MARK SCHEME for the October/November 2013 series

9336 FOOD STUDIES

9336/01

Paper 1 (Theory), maximum raw mark 100

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

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		GCE A LEVEL – Octo	ber/November 2013	9336	01
1 (a)	Anaemia Causes Iron defii lack of v blood los destructi iron need to transp low haer <u>Megalob</u> Impaired Fewer / I so less o <u>Pernicion</u> lack of ir B12 not Sympto pallor - Remedia sources green ve sources sources max of 1 Do not a	<u>ciency anaemia</u> - lack of iron itamin C - ss - e.g. surgery / childbirth on of red blood cells - ded for formation of haemog ort oxygen - to oxidise gluo noglobin - less oxygen - le <u>lastic anaemia</u> - lack of fola I DNA synthesis – prevents of arger - irregular-shaped re- oxygen carried <u>us anaemia</u> otrinsic factor in gut needed f absorbed ms tiredness - dizziness - hea es of iron - e.g. red meat / dar cereals / dark chocolate etc. of vitamin C - e.g. citrus fru- egetables / peppers etc. of folate - e.g. green vegeta of vitamin B12 - e.g. meat / food example for each corre- ccept supplements	n-providing foods - / menstruation etc lobin - in red blood cells cose in cells - to release e ss energy released ate and vitamin B12 cell division d blood cells for absorption of vitamin B adaches etc. k green vegetables / eggs it / blackcurrants /- ables / liver / yeast extract / milk ect nutrient	- energy 12 -	
	10 points	s covering all areas	2 points = 1 mark		[5]
(b)	Osteopo Causes loss of a particula linked to not caus Sympto loss of b bones be Remedie Phospho plenty of cereals vitamin I fish liver regular e adequate to ensure	rosis Il bone components - esper rly women - after menopau reduced productions of oes ed by a lack of calcium - or ms one density - shrinkage in l ecome porous - fracture mo es prpous – in all foods f dietary calcium - from m / white bread etc. D for calcium absorption - n oil / margarine / butter / sun exercise - as preventive me e supply of calcium at young e bones are strong	cially calcium - in old peo use - body draws calcium trogen - vitamin D neight - aches in bones - pre readily ilk / cheese / green ve nilk / cheese / oily fish / shine etc. asures - ler age -	ople over 50 - from the bones i	- ified breakfast
	10 points	s covering all areas	2 points = 1 mark		[5]

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(c)	Goitre Causes insufficie common where so needed k involved Sympton enlargen Remedie use of io sea fish seaweed	nt intake of iodine - in areas a long way from the sea bil contains little iodine - by the thyroid gland - for formatio in the regulation of the rate of oxio ms hent of thyroid gland - es dised table salt - has potassium i y salt water fish - vegetables grow etc.	- n of thyroxin - a hor ation of nutrients in b odide added - n near the sea -	mone oody cells	
	10 points	covering all areas 2 po	nts = 1 mark		[5]
(d)	Night blir Causes lack of vi visual pu which he Or (Not a Sympton vision in	ndness tamin A (retinol) - needed to syn rple - a light-sensitive pigment - lps eyes to adjust to dim light - awarded twice) ns dim light is impaired -	hesise rhodopsin - in retina of the eye	-	
	Remedia Animal for fish liver plants - o which ca but is on found in e.g. carro	es bod - foods rich in vitamin A includ oil / margarine etc. contain beta-carotene - n be converted into vitamin A in th ly one sixth as valuable as consur orangey-red fruits and vegetables ots / papaya / red peppers	e milk / cheese / butt e body - ning vitamin A -	er / egg yolk /	
	Max 1 fo Max 1 fo	od for retinol			
	10 points	covering both areas 2 po	nts = 1 mark		[5]
(e)	Scurvy Causes vitamin C formation to oxidise needed f main pro	C (Ascorbic acid) deficiency - new of haemoglobin - transport oxyge glucose - and release energy - or the formation of collagen - tein of connective tissue - protec	eded for absorption o en from lungs to cell s organs -	f iron s -	

Page 4	Μ	lark Scheme	Syllabus	Paper	
-	GCE A LEVEL -	- October/November 2013	9336	01	
Sympton spontane become l teeth bec caused b may also inability t	ns cous bruising - as si black - and spongy / come loose - wounds by failure to form conr have anaemia - fail o form red blood cells	mall blood vessels break - hae /swollen gums s heal slowly - fractures slow to hective tissue - lure to absorb iron - s - change in bone structure	morrhaging under o heal -	r skin - gur	
Remedia regular in e.g. blac peppers, take care water sol oxidises some foc read pac	es take important since kcurrants, citrus fru new potatoes to avoid loss of vitar uble - destroyed by etc raw fruit and v ods are fortified with v kaging to compare wit	vitamin C cannot be stored in th it, rose hips, melon, strawber min C when preparing, cooking heat - egetables contain most vitamin itamin C - some fruit juices etc ith RDI etc.	ne body - rries, green vege and serving greer C - c. –	etables, gre n vegetables	
Max 1 foo	od example				
10 points	covering all areas	2 points = 1 mark			
(a) <u>Digestion</u> Duodenu <i>Protein</i> trypsinog become t trypsin c <u>Fat</u> bile - m increases lipase - and glyce <u>Carbohy</u> amylase	n of food in the small i um trypsin - converts protein into p ade in liver - stored s surface area from pancreatic juice erol <u>drate</u> - from pancreatic juice	intestine c juice - is activated by entero peptides in the gall bladder - emulsifies - converts fat to fatty acids - ice - converts starch to maltose	kinase - in intest s fat/ breaks into s e -	inal juice - mall droplet	
Ileum <u>Protein</u> erepsin - from intestinal juice - converts peptides to amino acids - <u>Fat</u> lipase - from intestinal juice - completes breakdown of fat into fatty acids and glycer <u>Carbohydrate</u> intestinal juice - contains maltase - converts maltose to glucose - lactase - converts lactose to galactose and glucose - sucrase / invertase - converts sucrose to glucose and fructose -					
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Page 5	Mark Scheme	Syllabus	Paper
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(b) <u>Absorption</u>	on of nutrients in the ileum		
Protein			
amino ac villi - the	cids absorbed through microvilli - by active transport en to liver - via hepatic portal vein	i - into blood c	apillaries - of
<u>Fat</u>			
glycerol lymphati	and fatty acids - reform into fats - in walls of villi - j c system - by diffusion - and active transport - now	called chylomic	- then into crons
<u>Carbony</u>	<u>arate</u>		
villi - fin	ger-like projections - increase surface area of ileum	-	
(can sno	w on a diagram) - well supplied with blood capiliaries	-	
monosad	ccharides (glucose, galactose, fructose) absorbed dire	ectly into bloods	tream - pass
to liver -	via nepatic portai vein		
<u>Minerais</u>	ut one third of colorisms is choosehod		
only abo	ut one third of calcium is absorbed -	orntion otherwise	
remainue he choor	er is lost from the body in faeces - vitamin D alus abs	orption otherwise	
	id and ovalia acid react with calcium		
priyuc ac	au - and Oxanc aciu - react with calcium -		
	ut 5% 20% iron is absorbed		
depends	on the body's need for iron -		
depends	on the form of iron - haem iron - ferrous -		
more ea	silv absorbed - non-haem iron - ferric -		
can be re	educed to ferrous - by vitamin C - so aids iron absor	ntion -	
phytic ac	id - oxalic acid - and tannin - reduce iron absorptic	n	
Vitamins			
vitamin A	and vitamin D are fat soluble - absorbed with fat		
N.B. Avc	oid crediting some information more than once e.g.		

villi - liver - hepatic portal vein etc. 26 points

2 points = 1 mark

[13]

Page 6		ge 6	Mark Scheme Syllabus Paper				
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•							
3	(a)	Characte	eristics of fats and or	Is and uses in preparation of dishe	<u>IS</u>		
			eristics	action botwoon coids and clockal			
		2 hydrox	esters - result or rea	action between actus and accord	- vith a fatty acid r	noloculo to	
		aive a tri	iglyceride - a type c		and a fatty actual		
			vecule could have m	ore than one type of fatty acid - d	lycerol common	to all	
		differenc	e between fats and	oils due to different fatty acids in co	omnosition -		
		saturate	d fatty acids - all ca	when molecules saturated with hyd	Irogen - hard -		
		all c-c bo	ands within molecule	are single -	nogon nara		
		monoun	saturated - one dou	uble bond between adjacent carbor	n atoms -		
		can take	up more hydrogen	- soft fat -			
		polyunsa	aturated - more that	n one double bond between adjace	ent carbon atom	S	
		can take	up more hydrogen	-			
		saturated	d fats usually from a	nimals - polyunsaturated usually	from plants		
		fish oils a	are unsaturated -				
		double b	onds are a point of v	weakness -			
		can read	lily be broken by a ra	ange of substances -			
		Max 4 fo	r correct diagrams				
		cis fatty	acids - hydrogen at	toms on same side of double bond	-		
		trans tati	ly acids -	annopite and other at double have		CDIT in (a)	
		nyarogei	n atoms diagonally d	opposite each other at double bond	I - DU NUT CR	EDIT In (a)	
		anu (b)	we come of this infor	mation in a diagram)			
		fats molt	over a range of tem	ination in a diagram) ineratures - depending on fatty ac	ide -		
		as temp	erature rises some f:	atty acids will melt - others remain	n solid -		
		this allov	vs solid trialvcerides	to move within the fat - fat is spre	eadable -		
		softer fat	ts spread more read	ilv - shape changes with pressure) -		
		plasticity	of fat affects cream	ing and shortening properties -			
		pure fats	such as lard have r	nore shortening power than butter	or margarine -		
		because	they contain water	-	C C		
		creaming	g power of a fat is m	easured by its capacity to incorpor	ate air bubbles		
		a fat with	n a wide plastic rang	e is best for creaming -			
		hydrogei	nated vegetable fats	are better than butter -			
		butter ha	as a narrow plastic ra	ange -			
					<i>.</i> .		
		fats and	oils have different si	moke points - high smoke point fo	or frying -		
		otherwis	e food will absorb fa	t or oll -			
		almerent	Tatty acids have diffe		y - ing stagaa		
		to give d	losirod bardnoss for	intended use etc	ing stages -		
		lo give u	ts should not be crow	dited in section (a) and (b)			
		ιαδί μοιτι					
		Uses					
		spreadin	ıq - flavouring - for	rming an emulsion - shortening -	aeration - fryir	ng - adding	
		colour -	0 0	5	,	5 5	
		improvin	g keeping quality -	emulsifies with moisture - to retai	in moisture - e.	g. in rich	
		cakes				-	
		1 use + 1	1 fat example = 1 ma	ark			
		increasir	ng calorific value with	nout adding bulk - e.g. fried foods	etc.		
		sealing	 melted butter on p 	ate sets on cooling - prevents su	rface drying -		
		lubricatio	on - prevents food s	sticking to cake tins etc			
		makes for	ood easier to eat - e	e.g. butter on bread compared with	dry bread etc.		
		Max 5 fo	r characteristics				
		Max 5 fo	r uses of fat			-	
		20 points	5	2 points = 1 mark		[10]	

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(b) (i)	Ran refer hard cont fish give caus acce oxid anti- e.g. enzy unpl	<u>cidity</u> rs to the spoilage of fats and oils - fats are resistant to oxidative rancidity - ain fewer double bonds - oils are highly unsaturated - e susceptible to this type of rancidity - unpleasant odour - and flavour - sed by formation of aldehydes and ketones - elerated by heat - light - traces of metals e.g. copper ative rancidity produces free radicals - oxidants absorb oxygen - prevent formation of free ra vitamins A, C and E - mes / lipase hydrolyses fats - breaking them down to easant taste of rancid butter due to the fatty acid butyr	9336 , iron - adicals - glycerol and fa ic acid -	01 tty acids
	can	be reduced by storing in a cool, dark place - non-met	al container	
	6 po	ints 2 points = 1 mark		[3]
(ii)	Smoothe p beca depe or th irrev deep heat flavo free brea 6 po	oke pointpoint at which a fat or oil begins to decompose - ause the temperature is too high - ends on the percentage of free glycerol within the fat - ne ease with which fats are hydrolised to release glycer ersible - smoke point will affect choice of fat for deep p frying needs a fat or oil with a higher smoke point - ing above smoke point causes fats and oils to ignite - bur and smell affected - bitter flavour - acrid smell - fatty acids reduce the temperature of the smoke point kdown of glycerol leads to acrolein - irreversible ints2 points = 1 mark	ol - frying - acrolin -	[3]
(iii)	Hydr proc vege unsa degr can or ci rese asso to gi by a use do n	rogenation ess by which oils are converted into fats - etable oils are more readily available in some countries aturated fats become saturated - ree of hydrogenation can be controlled - nickel catalys be trans fatty acids - hydrogen atoms opposite at dou s fatty acids - hydrogen atoms on same side of doubl arch has shown that trans fatty acids are more unheal ociation with cholesterol - and CHD ve fats with different degrees of hardness ddition of hydrogen - across a double bond - in the manufacture of margarine and cooking fats ot credit same pts as in a e.g. trans and cis fatty acids ints 2 points = 1 mark	t - Ible bond e bond thy -	[2]

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(c) <u>Reasons for reducing fat in the diet</u> high fat intake may cause obesity - caused by accumulation of fat classified as obese if more than 1/3 of body weight is fat by overeating /more calories than required - excess fat is stored under skin/as adipose tissue - and around internal organs usually less active - so calories not burnt off - more weight gain puts strain on the heart - coronary heart disease - strokes hypertension - poor blood circulation - when arteries are narrowed - more difficult for blood to flow - may damage artery walls - breathing difficulties low self-esteem - problems during surgery - arthritis additional weight on joints saturated fat - usually from animals - contains cholesterol deposited on artery walls - narrows /blocks leads to heart attack if coronary artery is blocked or stroke if blood vessel in brains is blocked diabetes mellitus - high level of blood glucose - not enough insulin produced by pancreas - glucose excreted in urine may cause damage to nervous system/ eyes/ kidneys/ feet etc. 12 points 2 points = 1 mark[6]

4 (a) <u>Structure of protein</u>

Primary Structure

protein chain is a sequence of amino-acids amino acids combine through their amino and carboxyl groups known as a peptide bond most basic / simplest protein structure two amino acids (condense to) form a dipeptide - water eliminated – condensation reaction polypeptides formed when many amino acids combine polypeptides are chains of hundreds or thousands of amino acids 22 amino acids in food Linked together in a variety of combinations to make many different protein

Secondary Structure

primary structure of protein is folded to form an alpha helix/spiral - and beta pleated sheet stability of structure depends on presence of hydrogen bonds

Allow diagrams – max 2 12 points covering both areas

2 points = 1 mark

[6]

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(b) Globular and fibrous proteins

Globular

are bonded or compact shaped molecules - round ball albumins - e.g. ovalbumin (egg white), lactalbumin, blood plasma soluble in water - and dilute salt solutions - coagulated by heat globulins - e.g. lactoglobulin (milk, egg white, muscle cells, blood plasma) insoluble in water - dissolve in dilute solutions of electrolytes coagulate on heating- correct ref. to tertiary and guaternary structure

Fibrous

fibrous molecules - many twisted in helices - can give elasticity or strength others in form of pleated sheets insoluble in water - and dilute solutions of salts *collagen* - inelastic - high tensile strength connective tissue - e.g. meat, fish converted to gelatine - by prolonged contact with boiling water gelatine soluble in water - more susceptible to enzymic digestion *elastin* - present in elastic tissues - e.g. artery walls (meat), skin, tendons unchanged by heat- correct ref. to tertiary structure

14 points to include named types of protein named examples of types identified

structure of globular and fibrous protein reference to solubility, coagulation etc. 2 points = 1 mark Diagrams – max 2

(c) Effects of heat, agitation and acids

Heat - denaturation begins at 40 °C coagulation - begins at approx. 60 °C setting - e.g. custards coating - e.g. fish binding - rissoles setting of gluten - e.g. bread - to hold risen structure of baked goods *Lactalbumin forms skin on milk*

Agitation - foam formation - unfolding of globular proteins to entangle air - causes partial coagulation of protein whisking of egg white - e.g. meringue whisking of egg and sugar to trap air - e.g. sponge cakes

Acid - inactivation of enzymes / denaturation - above optimum pH marinade meat in lemon juice / vinegar / wine - soften protein food preservation - e.g. pickled herring bacteria in milk ferment lactose into lactic acid - pH lowered - milk protein coagulates - forms a curd / curdles
Must discuss all 3 for full marks
16 points - at least 3 points from each area
2 points = 1 mark

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((d)	Deamina removal deamina in liver - leaves be deamina which is 8 points	<u>ttion</u> of nitrogen from amino acids / amino group tion occurs if protein intake is greater than need produces ammonia – converted to urea ody via kidneys - in urine - toxic - ted molecules are converted to pyruvic acid - oxidised to release energy - or stored as fat - 2 points = 1 mark		[4]
5	(a)	Factors a Availabi depends droughts foods gro or growir availabili different those in no trade staple fo cannot a wealthy of wealthier new pres canned <i>i</i> unknown increase depends more peo more dis proximity	affecting food choice lity of food on where people live - type of land - climate - hurr - how they affect the cultivation of particular foods - by on locally - land may not favour animal rearing - ng particular crops - ty of transport to bring foods grown elsewhere - foods grow / are available in different countries - developing countries may have little choice of food - with others - poor countries cannot afford to import for od - rice / maize etc fford agricultural developments therefore little variety - countries import food - e.g. bananas / coffee / oranges - countries have developed technologically - servation methods - ' dried etc ownership of home freezers - new s - e.g. AFD - creation of new foods e.g. TVP - s availability of convenience foods - more expensive on income - ople work outside the home in developed countries - posable income - foods in season - home-grown pro- t to local markets - storage facilities - left-over food to	icanes - bods - depends s etc toring methods - duce - b use - etc.	mainly on - previously
		Culture choose f each cult may be i e.g. rice wheat us vegetaria may not each cult e.g. cow way - Roman (Christma wedding	and religion oods liked by families - habits - conditioning - ture has its own eating patterns - and styles of cooking influenced by availability of low-prices, locally-grown for in China and India / potatoes in Britain - sed for pasta in Italy - and for bread in UK - an families - children must follow - same attitude tow be able to change until old enough to make own food of ture has its own foods - often based on religious belie sacred to Hindus - Jew and Muslims must have anim Catholics eat fish on Fridays - some dishes associated is cake - Turkey for Thanksgiving in USA - dishes as cake / birthday cake with candles	g - od - hoices - fs - hals slaughtered with festivals - sociated with oc	in a particular

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Advertising and packaging

choice can be affected by how foods are shown to consumers television / newspaper adverts - displays in stores - taste-testing some advertisements appeal to children - sweets / McDonald's children more easily persuaded than adults - sweets at till tempted by free gifts / money off coupons / special offers to introduce new foods - attracted by colours of packaging - endorsements - health claims - peer pressure advertising convinces people that they 'should' buy certain foods packaging gives information - what is in package - some may be poor readers - serving suggestions make food look appealing - may give nutritional information manufacturers consider their role as educators some people choose foods with the least packaging - environmental issues waste of resources - others find packaged foods easier to store boxes easy to stack - saves time - can be stored as soon as food is brought home protects food from damage - contamination - tampering Physiological and psychological attributes depends how hungry the individual is - time available -

appearance - flavour - aroma and texture of food likes and dislikes - importance for appreciation of food will repeat if experience is favourable - individual perceptions of food occasion - entertaining - creating an impression comfort food - relief from stress, boredom etc. – easy to eat too much in some circumstances - snack foods etc. -

Nutritional knowledge and skill

food choice may be affected by its nutritional value knowledge from school /home - may depend on level of education differs between countries - nutrition may not be taught to everyone in school publicity campaigns in media - to increase awareness - and knowledge need to know the functions - and dangers of food - sources of nutrients in order to choose wisely - well-publicised dangers of excess fat / sugar / salt danger of CHD / obesity / hypertension - greater in affluent countries cheaper sources of HBV protein are just as valuable in diet milk / cheese / eggs cheaper cuts of meat can be tenderised - complementary proteins used cereals / pulses / nuts in same meal - improve quality of HBV protein skill may depend on teaching in school - or at home vounger people may lack skill less time spent at home - paid work outside home more use of processed food - reduces preparation and cooking skills may avoid certain meat / fish / fruit etc. may buy convenience foods e.g. puff pastry or may be skilled at limited dishes - choose foods to make those lack variety - may cook as a pastime - cake decoration etc. learn how to choose accordingly - expect success - to avoid waste if dishes do not turn out well, will not repeat more costly to buy ready-made food - but know the result to expect to pay for reliability -- e.g. choux pastry etc.

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Cost depen poore staple may b e.g. s cost i or den e.g. n CREL pulse keep buy lo make nutriti judge poor pover those conve high s low in Half r	nds er pe e foo be a smol bis no emar milk DITI es / o chid ocal e rat ious e arr peo rty li e wit enie suga n NS marl	on money available to spend on food - need to budg eople must spend a higher proportion of income on fo ods cheap - filling - can be basis of meals - local r a status symbol for rich people - spend more than the ked salmon / caviar - ot related to nutritional value - may depend on suppl nd for the food - <i>cheaper foods can have high nutritir</i> / <i>cheese / eggs - can choose cheaper sources of Hi</i> <i>ED ELSEWHERE</i> cereals etc protein complementation - grow own p ckens for family consumption - use food in season - ily - reduce transport cost - foods in season are usu her than buy ready-made food - careful use of conve a diet may need not be expensive - reduce purchase nount required - to avoid waste - use left-over foods ple may receive government help - free school mea imits choice of food - th unlimited income may make poor choices - ence foods often contain a lot of fat - ar - high salt - risk of obesity - CHD - hypertensio SP - etc. ks for 1-2 sections. Must discuss all sections for full r	pet - pod - pecipes etc every can afford - y available - very alue - BV - DO NOT C produce - special offers - ually cheaper - enience foods - of junk food - s - ls /food aid	REDIT IF
Half r 30 po	nari	rs for 1-2 sections. Must discuss all sections for full f 2 points = 1 mark (credi	narks t same point only	once) [15]
(b) <u>Reco</u> RDI is stater The F It repu Can h can c defini Allow Espea or con RDI is Defini + 4 po 2 poir	omm s the mer RDI rese help com ition vs in vs in vs in vs in vs in vs in vs in titior oint titior	e estimated intake (RDI) e estimated intake of nutrients to achieve healthy livin to varies between individuals according to their age and ents an approximate amount of each nutrient required o individuals to assess whether the food eaten is ade pare the nutritional value of the food eaten with the more explicit dividuals to plan meals so that they do not exceed the ly important to avoid deficiency diseases - ming more energy-giving food than the body can use hy a guide - can see how diet could be improved to n of RDI s = 1 mark	ng. 1 whole mark I activity level. I each day. quate for their da e nutritional requ eir RDI - supply RDI s etc.	for this aily need. They irement. Make 1 mark [3]
(c) Impor allows may b need can c can b partic may b given so tha 14 po	rtan s ind be c to a comp earr cular be c be c n per at ca	<u>ce of nutritional information on packaging</u> dividuals to monitor intake of nutrients - compare wit on a special diet - diabetic - CHD - hypertension e avoid / have a reduced intake of fat / saturated fat / sa pare the nutritional value of different products and ma n that different foods and be used together to comp r nutrients to give an average intake - controlling calorie intake - can calculate the total value r 100g - for easy comparison between products - a alories consumed can be calculated etc.	th RDI tc. Ilt / sugar etc. Ike choices - bensate for high Ie of food eaten Ind per product -	/ low levels of

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(a) <u>Reasons</u> to provid to enhar to provid to bind in to add co to add n to reduc to add in to add m part of th 6 reason 12 points		sons for including sauces in meals rovide a contrasting flavour - cheese sauce with cauliflower etc. nhance the flavour - mint sauce with lamb etc. rovide a contrasting texture - parsley sauce with fish etc. ind ingredients together - fish cakes / potato croquettes etc. dd colour - jam sauce with steamed pudding etc. dd nutrients - custard etc. educe richness - orange sauce with duck / apple sauce with pork dd interest or variety - chocolate sauce with ice cream etc. dd moisture - apple pie and custard etc. of the dish - lasagne / macaroni cheese etc. asons + 6 examples points bints = 1 mark			
(b)	(i) <u>C</u> s w a a c n c t a e 1 2	<u>Selatinisation</u> uspension of starch in water - separates grains - when heated with water - water penetrates outer layers of starch granule - softens t 60°C to 80°C - to 5 x original size - mixture becomes tt 80°C - starch grains break up - granules dispersed of molecules begin to unfold - mixture thickens - forms a sol - water enclosed in mesh sooled - thickness depends on type of starch - emperature of liquid - and the effect of other ingredients e.g. sugar etc. e.g. boiled rice, roux sauce, arrowroot glaze, blancmange 0 points (to include at least one example) e points = 1 mark	- swells - s viscous - hroughout water work - forms a and proportion , custard etc.	- long chains gel - when used - and [5	
	(ii) <u>E</u> n c c c c c c c c c c c c c c c c c c	Emulsification inixture of oil and water - which does not separate - an be oil-in-water - e.g. milk, cream, mayonnaise, ice cream, gravy etc. in water-in-oil - e.g. butter, margarine, egg yolk etc wo liquids which do not normally mix - need an emulsify e.g. lecithin in egg yolk - has hydrophobic group - attra and hydrophilic group - attracted to water - il molecules are suspended in water - mall amounts of oil are added at first - e.g. in mayonna b ensure thorough emulsification - more oil causes thick e.g. creamed cake mixture - liquid egg added to creame lo not separate / curdle if added gradually - ecithin is emulsifying agent - may show in a diagram) 0 points (to include at least one example) e points = 1 mark	ing agent - cted to oil - se - tening - d fat and sugar		
				[5	

-	Mark Scheme	Syllabus	Paper
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(iii) <u>Coa</u> whe prim cros irrev lose mor caus mus occu e.g. milk salt crac enzy renr med e d	<u>gulation</u> n heated - protein molecules change structure - der ary structure unchanged - secondary structure altere s-linkages break - these maintain shape of molecule rersible - molecule unfolds - sequence of amino acid s elasticity - hardens / sets - properties of protein al e viscous - unfolded molecules bond with each other sing protein to harden - egg albumin coagulates at 60 cle fibres (in meat) shrink - easier to digest by digest urs more readily with addition of acid - vinegar in water when boiling eggs - protein coagulates with lactic acid when turning sour added to cooking water when boiling eggs - sets albuked - yme - rennin - coagulates milk - in young children net used commercially - to make junket - and in check chanical action / whisking - partially coagulates protein ecules unfold - form a network around air - stabilisin meringue, soufflé etc. —	hatured - ed - ds remains the siter - less solub - form clumps) °C - yolk at 70 ive enzymes - - forms a curd umen which leak - ese-making - n - g foam -	ame le - -)ºC - :s if shell is
e.g. skin	of coagulation include boiled egg, egg custard, egg to on boiled milk etc.	or coating,	

scrambled egg / baked egg custard are gels - protein shrinks if overcooked - squeezes out liquid which has been enclosed / syneresis occurs reverse of gelatinisation in a starch sauce - retrogradation starches which are rich in amylopectin are resistant to retrogradation water can slowly weep out of a pectin gel during storage could be due to the presence of too much acid 8 points 2 points = 1 mark [4]

Pa	ge 15	Mark Scheme	Syllabus	Paper
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7 (a)	Factors I growth o e.g.sourd bacteria unpaster uncheck cross-co tempera multiply keeping blown ca chemica seeds tra accumul fish from e.g. tuna drinking contamir foods wi e.g. m (rhubarb AVP 20 points	making food dangerous to consume f bacteria - given correct conditions for growth - body be of food /moisture /warmth /time /suitable pH - introduced from infected sources - Salmonella from eg- urised milk - linked to TB - ed food - BSE - poor conditions in slaughterhouses of ntamination - poor personal hygiene of food handlers ture not low enough to prevent bacterial growth - once every 20 minutes - food too long before use / 'use by' dates not observed ins - food has begun to decompose - ls stored near food - weed killer / insecticides - eated with insecticide eaten instead of planting - ation of metals in the body - e.g lead/ mercury/ cadmit waters polluted by industrial waste - poisoning by mercury in Japan - water poisoned by lead pipes - effluent form chemical hated olive oil in Spain - th naturally occurring harmful substances - ushrooms/deadly nightshade/green potatoes/raw /moulds may produce myotoxins -	temp (up to 40 o ggs and poultry etc. /ignorance d - um etc. – factories - kidney bean	C) bacteria in s/oxalic acio
(b)	(i) thay in co to pr coul less do r bloo do n if no but bact will s and) thaw frozen chicken before cooking in cool place - e.g. refrigerator - bottom shelf - to prevent liquid dripping onto other food /cross contamination - could thaw in microwave oven - quicker - less time for bacteria to grow - must melt all ice - do not defrost using heat - warmth encourages bacterial growth - wash - blood and internal organs - may contain bacteria - do not place near cooked food - cross contamination(credit once) - if not completely thawed oven heat will only melt ice in centre - but will not cook food - temperature will not be high enough - bacteria will not be killed - will spread to cooked food when removed from oven - and given time - causes food poisoning - e.g. Salmonella etc.		sh - remove
	(ii) <u>cool</u> mus prot e.g.	<u>x chicken thoroughly</u> t reach 70 °C - for 2 minutes - in thickest part / cent le to check temperature - bacteria destroyed - Salmonella etc.	tre - no pink juic	ces - use food
	(iii) <u>serv</u> if ke give bact may if ea so n warr raise 20 p 2 pc	<u>e immediately</u> pt warm - or stored in a warm kitchen - bacteria mult n correct conditions - food /warmth/ time - eria multiply every 20 minutes - food soon becomes of not be heated again to destroy bacteria - ten cold may cause food poisoning - no change in app ot thought to be unsafe to eat - can contaminate othe n food should not be put into refrigerator before cooling es temperature of refrigerator - encourages bacterial g oints covering all area <i>(do not credit same point in mo</i> ints = 1 mark	tiply - dangerous - pearance - r foods - g - growth etc. ore than one que	<i>stion part))</i> [10]

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(c) (i) Principles of deep freezing water turns to ice - below 0 °C - cell contents impure lowers freezing temperature - frozen by -10 °C micro-organisms dormant - water unavailable for bacterial growth some bacteria destroyed - enzyme action slowed down store at -18 °C - enzymes which attack fat are still active - blanching inactivates enzymes - reduces bacteria by 90% must be quick frozen - to ensure small ice crystals - at -25 °C food passes through zone of maximum ice crystal formation in shortest time possible - 30 minutes or less does not damage cell walls - large crystals rupture cell walls liquid is lost on thawing - drips out - flavour lost texture / appearance spoilt make sure temperature of freezer is at -25 °C before food is put in freeze small amounts at a time to avoid raising temperature inside freezer etc. (ii) Advice on use of freezer use air-tight packaging materials / waterproof / completely sealed to prevent evaporation of liquids - 'freezer burn' on meat etc. dries out surface - cannot be reversed - leave a head space for liquids expand on freezing - remove air - suck out with a straw etc. air circulation causes moisture loss - label - on dry surface /name / amount / date of freezing - use by date / storage time - refer to textbooks for recommended time - e.g.

polythene bags /wax cartons/ plastic tubs - separate layers with plastic film etc. - use in rotation -pack in useable amounts - keep freezer full for maximum efficiency -

food packed together maintains low temperature more efficiently -

defrost every 6mths / do not allow the ice to build up

10 points - at least 4 points from each area

2 points = 1 mark

Even balance on (c) (i) and (c) (ii) for full marks

[5]

Pag	je 17	Mark Scheme	Syllabus	Paper
		GCE A LEVEL – October/November 2013	9336	01
(-)		value of mills		
(a)		<u>value ol milk</u> rotoin casoin lactalbumin lactoglobulin all IAAs		
	πον - μ	rotein - casein, lacialburnin, laciogiobulin - ali IAAs	-	
	fot find	lepair - maintenance - enzymes - normones etc.		
		ested warmth concentrated source of operative to	forms coll m	ombrana
		resteu - warmin - concentrateu source of energy etc		emprane
	calcium	arowth of bones and teeth - clotting of blood -		
	norvo fur	- growin of bones and teeth - clotting of blood -		
nerve runction - muscle runction phosphorus - growth of bones and teeth - found in cells -				
	release of energy - DNA etc			
	vitamin A	- depends on season -		
	more in s	summer milk when cows are fed outside -		
	formation	of visual purple - perception of light - healthy skin	mucous membr	anes etc.
	vitamin D) - absorption of calcium		
	riboflavin	- release of energy from glucose -		
	forms pa	rt of enzyme system		
	nicotinic	acid - oxidation of glucose - release of energy -		
	forms pa	rt of enzyme system		
	thiamine	- oxidation of nutrients to release energy -		
	acts as c	o-enzyme in process		
	24 points			
	2 points	= 1 mark		[
	but need poor sou poor sou skin and little carb and mov high perc would ne	babies born with a 6 month supply - dietary supply - to prevent anaemia - fatigue etc. rce of vitamin D - absorption of calcium - bones and rce of vitamin A - anti-infection - mucous membranes ohydrate - only lactose - baby needs energy for gro ement centage of water - ed to consume large amount to gain sufficient nutrient	l teeth wth -	
	no NSP	- needed to encourage chewing -		
	developn	nent of digestive system etc. as child grows		
	marasmu	is - too little food for children under 1 year -		
	thin bodi	es - weak - eventually death		
	kwashior	kor - insufficient protein - lack of protein causes ana	iemia -	
	protein n	eeded for formation of blood -		
		growin - muscle wasting - enlarged liver -		
	$\frac{12}{2}$ points			
		- 1 mark		

Breast feeding Advantages nutrients in correct proportion - readily absorbed - free correct temperature - antibodies present in milk - immune system protect baby against disease - clean/safe/instant -

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cannot be prepared incorrectly - does not cause allergies bond between mother and child - possible link to increased intelligence

Disadvantages

mother's diet may affect child - child may have intolerances tiring for mother - no-one else can help unless milk expressed and stored do not know how much baby has taken - some feel uncomfortable may be intolerance in public places etc. - cracked nipples

Bottle feeding

Advantages

can monitor the amount of milk taken by baby - others can help allows other members of family to spend time with child can feed in public without embarrassment

Disadvantages

equipment needs to be sterilised - danger of bacteria being transferred cost of bottles, formula milk etc. - people may not read instructions carefully - may add too little powder / too much water /baby does not get correct amount of food - water may be contaminated -

if left-over milk kept until later bacteria may thrive - perfect conditions -

some mothers may be influenced by advertising of formula milk -

unnecessary cost to family etc.

14 points - at least 2 points from each area (ensure that same knowledge is not credited in both sections i.e. do not accept argument and converse as two points) 2 points = 1 mark [7]