

Question	Answer	Marks	Guidance
1 a	<p>Dr Grace:</p> <p>idea that doctors have to decide who gets one (1)</p> <p>Dr Henshaw:</p> <p>idea that (may have to take the organs when) relatives do not agree / relatives may think the donor forgot to opt out (1)</p>	2	<p>ignore ref to deciding if to continue treatment</p> <p>ignore references to the wishes of the donor allow idea that have to decide whether to abide by the relatives wishes</p>
b i	<p>any two from: (in the opt out system)</p> <p>people do not need to do anything to donate / ORA (1)</p> <p>idea that organs may be donated even though donors did not wish this (1)</p> <p>they may forget to opt out / did not know they had to opt out / did not have time to opt out (1)</p>	2	<p>ignore don't need a card to donate</p>
ii	<p>any two from:</p> <p>(supports it because) the 2 (much) higher numbers are in opt-out countries / Spain and Portugal have higher numbers (1)</p> <p>(however) one country with opt out/Poland the numbers are lower (1)</p> <p>(can not tell) as only data from six countries given (1)</p>	2	<p>allow mean/ average/total in the three countries with opt out is higher (may quote figures: 24 vs 14 for means / 72.1 vs 42.1 for totals) allow Spain and Portugal support the prediction</p> <p>allow Poland does not support the prediction</p>
	Total	6	

Question	Answer	Marks	Guidance
2 a	too many bacteria / the colonies join together (1)	1	
b	(no because) her soil has 300 000 bacteria (1) has less than the normal / less than 3 000 000 (1)	2	allow one mark for dish 6 being diluted 100 000 times and dish 7 being diluted 1 000 000 times allow 1 mark ecf for yes, her soil has 3 000 000 bacteria which is the same as normal
	Total	3	

Question	Answer	Marks	Guidance
3 a i	mosquitoes suck infected blood/blood from someone with malaria (1) pass plasmodium into (new) individual/human/host (1)	2	ignore bacteria or virus ignore reference to merely biting but allow feeding/drinking infected blood ignore references to vector unless qualified allow pathogen / protozoan / parasite for plasmodium ignore malaria is transferred allow mosquitos suck blood with plasmodium and pass on to another human (2)
ii	mosquitoes breed in water / (female) mosquito lays eggs in water (1) ora and spraying insecticide kills mosquito/larvae/eggs/offspring (1)	2	ignore insecticide kills plasmodium/pathogen ignore it stops the eggs being laid in the water ignore insects unqualified
b	heat stroke (1) dehydration (1)	2	ignore just 'stroke' allow hyperthermia allow insufficient water to remove toxins allow higher level answers e.g. damage to enzymes / stops enzymes working / denatures enzymes (1) allow preventing chemical reactions happening (1) ignore kills enzymes ignore burn or body becomes too hot or overheats ignore damage to any body part e.g. organ failure
Total		6	

Question	Answer	Marks	Guidance
4 a	<p>kill (other) microorganisms / stops microorganisms entering (1)</p> <p>prevent production of other products / spoilage (1)</p>	2	<p>ignore stop microbes reproducing allow prevent contamination allow kill bacteria/fungi allow so there are no microorganisms/bacteria/fungi ignore simply stop microorganisms/bacteria/fungi ignore kill germs/bugs/viruses</p> <p>allow might change the products / reduce alcohol production allow idea that microorganisms might be harmful allow (other microorganisms) compete for resources</p>
b	<p>[Level 3] Two comparisons and two explanations Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Two comparisons and one explanation Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] One comparison OR one explanation Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at D to A*</p> <p>Indicative scientific points may include</p> <p>comparisons:</p> <ul style="list-style-type: none"> • alcohol production is/starts/finishes quicker/earlier with added sugar • both produce 14% alcohol / the same final percentage/level of alcohol <p>explanations:</p> <ul style="list-style-type: none"> • added sugar means fermentation / anaerobic respiration happens more quickly OR sugar is a limiting factor • 14% alcohol / high percentage/level of alcohol kills yeast <p>Note: One comparison and two explanations = L3,5 marks One comparison and one explanation = L2,3 marks</p> <p>ignore just ‘alcohol made from sugar’</p> <p>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</p>
Total		8	

Question		Answer	Marks	Guidance
5	(a)	<p>total protein eaten = 51(g) (1)</p> <p>EAR = 36(g) (1)</p> <p>correct deduction ie no, she is eating more than enough protein / too much protein (1)</p>	3	<p>allow ecf i.e two marks if there is a correct deduction but an error in either the calculation of EAR or protein eaten</p> <p>allow one mark if there is a correct deduction but an error in both the calculation of EAR and protein eaten</p> <p>no mark for deduction without figures for both protein and EAR to back it up</p> <p>allow yes, she is getting more than enough</p> <p>no mark for just 'no' but allow if a comparison is implied, e.g no, she needs 36 but is getting 51 = 3 marks</p>
	(b)	<p>Sue is pregnant / breast feeding / has a more physical mode of life / more exercise / recovering from injury (1)</p> <p>(needs more protein) as she is providing nutrition/milk (for her offspring) / needs to increase/repair her muscle / repair tissues / protein for growth of baby (1)</p>	2	<p>ignore Sue has had a baby</p> <p>ignore references to disease</p> <p>ignore supports the baby</p>

Question		Answer	Marks	Guidance
	(c)	<p>recognition that needs an alternative supply of protein / needs protein supplements (1)</p> <p>an example of such a source e.g dairy products / milk / cheese / eggs / tofu / beans / pulses / nuts / lentils / QuornTM / avocado / broccoli / spinach / peas / asparagus / greens / (1)</p>	2	<p>allow recognition that meat is a good supply of protein</p> <p>allow fish</p> <p>ignore vegetables / fruit / plants / just 'meat substitute' / 'vegetarian meat'</p> <p>allow protein shakes / protein drinks / myco-protein (2)</p> <p>allow need alternative source of iron / vitamin B6 / vitamin B12 (1) and example of such a source (1)</p> <p>ignore reference to other vitamins and minerals</p>
			Total	7

Question		Answer	Marks	Guidance
6	(a)	6.0 – 2.1 (1) BUT 3.9 (litres) (2)	2	allow 6.0 -2.2 (1) or 3.8 (2) ignore 4 (litres)
	(b)	any two from: lining of airways becomes inflamed (1) fluid builds up (in lungs) (1) muscles around bronchioles contract (1) airways/bronchioles constricted/narrowed (1)	2	ignore symptoms of asthma e.g. wheezing / tight chest / difficulty breathing / less air in lungs allow lining of airways becomes swollen ignore lungs become inflamed allow mucus builds up allow muscles in bronchioles go into spasm ignore just ‘airways shrink’ but allow airways shrink and restrict air flow ignore airways close allow lung capacity reduced ignore references to bronchi / trachea / alveoli
Total			4	

Question	Answer	Marks	Guidance
7	<p>[Level 3] More than one possible criticism given and an explanation that a build up of cholesterol reduces the supply of oxygen / glucose to the heart (muscle). Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] One possible criticism given and a recognition that cholesterol reduces blood flow to the heart (muscle) / in coronary arteries. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] One possible criticism given or a recognition that there is a link between (saturated) fat in the diet and cholesterol/plaque/reduced blood flow to heart or recognition that cholesterol reduces blood flow to heart or recognition that cholesterol build-up means the heart has to work harder. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to A*</p> <p>Indicative scientific points:</p> <p>criticisms:</p> <ul style="list-style-type: none"> • only six / seven countries studied • all developed countries • only measured total fat in diet / did not measure saturated fat in diet / can not deduce effect of saturated fat • Keys has assumed all other factors other than fat in diet were the same / other factors (influencing heart disease) have not been controlled for eg levels of salt in diet <p>ignore not enough evidence ignore simply other factors can cause / are linked to heart disease</p> <p>explanations:</p> <ul style="list-style-type: none"> • there is a link between the amount of saturated fat eaten and the build up of cholesterol plaques. • narrowed coronary arteries reduce blood flow to heart muscle <p>max 3 marks if do not use term cholesterol ignore saturated fat causes heart disease (in question) ignore simply 'cholesterol restricts blood flow' ignore references to just high blood pressure</p>
	Total	6	

Question			Answer	Marks	Guidance
8	(a)	(i)	some drugs are more harmful / dangerous than others / it depends how harmful / dangerous they are (1) different penalties (for possession / use) / it affects the penalty / AW (1)	2	ignore some drugs are stronger / addictive ignore incorrect class, eg class C drugs are more harmful = 1 allow AW for penalty eg punishment / fine / prosecution
		(ii)	LSD (1)	1	allow any correct answer eg 'magic mushrooms' / PCP / ketamine / 'angel dust' ignore cannabis (and any alternative wordings eg weed) as in question. ignore cocaine / heroin / alcohol / ecstasy
		(iii)	the widening of blood vessels (1)	1	allow widening of arteries / capillaries ignore veins widen allow blood vessels dilate allow blood vessels open up / expand / get bigger ignore blood vessels get fatter / swell up / relax ignore more blood flows not vessels move closer to surface
	(b)		any two from: idea that no / less neurotransmitter / chemical to bind with next neurone / AW (1) prevents nerve impulses passing from neurone to neurone (1) at / across a synapse (1)	2	allow prevents nerve impulses being sent along / to next neurone ignore slows down impulses / reduces impulses / blocks impulses / impulses can not get through ignore references to messages / signals / information

Question		Answer	Marks	Guidance
	(c)	(i)	5000 (2) but 75000 in lethal dose box (1)	2 allow ecf for max 1 if therapeutic ratio = value for lethal dose $\div 15$ eg lethal dose = 750, TR = 50
		(ii)	any two from: heroin (no mark) because: smallest lethal dose (1) smallest therapeutic ratio (1) most likely to have an overdose as smallest dose needed to have an effect is closest to lethal dose (1)	2 no mark for heroin on its own, but need heroin to get mark(s) allow comparative answers, eg smaller lethal dose ignore non-comparative answers eg 'lethal dose is only 48mg' but allow eg 'lethal dose is only 48mg but lethal doses of others are 300,000 and 75,000' ignore most dangerous (in question) / most likely to kill you ignore smallest dose needed to have an effect
			Total	10