

IGCSE Biology 4325 2H Mark Scheme (Results) Summer 2007

IGCSE

IGCSE Biology 4325 2H

BIOLOGY 4325, MAY 2007, MARK SCHEME

Key

- ; indicates separate mark points
/ indicates alternatives
eq allow for correct equivalent
— word underlined means no alternatives allowed

Paper 2H

1. (a) B; (3)
D;
C;
- (b) muscles; max
contract; (2)
peristalsis;
- (c) (i) cellulose; (1)
(ii) skin / gums / prevent scurvy / help connective tissue / (1)
protect against infection / help immune system;
Ignore keep healthy
- (d) (i) the faster the exercise the more energy needed /eq; (1)
(ii) 5 250; (1)

Total 9 marks

2.

Cell	Cell structure			
	nucleus	cytoplasm	cell wall	chloroplast
neurone (an animal cell)	✓	(✓)	✗	✗
<i>Pneumococcus</i> (a bacterial cell)	✗	✓	(✓)	(✗)
yeast (a fungal cell)	(✓)	✓	✓	✗

1 mark per pair of correct answers in each column.

Total 4 marks

3. (a) (i) gas used = oxygen (1)
gas produced = carbon dioxide;
- (ii) yeast in middle; (2)
arrows correct;
- (b) (i) 38; (1)
(ii) 50;;
38 - 57 / 19 / 57 - 38 for 1 mark (2)
- (c) optimum / best / ideal / better temperature / warmer / high;
enzymes / respiration / metabolism / reactions / eq; max
yeast reproduced; (2)
more food;
- (d) (i) XX and XY;
female and male;
gametes X and Y and all X / X and X;
offspring XX and XY; Allow ecf from parents
50:50 ratio given / eq; max
due to chance / random fertilisation / (5)
- (ii) fewer Y sperm / more X sperm / wrongly sexed /
miscounted / eq; (1)
Ignore gene
Ignore temperature

Total 14 marks

4. (a) reduce yield / eat crop / eat leaf;
less leaf / less surface area / trap light / absorb carbon dioxide;
less photosynthesis; (3)
- (b) kill/destroy pests / insects;
increase yield / reduce crop loss / prevent eating crop / eq; (2)
- (c) (i) 28; (1)
(ii) 48 / 48 thousand / 48 000; (1)
- (d) kills other insects / not specific;
affect consumer / disrupts food chains / persistent /
accumulation / not broken down / eq; max
reapplication needed / short lasting; (2)
resistant; Ignore immune
effect on humans / eq;
Ignore expensive
Ignore eutrophication

Total 9 marks

5. (a) (i) urea / water / salt / urine / mineral ion / named mineral ion; (1)
(ii) (less) oxygen transport; (1)
- (b) (i) white blood cells / lymphocytes / white / B / B cells / wbc; (1)
(ii) diaphragm / intercostal muscles;
no contraction;
no volume/pressure changes (in lung/chest);
no air/gas/oxygen in / no air/gas/ carbon dioxide out;
less oxygen to cells/blood/body;
less respiration / energy; (3)
Ignore suffocation / death (3)

Total 6 marks

6. (a) prevent photosynthesis;
produces oxygen; (2)
- (b) (i) A, C and D / all except B; (1)
(ii) 600; (1)
(iii) D; (1)
- (c) microbes / bacteria / decomposers increase;
less oxygen; (3)
(less) respiration (by organisms); (3)
death;
eutrophication;

Total 8 marks

7. tar;
coughing;
effect on cilia;
mucus build up;
bronchitis;
bacteria / microorganisms / infection;
lung cancer / carcinogen;
blockage to tubes / difficulty in breathing/ventilation;
emphysema;
reduced surface area / less/damage to alveoli / less gas exchange / less diffusion; (5)
max (5)

Total 5 marks

8. (a) (i) 1 mark for each correct arrow;;; (4)
(ii) arrow from any box to carbon in atmosphere; (1)
- (b) greenhouse gas;
greenhouse effect;
global warming /trap heat / temperature rise;
ice cap melting;
sea level rising /flooding; (5)
migration/death/loss of species / disruption of food chain; (5)
climate change / described climate change;

Total 10 marks

9. (a)
- | Feature | Flower A | Flower B |
|---------------------|---------------------------------|-------------------------|
| Position of stamens | inside flower / petal | outside flower / petal; |
| Position of stigma | inside flower / middle / centre | outside flower; |
| Size of petals | large | small; |
| Type of stigma | sticky / smooth / solid | feathery / spikey; |
- (4)
- (b) transfer of pollen;
from anther/stamen to stigma (by insect); (2)

Total 6 marks

10. (a) palisade; (1)
- (b) 420 to 460; Ignore blue
650 to 690; Ignore orange (2)
- (c) less photosynthesis;
reflects / does not absorb green light; (2)
- (d) temperature;
CO₂; (max)
light intensity; (2)

Total 7 marks

11. (a) (i) has atrium;
has ventricle; (max)
has valve; (2)
blood in via vein;
blood out via artery;
Ignore chambers
- (ii) atrium and ventricle similar size / atrium bigger;
thicker walled ventricle;
one valve;
two chambers / one atrium / one ventricle / human has 4; (max)
no septum / not left or right / eq; (2)
fewer vessels / eq;
- (b) blood passes through heart once;
heart to gas exchange organ to body / not to lung / to gill /
ref to double circulation / two pumps / one atrium and one (2)
ventricle / in humans blood to lungs and to body;
- (c) to prepare body for physical activity / "fight, flight, fright" /
stress;
adrenal glands;
heart beats faster; (3)

(d)

Substance	Origin	Destination
Oxygen	lungs / alveoli / air sacs;	(respiring cells)
Glucose	<u>small</u> intestine / ileum / villi;	(respiring cells)
Urea	(Liver)	kidney / renal tubule / nephron;
ADH	pituitary;	kidney / renal tubule / nephron / collecting duct;

(5)

Total 14 marks

12. (a) (i) G;
T;
A; (3)
- (ii) two (strands)+ coiled/interweaving/twisted/spiral / eq; (1)
- (b) (i) restriction / endonuclease; (1)
(ii) ligase; Reject lipase (1)
(iii) transgenic; (1)
- (c) (i) insulin / eq; (1)
(ii) can be made quickly / in large quantities/ exact substance; (1)
Reject cheap

Total 9 marks

13. explants;
agar / nutrient / growth;
nutrients / minerals / growth regulators / glucose / H₂O / vitamins;
nutrients / minerals / growth regulators / glucose / H₂O / vitamins;
compost / soil / eq;
temperature / carbon dioxide / light / humidity / water;
temperature / carbon dioxide / light / humidity / water;
clones;
identical;

Total 9 marks

14. (a) (i) X = cornea; (2)
Y = lens; (1)
(ii) brain / cerebral cortex / visual cortex / cerebrum; (1)
- (b) blurred / not clear / eq; (2)
as retina wrong distance / not focussing / out of place; (2)

Total 5 marks

15. change/damage/mistake to genetic material / eq;
passed on / inherited;
rare / random / eq;
alters characteristic / named example eg sickle cell/Down's
harmful / description of effect;
few beneficial / description of effect; **max**
increase/decrease of gene/allele/condition/numbers in population; **(5)**
natural selection / evolution / speciation / eq;

Total 5 marks

PAPER TOTAL 120 MARKS