

GCE 2004

June Series



Mark Scheme

Biology B

BYB7/A

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BYB7/A**Question 1**

- (a) colorimeter / amount of light transmitted/absorbed; 1
- (b) (i) no or little cell division / increase in population;
enzyme / protein / RNA / ribosome synthesis occurring; 2
- (ii) lysis of cells; 1
- (c) 3200; 1
- Total 5
-

Question 2

- (a) (i) single source of infection / one incubation period / not
transmitted from one individual to another; 1
- (ii) transmitted from individual to individual / several
incubation periods; 1
- (b) (i) ORT / rehydration / water / fluid intake;
with salts / minerals; 2
- (ii) acetylcholine does not bind to receptors;
on postsynaptic membrane / motor end plate
membrane/sarcolemma;
depolarization/action potential does not occur;
intercostal/diaphragm muscles (do not contract); 3 max
- Total 7
-

Question 3

- (a) (i) principle of calculating percentage change;
6.25%;
(correct answer gains 2 marks) 2
- (ii) decrease in number of vaccinations / vaccination ineffective /
side effects of vaccination / resistance to antibiotics /
new strains / mutants; 1

- (b) cilia move mucus / bacteria / debris;
(build up of) mucus / irritants stimulates coughing /
coughing to remove mucus; 2
- Total 5
-

Question 4

- (a) agar / nutrient plate with casein;
inoculate with bacteria and incubate / at specified temperature;
'clear zone' produced; 3
- (b) secretion of enzyme / extracellular digestion;
hydrolysis;
of peptide bonds;
into amino acids; 3 max
- Total 6
-

Question 5

- (a) binary fission; 1
- (b) semi-conservative replication / both strands used as templates;
hydrogen bonds break;
nucleotides align / individual nucleotides;
A and T / G and C / complementary base pairing;
DNA polymerase joins nucleotides; 4 max
- (c) production costs / yield;
low toxicity to cells / no side effects;
effective in conditions of use;
reasonably stable; 2 max
- Total 7
-

Question 6

- (a) (i) envelope / RNA / capsid / reproduce inside cells;
(accept glycoproteins/protein spikes) 1
- (ii) RNA polymerase v. reverse transcriptase / different antigens /
HIV has two RNA strands / HIV has two capsids / HIV has
icosahedral capsid; 1

- (b) memory B / T cells do not recognise (new antigens);
 antibodies previously produced are not effective;
 shape not complementary to new antigen;
 takes time to produce effective antibodies; 2 max
- (c) (i) antigen in membrane presented to lymphocytes / produce
 cytokinins; 1
- (ii) mitochondria provide (more) ATP / energy;
 (more) RER / ribosomes synthesise proteins;
 (more) Golgi body secretes / modifies or packages proteins /
 produces glycoproteins;
 (B lymphocytes) produces antibodies; 4
- Total 9
-

Question 7

- (a) fast growth rates;
 grow on cheap waste products / simple nutritional requirements /
 qualified economic benefit / easier to control / provide conditions;
 generally less toxic products;
 can be genetically manipulated; 2 max
- (b) (i) source of energy;
 provides phosphate group; 2
- (ii) negative feedback / competitive inhibition / non-competitive
 inhibition;
increase in lysine inhibits enzyme, production decreased;
decrease in lysine, decreases inhibition –lysine formed; 2 max
- (c) (i) increased production (as metabolic pathway not inhibited); 1
- (ii) DNA altered;
 change in base sequence / deletion / substitution / addition of base;
 mRNA altered / tRNA altered;
 different amino acids / primary structure;
 different hydrogen / ionic bonding;
 different tertiary structure;
 different inhibitor site; 4 max
- Total 11
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