

Mark Scheme (Results)

Summer 2013

GCE D&T Food Technology
(6FT03/01)

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information, please visit our website at www.edexcel.com.

Our website subject pages hold useful resources, support material and live feeds from our subject advisors giving you access to a portal of information. If you have any subject specific questions about this specification that require the help of a subject specialist, you may find our Ask The Expert email service helpful.

www.edexcel.com/contactus

Pearson: helping people progress, everywhere

Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at:

www.pearson.com/uk

Summer 2013

Publications Code UA035710

All the material in this publication is copyright

© Pearson Education Ltd 2013

Question Number	Answer	Mark
1(a)	Any four of the following: <ul style="list-style-type: none"> • skim milk powder/dried milk/ milk/whole milk/ skimmed milk (1) • water(1) • fat / vegetable fat/ vegetable oil/oil(1) • sugar (1) • stabiliser (1) • emulsifier (1)lecithin(1) • colouring (1) • flavouring (1) • cream (1) • egg(1) <p style="text-align: right;">(4 x 1)</p>	4
1(b)	Any four of the following: <ul style="list-style-type: none"> • pasteurisation (1) • mixing of ingredients (1) • homogenisation (1) • churning / continuous agitation (1) to ensure smooth texture by preventing large ice crystals (1) • freezing (1) (from about -5C (1)) • fast freezing for small ice crystals (1) • whipping in of air/aeration during freezing (1) • hardening (1) (at about -40C (1)) • stabilisers added to prevent large ice crystals(1) <p style="text-align: right;">(4 x 1)</p>	4
Total for question		8

Question Number	Answer	Mark
2(a)	<p>Any two of the following:</p> <ul style="list-style-type: none"> • Retinol/vitamin A (1) - fish liver-oils /liver/cream / butter / milk / cheese / yogurt / margarine / eggs/ dark green vegetables/ carrots/ yellow fruits (1) • Cholecalciferol/vitamin D (1) - fish-liver oils/ butter/ margarine/ cream /cheese /milk / fortified breakfast cereals/oily fish (1) • Tocopherol/vitamin E (1) - vegetable oils/wheat germ/soya bean oil/cereal grain/nuts/margarine/egg yolk(1) • Naphthoquinones/vitamin K (1) - green vegetables/most foods (1) <p>[do not accept dairy foods or any repetition]</p> <p style="text-align: right;">(2 x 2)</p>	4
2(b)	<p>Vitamin B₁</p> <ul style="list-style-type: none"> • works as an essential coenzyme (1) for utilisation of carbohydrates (1) alcohol (1) and fats (1) • for energy release in the body (1) • prevents beriberi (1) <p>Vitamin B₂</p> <ul style="list-style-type: none"> • involved in cell maintenance and repair processes (1) • oxidation-reduction (1) • concerned with release of energy from proteins, (1) fats (1) carbohydrate (1) • assists with normal growth in children (1) <p>Vitamin C</p> <ul style="list-style-type: none"> • essential for formation of connective tissue/ collagen (1) • prevents scurvy (1) • assists the absorption of iron (1) • has anti-oxidant properties / prevents free radicals (1) • Boost immune system (1) • Wound healing (1) <p style="text-align: right;">(3 x 2)</p>	6
Total for question		10

Question Number	Answer	Mark
3(a)	<ul style="list-style-type: none"> • Enzymic (1) and bacterial activity (1) stopped (1) due to low temperature -18C -30C (1) and water removal (1) fish can be kept in good quality from several months to a year/ extends shelf life (1) • Retains nutritional value (1) because the freezing process has little impact on the nutrients (1) • Fat content of the flesh (1) determines the freezer life of the fish due to the possibility of rancidity/oxidation (1) • Fast freezing essential for best quality (1) because small ice crystal limits cell damage/ texture changes (1) and to prevent rapid deterioration of fish immediately after being caught (1) retains flavour compounds (1) • Only freshest fish should be frozen (1) poor quality fish will be poorer after freezing (1) • Frozen fish can be better quality than fresh fish that has travelled (1) 	4
3 (b)	<p>Comparison</p> <ul style="list-style-type: none"> • Both contain HBV protein (1) • No carbohydrate in either (1) • Calcium in variable amounts if bones are eaten (1) • Sea fish (either white or oily) a valuable source of iodine (1) <p>Contrast</p> <ul style="list-style-type: none"> • Polyunsaturated (1) fat (1)/ in oily fish (1) no fat in white fish/ except for the liver (1) • omega 3/ EFAs in oily fish (1) • Fat soluble vitamins (A and D) in oily fish (1) • Oily fish provide more B group vitamins than white fish (1) <p>Maximum of six marks.</p>	6
Total for question		10

Question Number	Answer	Mark
4(a)	<ul style="list-style-type: none"> • Sourced from a variety (1) and quantity / (80 g per portion)(1) of fruit and vegetables per day. • High intake of fruit can lead to tooth decay through high sugar/ fructose level (1). Recommendation -3 vegetables, 2 fruit (1) • Good source of dietary fibre (1) to aid digestive processes (1) adds bulk to the diet / feeling of satiety (1) thought to prevent digestive diseases (1) • Good source of vitamins and minerals (1) named vitamin / mineral (1) prevents named linked deficiency(1) • Believed to help reduce risk of heart disease, stroke and some cancers (1) • Usually low in fat (1) low cholesterol (1) unsaturated fat(1) • Low in calories / energy value (1) • Some have high water content (1) • Believed to help prevent obesity (1) and type 2 diabetes (1) • Contain phyto-nutrients (1) to help fight disease (1) • Low in salt / sodium (1) 	6
4(b)	<ul style="list-style-type: none"> • Used to provide protein alternatives (1) to meat and fish (1) • Examples include mycoprotein/Quorn (1) soya protein/tofu / TVP (1) • Used as a meat extender (1) • To extend the vegetarian market (1) to make vegetarian burgers (1) sausages (1) mince (1) e.g. in vegetarian Bolognese sauce / other traditional meat sauce / casserole (1) fillets (1) pieces (1) • To provide vegetarian products which have similar sensory attributes/ taste, texture and appearance of meat (1) • To provide a low fat alternative (1) to traditional meat based (ready) meals(1) • To provide alternative to meat for those worried about food scares (1) • TVP can be used to reduce the cost of ingredients in products (1) 	6
Total for question		12

Question Number	Answer	Mark
5	<p>The response should focus on the fact that egg proteins coagulate, foam, emulsify and can brown in the Maillard reaction</p> <p>Coagulation (1) caused by heat (1) yolk 70°C (1) white 63 °C (1) agitation (1) to:</p> <ul style="list-style-type: none"> • thicken (1) sauces, custards, soups (1 mark max for an example) • Set (1) - quiches, custards, cakes, puddings. (1 mark max for example) • Bind (1) – stuffings, rissoles, (1 mark max for example) Do not accept binding when this focuses on the liquid content of the egg rather than the coagulation properties. • Coat/ Enrobe (1) – breadcrumbs, batters. (1 mark max for example) • Foaming (1) capacity to hold air (1) e.g. meringues, soufflés, sponge cakes. (1 mark max for example) • Emulsifying (1) – lecithin in egg yolk (1), mayonnaise, cakes. (1 mark max for example) • Glazing due to Maillard reaction (1) protein reacts with carbohydrate (1) browning reaction (1) pastry, pies, scones, (1 mark max for example) • Egg proteins can be denatured (1) and this is irreversible (1) 	8
	Total for question	8

Question Number	Answer	Mark
6	<p>Any 10 from the following: Genetically modified crops are those whose genetic material has been altered (1) or to which DNA has been added (1)</p> <p>advantages:</p> <ul style="list-style-type: none"> • reduce use of chemicals (1) • environmentally friendly (1) • improved agricultural performance (1) • ability to grow in adverse conditions (1) e.g. drought (1) • ability to grow out of season (1) • greater yields (1) boost to economy (1) • improved sensory characteristics (1) • improved nutritional status (1) mark for specific named example (1) • reduced wastage (1) • possible ability to feed growing world populations/(1) • possible ability to prevent starvation/ solve world hunger (1) • ability to resist pests, weeds and disease (1) • ability to stay ripe for longer (1) therefore longer shelf life (1) • Traditional selective breeding can take many years (1) GM can achieve changes in a couple of generations (1) <p>disadvantages:</p> <ul style="list-style-type: none"> • Emotive/ controversial issue / not natural (1) therefore consumers won't buy/ avoid GM crops(1) • long term effects on health (1) or the environment (1) not known(1) • possible cross-pollination to weeds (1) resulting in 'super weeds'(1) • possible contamination of organic crops (1) or non GM crops (1) • possible production of toxins (1) • encouraging the emergence of new pathogens eg bacteria (1) • Could cause allergies in humans (1) • Expensive – poor countries cannot / struggle to afford it (1) Control of crops may be limited to large companies who can afford the process (1) <p>[Must have minimum one advantage / disadvantage]</p> <p>(10x1)</p>	10
Total for question		10

Question Number	Answer	Mark
7(a)	<ul style="list-style-type: none"> • Milk is pasteurised (1) – to destroy pathogens (1) • Cooling (1) – to provide the optimum temperature for bacterial growth (1) 40 – 44 C (1) • Addition of starter (1) – Lactobacillus bulgaricus and Streptococcus thermophilus (1) (<i>note both must be mentioned for one mark</i>). These will grow over the incubation period (1) and ferment the lactose (1) to lactic acid (1). • The increase in acidity/ decrease in pH (1) will coagulate the protein (1) and thicken the texture (1) (to get the mark from ‘thicken’, coagulation of protein must be mentioned) • The fermentation also produces diacetyl (1) and acetaldehyde (1) which gives yogurt its characteristic flavour (1) • Cooling (1). The yogurt is cooled to 5 – 8 C (1) to retard any further growth of micro-organisms. (1). • Reduced pH retards / prevents microbial growth (1) • Set yogurt – fermentation takes place in the container in which the yogurt is sold (1) • Stirred yogurt - is fermented in bulk then packaged later (1) incubation is at a lower temperature so that the yogurt becomes thicker but not coagulated (1) continuous stirring ensures no curd is formed (1) <p>To achieve the marks, the stages must be explained.</p>	6
7(b)	<p>Discussion could include</p> <ul style="list-style-type: none"> • Mould growth on cheese could be unwanted causing spoilage of the cheese (1) However... • Types of moulds specially introduced (1) in cheese production are penicillium roquefortii (1) and penicillium camembertii (1) • Moulds produce proteolytic enzymes (1) breaking down proteins (1), producing ammonia (1) giving the characteristic flavour (1) and smell (1) • Other enzymes produced are lipases (1) which attack and break down the lipids (1) causing some fatty acids to be released from the fat which contributes to the flavour (1) • Penicillium roquefortii produces blue colour (1) of cheeses such as stilton or Danish blue (any named blue cheese) (1) • Penicillium camembertii produces white growth (1) Enzymes from this mould act on the curd (1) to produce the soft and creamy texture (1) of cheeses such as brie or camembert (1) <p>1 mark maximum for simply stating that moulds cause colour, texture, flavour and aroma if no further explanation given.</p>	6
Total for question		12

Further copies of this publication are available from
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467

Fax 01623 450481

Email publication.orders@edexcel.com

Order Code UA035710 Summer 2013

For more information on Edexcel qualifications, please visit our website
www.edexcel.com

Pearson Education Limited. Registered company number 872828
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE

Ofqual




Llywodraeth Cynulliad Cymru
Welsh Assembly Government

