<sup>1</sup> (a)	glucose – R; oxygen – Q; urea – P;	[3]	
(b)	amino acids used to make proteins; deamination; removal of, nitrogen-containing group / amino group / amine group / AW; formation of urea; rest of molecule / carbohydrate, is, respired / stored as glycogen / converted to fat / used for energy;	[max 3]	R the liver produces amino acids
(c) (i)	(stimulates liver cells to) absorb more glucose; <b>A</b> sugar store / convert, glucose; to glycogen (for storage);	[max 2]	
(ii)	(stimulates liver cells to) breakdown glycogen; to glucose; release glucose;	[max 2]	A convert to / AW
(iii)	fatty liver / build up of fat deposits ; hepatitis ; fibrous tissue ; cirrhosis ; liver cancer ; liver failure ;	[max 2]	
(d) 1 2 3 4 5 6 7	bile contains bile salts;  emulsify (fats) / emulsification (of fats); break large globules of fat into smaller globules / AW; mechanical / physical, digestion; increases surface area; for digestion by lipase; (chemical) digestion of fat, takes longer / is harder;	[max 4]	
		[Total: 16]	

Question	E Answers	Marks	Additional Guidance
2 (a	organ(s)); (has been through) an organ / named organ (beforehand);		
	lost oxygen to, (named respiring) tissues / (named) organs / cells / AW;	2	
(b)	oesophagus ;		T
	stomach; gall bladder; duodenum; ileum; pancreas;		Accept small intestine as alternative to duodenum and ileum
	colon / large intestine / rectum ;	4	
(0)	A glucoso amino coido t		T
(c)	glucose, amino acids; (named) vitamin(s) / (named) mineral(s); in solution / soluble / in the plasma; transported from, small intestine / duodenum / ileum site of absorption; to liver;	max 3	
(d	to max 4 (when a) high glucose concentration, glucose converted to glycogen; low glucose concentration, glycogen converted to glucose; ref to correct role of, insulin / glucagon; makes plasma proteins; excess amino acids, deaminated / described;		
	to max 3 alcohol, broken down / respired / metabolised; named toxin, broken down; <b>R</b> toxin unqualified	max 5	

2	(e)		phagocytes to max 3		
		1	ingest / engulf , bacteria / pathogens / viruses ; R 'eat'		
		2	digest / destroy (bacteria / pathogens / viruses);		
		3	using enzymes;		
		4	any further detail;		
			lymphocytes to max 3		
		5	make / produce / secrete / release, antibodies;		
		6	idea of specificity / lymphocytes respond to		
			particular pathogen <i>or</i> antigen ;		
		7	effect of antibodies described;		
		8	AVP;		AVP for either cell type, could be additional point about
		O	Ανι ,	max 4	antibodies
				[Total: 18]	

Question	E Answers	Marks	Additional Guidance
3 (a)	A left atrium; B mitral / bicuspid / atrioventricular, valve; C semi-lunar valve / pocket valve / aortic valve; D right ventricle;	[4]	reject if correct and incorrect answers given for each A atria A auricle A 'oracle' / 'oricle' A if given the plural A if given the plural, A 'half-moon' valve
(b)	E (superior / anterior) vena cava ; F aorta ;	[2]	
(c)	coronary;  fatty deposit in (wall of) artery;  blocks, artery / restricts, blood flow; restricts, oxygen / nutrient, supply; blood clotting occurs;	[1] [max 2]	R cardiac A phonetic spellings ignore incorrect name for MP1–4 A atheroma / plaque A cholesterol / LDL / fatty acids A arteriosclerosis / described A 'narrows' artery R if 'to body' ignore high blood pressure
(d)	heart not pumping blood / keeps blood circulating; blood is oxygenated; carbon dioxide is removed from blood;	[max 2]	A blood not pumped to the lungs A exchange of oxygen and carbon dioxide for two marks ignore 'to keep patient alive' / 'supply heart with blood'
(e)	ref. to (cardiac) muscle; ref. to myogenic / heart has own pacemaker; septum (divides heart into two); two (separate) ventricles / AW; ventricle(s), contract / pump; increase blood pressure; right ventricle has thin(er) wall / left ventricle has thick(er) wall; so low(er) pressure / higher pressure; (in context) to lungs / to rest of body; (in context)	[max 4]	R 'push' A bigger, R tougher A muscle A 'to whole body' for LV if blood to lungs described
	   [T]	otal: 15]	