

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 <u>receptors</u> ; on postsynaptic <u>membrane</u> / motor end plate <u>membrane/sarcolemma</u> ; 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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