

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><b>ignore</b> ref to deciding if to continue treatment</p> <p><b>ignore</b> references to the wishes of the donor</p> <p><b>allow</b> idea that have to decide whether to abide by the relatives wishes</p>
b i	<p><b>any two from:</b> (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><b>ignore</b> don't need a card to donate</p>
ii	<p><b>any two from:</b></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><b>allow</b> 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)</p> <p><b>allow</b> Spain and Portugal support the prediction</p> <p><b>allow</b> Poland does not support the prediction</p>
	<b>Total</b>	<b>6</b>	

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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	<b>allow</b> one mark for dish 6 being diluted 100 000 times and dish 7 being diluted 1 000 000 times  <b>allow</b> 1 mark ecf for yes, her soil has 3 000 000 bacteria which is the same as normal
	<b>Total</b>	<b>3</b>	

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

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

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><b>allow ecf</b> i.e two marks if there is a correct deduction but an error in either the calculation of EAR <b>or</b> protein eaten</p> <p><b>allow</b> one mark if there is a correct deduction but an error in both the calculation of EAR <b>and</b> protein eaten</p> <p>no mark for deduction without figures for both protein and EAR to back it up</p> <p><b>allow</b> 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><b>ignore</b> Sue has had a baby</p> <p><b>ignore</b> references to disease</p> <p><b>ignore</b> supports the baby</p>

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

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

Question	Answer	Marks	Guidance
7	<p><b>[Level 3]</b> More than one possible criticism given <b>and</b> 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><b>[Level 2]</b> One possible criticism given <b>and</b> 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><b>[Level 1]</b> One possible criticism given <b>or</b> a recognition that there is a link between (saturated) fat in the diet and cholesterol/plaque/reduced blood flow to heart <b>or</b> recognition that cholesterol reduces blood flow to heart <b>or</b> 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><b>[Level 0]</b> Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p><b>This question is targeted at grades up to A*</b></p> <p><b>Indicative scientific points:</b></p> <p>criticisms:</p> <ul style="list-style-type: none"> <li>• only six / seven countries studied</li> <li>• all developed countries</li> <li>• only measured total fat in diet / did not measure saturated fat in diet / can not deduce effect of saturated fat</li> <li>• 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</li> </ul> <p><b>ignore</b> not enough evidence <b>ignore</b> simply other factors can cause / are linked to heart disease</p> <p>explanations:</p> <ul style="list-style-type: none"> <li>• there is a link between the amount of saturated fat eaten and the build up of cholesterol plaques.</li> <li>• narrowed coronary arteries reduce blood flow to heart muscle</li> </ul> <p><b>max 3 marks</b> if do not use term cholesterol <b>ignore</b> saturated fat causes heart disease (in question) <b>ignore</b> simply 'cholesterol restricts blood flow' <b>ignore</b> references to just high blood pressure</p>
	<b>Total</b>	<b>6</b>	

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	<b>ignore</b> some drugs are stronger / addictive <b>ignore</b> incorrect class, eg class C drugs are more harmful = 1  <b>allow</b> AW for penalty eg punishment / fine / prosecution
		(ii)	LSD (1)	1	<b>allow</b> any correct answer eg 'magic mushrooms' / PCP / ketamine / 'angel dust' <b>ignore</b> cannabis (and any alternative wordings eg weed) as in question. <b>ignore</b> cocaine / heroin / alcohol / ecstasy
		(iii)	the widening of blood vessels (1)	1	<b>allow</b> widening of arteries / capillaries <b>ignore</b> veins widen <b>allow</b> blood vessels dilate <b>allow</b> blood vessels open up / expand / get bigger <b>ignore</b> blood vessels get fatter / swell up / relax <b>ignore</b> more blood flows  <b>not</b> vessels move closer to surface
	(b)		<b>any two from:</b> 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	<b>allow</b> prevents nerve impulses being sent along / to next neurone <b>ignore</b> slows down impulses / reduces impulses / blocks impulses / impulses can not get through <b>ignore</b> references to messages / signals / information

Question		Answer	Marks	Guidance
	(c)	(i)	5000 (2) <b>but</b> 75000 in lethal dose box (1)	2 <b>allow</b> ecf for max 1 if therapeutic ratio = value for lethal dose $\div 15$ eg lethal dose = 750, TR = 50
		(ii)	<b>any two from:</b> 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)  <b>allow</b> comparative answers, eg smaller lethal dose <b>ignore</b> non-comparative answers eg 'lethal dose is only 48mg' <b>but allow</b> eg 'lethal dose is only 48mg but lethal doses of others are 300,000 and 75,000' <b>ignore</b> most dangerous (in question) / most likely to kill you  <b>ignore</b> smallest dose needed to have an effect
			<b>Total</b>	<b>10</b>