months **(1)** reducing wastage **(1)** little or no effect on appearance / damage of product **(1)** retains shape and volume of original product **(1)** sublimation process **(1)** accelerated process **(1)** accelerated process **(1)** facilities luxury dried products **(1)** **(6 x 1)** *[no marks awarded for repetition of a response]*	**(6)**
	Total for question	**(8)**

Question Number	Answer	Mark
***7(a)**	Evaluation from: **Advantages** recyclable **(1)** cheap to produce **(1)** withstands high temperatures **(1)** microwaveable / can be grilled **(1)** cook and serve in container (desserts) **(1)** sustainable **(1)** transparent **(1)** Moulded in to different shapes **(1)** and sizes **(1)** Colours easily **(1)** Used with a metal seal to create tamper proof packaging **(1)** Suitable for long term storage **(1)** Does not affect the flavour of contents **(1)** Strong / durable / protects **(1)** **Disadvantages** Heavy **(1)** Breakable **(1)** Unsuitable for use with frozen foods **(1)** Can't print on it **(1)** Multi material packaging / requires additional packaging **(1)** High transportation costs **(1)** Difficult to stack **(1)** Allows light to enter / UV damage **(1)** *[A minimum of one advantage and one disadvantage must be given for maximum marks]* **(4 x 1)**	**(4)**

7(b)	Discussion from: used to ensure product uniformity **(1)** ensures production efficiency **(1)** scheduling of raw materials **(1)** stock control **(1)** controlling the flow of product through the process **(1)** evaluation / control of the process **(1)** evaluation of product **(1)** making technical decisions / scaling up **(1)** feedback **(1)** sensors required for system to work **(1)** sensors measure process **(1)** variables can be controlled **(1)** any named quality control check **(1)** information stored **(1)** compared with specification **(1)** ensures due diligence **(1)** ensures tracking **(1)** ensures traceability **(1)** workforce labour costs reduced **(1)** health and safety **(1)** 24/7 to meet consumer demand **(1)** alter the production line **(1)** alter speed of production process **(1)** production time reduced due to automation **(1)** prevents faults due to human error **(1)** **(6 x 1)**	**(6)**
	Total for question	**(10)**
	Total Marks for Paper	**70**

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