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BIOLOGY

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Paper 3 Theory (Core)

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MARK SCHEME

Maximum Mark: 80

Published

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This document consists of **12** printed pages.

Mark schemes abbreviations

- ; separates marking points
- / alternatives
- **I** **I**
- **R** reject
- **A** **A** (for answers correctly cued by the question, or guidance for examiners)
- AW alternative wording (where responses vary more than usual)
- AVP any valid point
- **ecf** credit a correct statement/calculation that follows a previous wrong response
- **ora** or reverse argument
- () the word/phrase in brackets is not required, but sets the context
- underline actual word given must be used by candidate (grammatical variants excepted)
- max indicates the maximum number of marks that can be given

Question	Answer	Marks	Guidance
1		5	1 mark for each correct line up to max 5 deduct a mark for each incorrect line when more than 5 are drawn A link between addiction and nicotine link between liver damage and heroin

Question	Answer	Marks	Guidance
2(a)	(A) petal ; (B) anther / stamen ; (C) stigma / filament ; (D) ovule ;	4	I style / carpel I ovum / ovary / seed

Question	Answer			Marks	Guidance
2(b)	structure	how a wind-pollinated flower differs from the flower in Fig. 2.1	reason for difference	6	AW throughout I scent / nectary
	anther	loosely attached	easily shaken by wind to release pollen		
	petals	small / absent / dull / inconspicuous / not colourful / green / not wide / not long ;	no need to attract pollinators / insects not required ;		
	stigma	large / feathery / long / protruding / exposed / hairy / wide / tall / thick ;	(large surface area) to, catch / trap / receive, pollen ;		
	pollen	smooth / light / small / more / not sticky ;	easily carried(by wind) / higher chance of pollination ;		

Question	Answer	Marks	Guidance
3	femidom ; vagina ; sperm ; surgical ; sperm duct ; chemical ;	6	

Question	Answer	Marks	Guidance
4(a)(i)	13 (days) ;	1	
4(a)(ii)	flower food prolongs the life of the flower / petals take longer to drop off if the plant has flower food / ora ;	1	A flowers in water for water only I growth
4(b)(i)	xylem ;	1	I vascular bundle / vein A tracheid
4(b)(ii)	source of energy / energy released ; by respiration ; AVP ; e.g. use of glucose to form other (named) molecules	2	A correct, word / symbol equation for respiration for max 1
4(b)(iii)	an organism that gets its energy ; from, dead / waste, (organic) material ;	2	

Question	Answer	Marks	Guidance
5(a)	(R) epidermis ; (S) palisade ; (T) guard cell / cytoplasm ; (V) stoma / stomata ;	4	
5(b)	1 photosynthesis ; 2 carbon dioxide and water (substrate) / AW ; 3 glucose and oxygen (produced) ; 4 <u>energy</u> needed comes from light / light <u>energy</u> converted to chemical energy ; 5 chlorophyll / chloroplasts, traps / absorb, the light (energy) ; 6 carbon dioxide from the air / water from the soil ;	4	A mp2 and mp3 in a correct, word / symbol equation A sun / sunlight mp5 must be stated (not inferred by being placed on an arrow in an equation) I from the roots

Question	Answer				Marks	Guidance
6(a)			name of insect	letter on Fig. 6.1	5	5 or 6 correct = 5 4 correct = 4 3 correct = 3 2 correct = 2 1 correct = 1
	1					
	2		<i>Melolontha</i>	J		
			<i>Cyriopalus</i>	E		
	3					
	4		<i>Trigonopterus</i>	F		
			<i>Ceutorhyncus</i>	K		
	5		<i>Stephanorrhina</i>	H		
			<i>Attagenus</i>	G		
6(b)(i)	jointed legs / exoskeleton / segmented body ;				1	
6(b)(ii)	<i>any two from:</i> crustacean ; myriapods ; arachnids / chelicerata ;				2	I centipedes / millipede I individual species names

Question	Answer	Marks	Guidance								
7(a)(i)	<table><tr><td>role in the food web</td><td>name of the organism</td></tr><tr><td>a producer</td><td>algae ;</td></tr><tr><td>a primary consumer</td><td>shrimp / mayfly (larvae) / blackfly (larvae) ;</td></tr><tr><td>an organism that is both a secondary and a tertiary consumer</td><td>trout ;</td></tr></table>	role in the food web	name of the organism	a producer	algae ;	a primary consumer	shrimp / mayfly (larvae) / blackfly (larvae) ;	an organism that is both a secondary and a tertiary consumer	trout ;	3	
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a primary consumer	shrimp / mayfly (larvae) / blackfly (larvae) ;										
an organism that is both a secondary and a tertiary consumer	trout ;										
7(a)(ii)	six ;	1									
7(a)(iii)	(the) Sun ;	1									
7(b)	<i>kingfisher:</i> numbers decrease ; lack of, food or energy / starvation / migration ; <i>shrimps:</i> number decrease ; (leeches will increase as not eaten by trout so) more leeches will eat (more) shrimp / more predators (of the shrimp);	4									
7(c)	arrow from caddisfly larva to duck (name in a box) ; arrow from aquatic plant (name in a box) to duck ;	2									

Question	Answer			Marks	Guidance															
8(a)(i)	liver ;			1																
8(a)(ii)	amino acids ;			1																
8(b)	<table border="1"><thead><tr><th>letter on Fig. 8.1</th><th>name of structure</th><th>function of structure</th></tr></thead><tbody><tr><td>L</td><td>renal artery</td><td>transports blood to the kidney</td></tr><tr><td>M</td><td><u>ureter</u>;</td><td>transports urine / urea, from kidney / to bladder ;</td></tr><tr><td>N</td><td>bladder ;</td><td>stores / keeps urine / urea ;</td></tr><tr><td>P</td><td>vena cava ;</td><td>transport blood to the heart / carries deoxygenated blood ;</td></tr></tbody></table>			letter on Fig. 8.1	name of structure	function of structure	L	renal artery	transports blood to the kidney	M	<u>ureter</u> ;	transports urine / urea, from kidney / to bladder ;	N	bladder ;	stores / keeps urine / urea ;	P	vena cava ;	transport blood to the heart / carries deoxygenated blood ;	6	
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8(c)	water ; salt(s) / (named mineral) ions ; AVP ;;			2	I glucose / proteins A mineral(s) e.g. hormones / vitamins / ammonia / creatinine															
8(d)(i)	lung(s) ;			1	A gills															
8(d)(ii)	blood / plasma ;			1	A red blood cell I blood vessels															

Question	Answer	Marks	Guidance
9(a)	impaired judgement / reduced self-control / reduced inhibitions ; increased / slower, reaction time ; depressant ; reduced coordination / blurred vision / double vision ; AVP ;	2	AW throughout I liver damage / high blood pressure e.g. drowsiness / dizziness / brain damage
9(b)	1 number of deaths (for, men / women) increases and decreases ; 2 male deaths increase until 2006 and decrease from 2008 ; 3 female deaths increase until 2008 then decrease / AW ; 4 reference to plateau (in men or women) / AW ; 5 both decrease from 2008 ; 6 number of male deaths (always) higher than number of female deaths / ora ;	3	
9(c)(i)	17 (per 100 000 population) ;	1	
9(c)(ii)	63 ;;	2	A $9 \cdot 7$ or $\frac{9 \cdot 700\,000}{100\,000} = 1\text{mark}$

Question	Answer	Marks	Guidance
9(c)(iii)	<i>decreases because:</i> 1 education / campaigns / people more aware (of dangers) ; 2 ref to economic reason / price of alcohol has increased ; 3 legislation / car drivers breathalysed and fined / alcohol banned in public places ; 4 social, awareness / pressures ; 5 AVP ; e.g. better health care / safer cars OR <i>increases because:</i> 1 addiction / people disregard their health ; 2 people unaware of dangers ; 3 more alcohol, available / affordable ; 4 more advertising (of alcoholic products) ; 5 peer / social, pressure ;	2	AW throughout

Question	Answer	Marks	Guidance
10(a)(i)	adrenaline ;	1	
10(a)(ii)	wide pupils ; increased, heart / pulse, rate ; increased breathing rate ; increased size of respiratory passages / AW ; increased level of glucose in blood ; AVP ;	2	e.g. increased blood pressure / increased alertness / redistribution of blood / reduced pain perception AW