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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Education

Biology 6416

Specification B

BYB8/A Behaviour and Populations

Mark Scheme

2008 examination - June series

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Question 1

(a) (i) Damage to endothelium / lining of artery;
Cholesterol / LDLs / fats;
Enter artery wall / build up on artery wall;
Occurs if body has higher LDL:HDL ratio;
Plaque becomes fibrous / calcified; 2 max

(ii) Less metabolism of fats / fats not broken down;
Increases LDL / decreases HDL; 1 max

(iii) High cholesterol / high (saturated) fat in diet / obesity;
High salt in diet;
High blood pressure;
Genetic factors;
Smoking;
Diabetes;
Age / menopause in women;
(*Accept scar tissue in endothelium*) 2 max

(b) (Atheroma / blood clot) blocks artery;
Insufficient oxygen / blood to heart <u>muscle;</u> 2

Total 7

Question 2

(a)

	Combined pill
Frequency of use	Every day / 21 out of 28 days;
Effect on FSH secretion	Decreases / inhibits;
Effect on ovulation	Stops (<u>*Not decreases*</u>);

;3

(b) Embryo less likely to implant;
Rate of development of uterine endometrium decreases / Endometrium too thin or not vascular / embryo development and endometrium development do not correspond;
2

(c) (Splitting results in) genetically identical offspring or clones / conventional leads to variation;
Reason – e.g. reference to role of mitosis/meiosis or formed from one zygote; 2

Total 7

Question 3

(a) Bacteria airborne / bacteria present in small water droplets (in air); 1

(b) Description (1 mark)

Decreased percentage vaccination leads to increased cases of whooping cough;

+ Explanation (2 marks)

Fewer children immune / decreased ability to produce memory cells;
Lower antibody production;
Bacteria not destroyed, so disease develops;
More likely / higher probability of coming into contact with infected person; 3 max

(c) Herd immunity;
90 - 95% of population vaccinated;
Lower chance of (unvaccinated babies / babies under 3 months) coming in contact with bacteria / infected people;

OR

0 cases of whooping cough (in 2000) / 30,000 cases of whooping cough (in 1980);
No source of infection / greater chance of infection; 2 max

Total 6

Question 4

(a) (i) Habituation; 1

(ii) Less energy wasted / greater ability to respond to new stimuli / does not respond to harmless stimuli; 1

(b) Transmitter produces impulse / action potential (in motor neurone) or binding of transmitter (to post-synaptic membrane) causes change in charge (across membrane) / depolarisation;
Lower amount of transmitter stops threshold for nerve impulse or action potential being reached / EPSP not at threshold;
No impulse / action potential produced in motor neurone;
No transmitter released at neuromuscular junction;
So no contraction of (gill) muscle; 3 max

Total 5

Question 5

(a) (i) Higher proportion of (more) muscle / lower proportion of (less) fat; 1

(ii) (Tall people have) larger surface area to volume ratio;
So greater heat loss;
High BMR to maintain body temperature; 2 max

(iii) Thyroxine / growth hormone; 1

(b) Decreased / less oxygen uptake (into blood / body);
Thicker walls increased diffusion path / reduced diffusion gradient;
(Decreased elasticity causes) less air in lungs renewed / smaller ventilation, so reducing diffusion gradient;
(In muscles) reduces ability to contract / move / reduces (aerobic) respiration; 3 max

Total 7

Question 6

(a) Limited amount of food can be collected (in unit time) / animal can only consume so much food (per unit time);
More time defending territory;
Less time foraging; 2 max

(b) Increased muscular activity / named activity;
Increased respiration; 2

(c) (i) When energy loss = energy gain; 1

(ii) Maximum difference between energy gain and loss; 1

(d) Uninterrupted courtship / mating / raising of young or more successful breeding;
Predation / disease less likely; 2

Total 8

Question 7

(a) (Receptor) proteins different / specific shape;
Due to tertiary structure;
Complementary nature of two proteins;
Different proteins present in different species; 2 max

(b) (i) Acrosome / acrosome reaction;
Releases enzymes / named enzyme (hyaluronidase);
Digests outer layer of egg / zona pellucida;
Fusion of egg and sperm membranes; 3 max

(ii) Formation of fertilisation membrane / cortical reaction (or described) / destruction of ZP3 receptors; 1

(c) ATP formed directly from Krebs cycle;
Production of reduced NAD / FAD or hydrogen attached to NAD / FAD;
H^+ or electrons passed through series of coenzymes / carriers / redox reactions / electron transport chain;
Energy released in transfer / energy made available;
Used to combine ADP and phosphate (to form ATP); 4 max
(Allow H^+ moved across inner mitochondrial membrane and pass through stalked particles forming ATP)

Total 10