Rewarding Learning

General Certificate of Secondary Education
2011

Science: Double Award (Non-Modular)

Paper 1
Foundation Tier

[G8401]

THURSDAY 19 MAY, AFTERNOON

MARK SCHEME

				AVAILABLE MARKS
1	**(a)**	trachea/windpipe	[1]	
	(b)	alveoli/air sac not lung	[1]	
	(c)	down	[1]	
	(d)	tar	[1]	4
2	**(a)**	Increase	[1]	
	(b)	Insulin	[1]	
	(c)	Hormone/protein (not amino acid)	[1]	
	(d)	Diabetes	[1]	4
3	**(a)**	1st mark some or all separated molecules; 2nd mark 5 as in diagram – correct shapes	[2]	
	(b)	diffusion	[1]	
	(c)	large surface area; villi; one cell thick; capillary network/ good blood supply	[2]	5
4	**(a)**	compost them/feed them to animals/green or brown bin/compost bin	[1]	
	(b)	not less pollution/cleaner environment unless qualified less fuel used transporting rubbish to landfill; less fuel used in manufacturing new materials; less artificial fertiliser manufactured; less raw materials being quaried less polluting gases/less CO_2/less global warming landfill sites not being filled so quickly less incineration; saves forests/resources/fossil fuels saves energy; (*any two*)	[2]	3

			AVAILABLE MARKS
5	**(i)**	decrease – more prey eaten/killed [2]	
	(ii)	<table><tr><th>Factor</th><th>Effect on population size</th></tr><tr><td>Immigration :</td><td>increase</td></tr><tr><td>Birth rate :</td><td>increase</td></tr><tr><td>Disease :</td><td>decrease</td></tr></table> [3]	5
6	**(a)**	uterus [1]	
	(b)	9 months [1]	
	(c)	glucose/amino acids/vitamins/named vitamins/minerals minerals [1]	
	(d)	Process of Birth (*any three*): (Uterus muscles) contract; Mucus plug comes away; Cervix dilates; head first Amnion ruptures/waters break [3] QWC 2 biological statements [2]	8
7	**(a)**	Plants in Pot A grow to one side [1]	
	(b)	Plants were grown where light is only available to the plant from one side for A [1]	
	(c)	Phototropism/tropism [1]	3
8		Benedict's – brick red/orange/red Biuret – lilac/purple/mauve [2]	2
9		More fibre – prevent bowel cancer/peristalsis; Less saturated fat – reduce risk of CHD/heart attack/lower cholesterol reduce stroke/less/reduce obesity less clogged arteries [2]	2
10		Photosynthesis; *transport* minerals; support; cooling; Solvent for chemical reactions/transpiration; [3]	3

			AVAILABLE MARKS
11	**(a)** radius and scapula	[2]	
	(b) biceps	[1]	
	(c) nerve/motor neuron/neuron	[1]	4
12	**(a)** ureter	[1]	
	(b) water/urea/salts (*any two*)	[2]	
	(c) kidney *transplant*	[1]	4
13	**(a)** **(i)** sugar/glucose; energy;	[2]	
	(ii) red blood cell/haemoglobin	[1]	
	(iii) diffuses into blood/plasma/tissue fluid	[1]	
	(b) **(i)** 1 mark each correct link body organs to right atrium vessel from right *ventricle* to lungs lungs to left atrium left *ventricle* to body organs	[4]	
	(ii) Aorta	[1]	
	(iii) needs to pump blood all around the body	[1]	
	(c) rises; drops; doesn't drop as low as starting point; quickly rises just after Booster (day 16)/steeper gradient rises to higher level;	[5]	
	(d) **(i)** all the same length *at start*	[1]	
	(ii) temp/amount of drying/volume of solution/same diameter cylinders/same type/age of potato	[1]	
	(iii) water moved out/left the cell; more water inside than outside the potato	[2]	
	(iv) plasmolysed cell 1 each correct label	[4]	23

AVAILABLE MARKS

14 (a) (i) edges – not shaded
centre – shaded [1]

(ii) centre has chlorophyll/chloroplasts;
(to trap light) for photosynthesis; [2]

(b) (i) sunlight/sun/light [1]

(ii) 2 and 3 2nd and 3rd [1]

(iii) marsh vegetation → grasshopper → herring → bald eagle
(1 correct food chain; 1 arrows) → but must have marsh veg. at start [2]

(iv) mosquito as top bar; salmon and seal [2]

(v) mosquito at top; mosquito smallest; symmetry + pyramid + steps; all labels correct rest (ignore top bar) in correct order and relative lengths correctly labelled = 1 [4]

(c) (i) Process A – photosynthesis
Process B – respiration
Process C – combustion (burning) [3]

(ii) wind; solar; hydro-electric; wave; tidal power; geothermal;
(*any two*) [2] 18

15 (a) (i) Cell A – sperm
Cell B – egg/ovum [2]

(ii) Cell A – testes
Cell B – ovary [2]

(iii) tail; for swimming/haploid chromosomes; to restore diploid no; [2]

(iv) fertilisation [1]

(b) (i) DNA/inheritance genetic; environment [2]

(ii) animals in population would be taller/average height taller [1]

(c) A – gene/allele;
B – chromosome;
C – nucleus/nuclear membrane; [3]

			AVAILABLE MARKS
(d)	**(i)**	skin [1]	
	(ii)	*Any two* cover up (e.g. wear hat); stay in the shade or out of the strongest sun (e.g. 11 am–3 pm); use a sunscreen liberally (high SPF); don't use sunbed or u.v. light; [2]	
(e)	**(i)**	Bb; × bb in this order [2]	
	(ii)	Punnett square; Correct cross; CM [2]	
	(iii)	Phenotypes: black (spots) brown (spots); Ratios: 1 : 1 ; [2]	22
		Total	**110**