



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme January 2003

GCE

Biology B

Unit BYB8

Section A

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Unit 8: Behaviour and Population

Question 1

- | | |
|---|---|
| (a) (i) (Smell/sight of) food; | 1 |
| (ii) Bell / flashing light / sound of footsteps; | 1 |
| (iii) Salivation; | 1 |
| (b) Meat is (mainly) protein / fat / has no starch;
saliva has no protease or lipase /only amylase; | 2 |
| (c) Operant based on trial & error or random behaviour (whereas
classical is association between natural and non-natural stimulus);
Operant based on reinforcement of behaviour by reward (whereas
in classical non-natural stimulus replaces natural stimulus); | 2 |
| Total | 7 |
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Question 2

- | | |
|---|-------|
| (a) (high concentration of) oestrogen inhibits FSH production;
follicles / oocytes do not develop (in ovary);
no ovulation / no egg to fertilise; | 3 |
| (b) Pheromone(s) (in sweat);
hormone from hypothalamus stimulates/passes to <u>pituitary</u> ;
<u>increased</u> FSH production by pituitary;
(FSH) stimulates oestrogen production by ovary; | 3 max |
| Total | 6 |
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Question 3

- | | |
|--|-------|
| (a) Diagram shows:
narrower base;
increase in numbers of older age groups/ straighter sides; | 2 |
| (b) (i) High fertility rate;
higher than replacement rate of 2.0;
not balanced by under-5 mortality;
ref. to life expectancy greater than reproductive life; | 2 max |
| (ii) Disease/AIDS - affecting people of reproductive age /
increasing child mortality;
shortage of resources/starvation - increasing as population rises;
improved standard of living / contraception, so fewer children born;
effects of war, reducing number of parents, or causing
starvation/shortage of resources;
(Allow 1 mark for 2 factors, without explanations) | 2 max |
| Total | 6 |
-

Question 4

- (a)(i) Lungs less elastic / less able to expand;
more connective tissue / thickening of alveolar walls;
reduced ability of diaphragm/intercostal muscles to contract;
inflammation caused by over-production of interleukin;
(*not: loss of alveolar walls*) 1 max
- (ii) Reduced surface area for diffusion of oxygen/gas exchange;
less oxygen carried in blood;
less oxygen supplied to muscles / more anaerobic respiration in muscles;
less energy/ lower rate of respiration for muscle contraction; 3 max
- (b) Aorta does not expand as heart beats / walls become stiff;
recoil does not smooth out pressure / more fluctuation in arteries;
increased (systolic) pressure due to vessels staying narrower; 2 max
- Total 6
-

Question 5

- (a) DNA strand has complementary bases/nucleotides;
joining of matching pairs, i.e. C to G / A to T;
hydrogen bonding; 3
- (b) Availability of treatment/cure if cancer detected;
reliability of detection -e.g. number of false positive/negatives;
cost effectiveness - related to (e.g.) frequency of cancer (*not just cost*);
ethical issue explained, e.g screening of whole population, or by patient choice;
(*not: safety, since urine is tested*) max 2
- Total 5
-

Question 6

- (a)(i) Acrosome; 1
- (ii) Digest zona pellucida / (granulosa) cells surrounding oocyte/egg;
break down hyaluronic acid;
allow sperm to penetrate oocyte membrane / fusion of sperm with oocyte; 2 max
- (b)(i) Removal of (protein) coating round sperm;
exposure of acrosome / change in membrane potential of sperm tip;
by enzymes produced by female/in uterus; 2 max
- (ii) 1.47×10^8 , or equivalent = 2 marks;
Allow 1 mark for correct working in principle ($70 \times 70\% \times 3$) 2
- (c) (Fructose) used as respiratory substrate / for respiration / in glycolysis;
by mitochondria;
production of ATP;
ATP /energy used for contraction/movement of sperm tail; 3 max
- Total 10
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Question 7

- (a) Has cell wall / capsule / no glycoprotein spikes;
Has organelles / ribosomes / plasmids;
may have flagellum; 2 max
- (b) In droplets;
expelled during cough / sneeze / breathing out;
carried in aerosol by air currents / breathed in by other person; 2 max
- (c) Mutation (of genes / genetic material);
change in nucleic acid base sequence;
change in amino acid sequence of (glyco)protein;
change in tertiary structure, or in shape of protein;
existing antibodies do not match / new ones have to be produced;
immunological memory ineffective / takes time to develop immunity;
most people not immune, so rapid spread/epidemic;
previous vaccines ineffective; 6 max
- Total 10
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