



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme

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GCE

Biology B

Unit BYB7

Section A

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Question 1

(a)	Inhaling (infected) droplets;	1
(b)	Produce/Synthesise <u>m</u> RNA; not transcription	1
(c)	Virus destroys cells/lyses/breakdown; In nasal passage; (neutral upper respiratory tract) Releasing excess mucus;	2 max
	Total	4

Question 2

(a)	<u>Lysozyme</u> in saliva destroys/lyses bacteria;	1
(b)	Small numbers of typhoid bacteria needed to show symptoms; Takes time to move out of gut; Or converse Large numbers have to be eaten before <i>Salmonella</i> infection starts; Confined to the gut;	2
(c)	Personal hygiene; Separate raw from cooked foods; (neutral reference to cooking)	2
	Total	5

Question 3

(a) (i)	Allow CO ₂ /gases to leave/prevent pressure build up;	1
(ii)	Microorganism produce heat by respiration; Ref to surface area : volume ratio;	2
(b)	Penicillin is a secondary (metabolite); Growth must not be in log phase/ must be in stationary phase;	2
	Total	5

Question 4

(a)	Test with Iodine solution; <u>Time</u> until Iodine solution remains yellow/does not go blue-black;	2
(b) (i)	Evidence from the table comparing enzyme in solution with immobilised enzyme; (For example, at 50 °C rate of immobilised enzyme is not affected, in solution reduced by 10%)	1
(ii)	Less kinetic energy/less vibration; (neutral prevent denaturing)	1
(c)	Enzyme may be used many times/extracted Because enzymes are expensive/scarce; OR Enzyme does not contaminate product; Enables purification process to be eliminated/easily separated;	2
(d)	Above 40 °C/at 50 °C rate decreases; Break hydrogen/named bonds; (not peptide) Change globular/tertiary shape of protein/enzyme; Change shape of active site; No enzyme substrate complex/substrate does not fit;	4 max
	Total	10

Question 5

(a) (i)	0-4 days (Longer lag phase) To synthesise different enzyme which is not present;	1
(ii)	8-12 days (Population smaller) Energy needed/used to breakdown maltose/ less energy available;	1
(b)	Counting accurately; Calculate number in 1 mm ³ ; Calculate number in original culture;	3
(c)	Only measures live microorganisms/not a total count;	1
	Total	6

Question 6

(a)	Protease/peptidase/hydrolase; (accept endo/exo, trypsin/pepsin)	1
(b)	Receptor molecule specific shape to peptide; Complementary/fit;	2
(c) (i)	Mitosis; Identical genetic material/DNA passed to daughter cells; (ignore reference to chromosomes) DNA/gene codes for protein; Antibody is a protein;	4
(ii)	To quickly recognise/destroy second invasion of antigen;	1
(d)	Antibodies; passed from mother in breast milk/across placenta;	2
	Total	10

Question 7

(a)	Identify/locate gene for antigen; Cut <u>DNA</u> using restriction enzyme; Ref to sticky ends; Add to vector/plasmid; Using ligase to join; Put into suitable/non-pathogenic microorganism; Grow microorganism in fermenter; Extract antigen from medium/antigen secreted;	6 max
(b)	Culture bacterial pathogen/produce lawn; Antibiotic (discs); Clear area around disc indicates effectiveness of antibiotic; Ref to relative sizes;	4
	Total	10
