

**Biology Unit 1
Science (Double Award) (Modular)
Mark Scheme**

Question Number	Answer	Mark
1	<ul style="list-style-type: none"> • hyphae (1) • chitin (1) • enzymes (1) • saprotrophic / saprophytic (1) 	4

Question Number	Answer	Mark
2(a)(i)	<p>The only correct answer is B</p> <p><i>A is not correct as it does not produce hydrochloric acid</i></p> <p><i>C is not correct as it does not produce hydrochloric acid</i></p> <p><i>D is not correct as it does not produce hydrochloric acid</i></p>	1

Question Number	Answer	Mark
2(a)(ii)	<p>The only correct answer is D</p> <p><i>A is not correct as it does not store faeces</i></p> <p><i>B is not correct as it does not store faeces</i></p> <p><i>C is not correct as it does not store faeces</i></p>	1

Question Number	Answer	Mark
2(a)(iii)	<p>The only correct answer is C</p> <p><i>A is not correct as it is not the small intestine</i></p> <p><i>B is not correct as it is not the small intestine</i></p> <p><i>D is not correct as it is not the small intestine</i></p>	1

Question Number	Answer	Mark
2(b)	<p>An explanation that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • neutralises acid / eq (1) • optimal pH for enzymes / lipase eq (1) • emulsifies lipid / eq (1) • breaks down (large droplets) into small droplets / eq (1) • increases surface area for enzyme action /eq (1) 	3

Question Number	Answer	Mark
3(a)(i)	<p>An answer that makes reference to two of the following:</p> <ul style="list-style-type: none"> • (require) nutrition / food / eq (1) • respire /eq (1) • excrete (waste) /eq (1) • respond to surroundings / sensitivity / eq (1) • move /eq (1) • control their internal conditions / homeostasis /eq (1) • reproduce /eq (1) • grow / develop /eq (1) 	2

Question Number	Answer	Mark
3(a)(ii)	<p>The only correct answer is D <i>Pneumococcus</i></p> <p><i>A is not the answer as Amoeba does not cause bacterial disease in humans</i></p> <p><i>B is not the answer as Lactobacillus bulgaricus does not cause bacterial disease in humans</i></p> <p><i>C is not the answer as Mucor does not cause bacterial disease in humans</i></p>	1

Question Number	Answer	Additional guidance	Mark
3(b)	<p>An answer that makes reference to three of the following:</p> <p>Virus</p> <ul style="list-style-type: none"> • smaller / eq (1) • protein coat (1) • no cell wall (1) • no cell membrane / eq (1) • no cytoplasm / organelles / ribosomes / no vacuole / eq (1) • no plasmids (1) • no flagella (1) 	<p>Mark first 3 answers allow converse</p> <p>ignore nucleus mitochondria Golgi</p> <p>ignore chloroplasts loop or circles of DNA</p>	3

Question Number	Answer	Additional guidance	Mark
4(a)(i)	<p>5.5 – 4.2</p> <p>$((5.5 - 4.2) / 5.5) \times 100 = 24\%$</p>	<p>Full marks for correct answer</p> <p>Accept 23.6%</p>	2

Question Number	Answer	Additional guidance	Mark
4(a)(ii)	<p>An explanation that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • median used as each age has wide / high range (1) • not (influenced by) affected by extreme values / less affected by anomalies / eq (1) • data is skewed / eq (1) 	<p>Allow converse for mean</p>	2

Question Number	Answer	Mark
4(a)(iii)	<p>An explanation that makes reference to two of the following:</p> <ul style="list-style-type: none"> • (increases) (up to 20 years) as body / size / mass / chest cavity / lungs / muscle increases / grows / develops / eq (1) • no / little change (from 20) no further growth / stop growing / eq (1) • (decreases) (from 25 years) as <u>diaphragm</u> / <u>intercostal</u> muscle weaker / lungs less elastic / less recoil / eq (1) 	2

Question Number	Answer	Additional guidance	Mark
4(a)(iv)	<p>An answer that makes reference to two of the following:</p> <ul style="list-style-type: none"> • smoking (1) • lung disease / infection / condition / asthma/ bronchitis / emphysema / eq (1) • fitness / how active you are / eq (1) • body size/ height / mass / genetics /eq (1) • sex /eq (1) • altitude at which you live / eq (1) • pregnancy (1) • pollution / eq(1) 	ignore illness / health	2

Question Number	Answer	Additional guidance	Mark
4(b)	<p>A description that makes reference to three of the following:</p> <ul style="list-style-type: none"> • count number of breaths per minute / number of breaths in stated time (at rest) / eq (1) • breathing rate count per minute / number of breaths in stated time <u>after / during exercise</u> /eq (1) • repeat / using more participants /use group/ eq (1) • control age / sex / fitness of subjects / amount / period of exercise / eq (1) 	<p>allow use spirometer at rest for mp 1 – use spirometer after exercise for mp 2</p> <p>allow running increasing distances or durations of exercise for mp 1 and mp 2</p> <p>if measure heart rate can score mp 3 and 4 only</p>	3

Question Number	Answer	Mark
5(a)(i)	<p>The only correct answer is B M is the cell wall.</p> <p><i>A is not the answer as M is not the cell membrane</i></p> <p><i>C is not the answer as M is not the nucleus</i></p> <p><i>D is not the answer as M is not the vacuole</i></p>	1

Question Number	Answer	Mark
5(a)(ii)	<p>The only correct answer is C N is the cytoplasm.</p> <p><i>A is not the answer as N is not the cell membrane</i></p> <p><i>B is not the answer as N is not the cell wall</i></p> <p><i>D is not the answer as N is not the vacuole</i></p>	1

Question Number	Answer	Mark
5(b)(i)	sodium chloride (solution) / salt solution / bathing solution / eq (1)	1

Question Number	Answer	Additional guidance	Mark
5(b)(ii)	<p>An explanation that makes reference to four of the following</p> <p>in distilled water</p> <ul style="list-style-type: none"> • water enters cell / eq(1) • by osmosis (1) • from dilute solution to more concentrated solution / from high(er) water potential to low(er) water potential / water / outside has a higher water potential / eq (1) • cytoplasm pushed against cell membrane/ cell wall / eq (1) • cell is turgid / (1) 	<p>allow converse for cell in salt solution</p> <p>water exits</p> <p>allow as salt soln / outside has lower water potential</p> <p>allow high conc of water to low conc of water</p> <p>cytoplasm /cell membrane shrinks away</p> <p>cell plasmolysed / flaccid</p>	4

Question Number	Answer	Additional guidance	Mark
5(c)	<p>A description that makes reference to four of the following:</p> <ul style="list-style-type: none"> (immerse) onion epidermis /rhubarb epidermis / named suitable plant tissues / leaf epidermis / eq (1) same volume of solutions / stated volume of solutions /eq (1) <u>at least two</u> different concentrations of salt solution / eq (1) leave cells for stated time / same time / eq (1) (observe / draw / photograph under) <u>microscope</u> / eq (1) 	<p>allow 'layer of onion' 'onion skin cells' 'rhubarb stem' <i>Cladophora</i> / / toadflax /eq</p> <p>not just leaf</p> <p>not just water and salt solution</p> <p>if describe potato discs expt can score mp 2 3 4 so 3 max</p>	4

Question Number	Answer	Additional guidance	Mark
6(a)	<p>An answer that makes reference to the following points:</p> <ul style="list-style-type: none"> S scales linear and at least half axis (1) A1 Axes 'correct way round' (1) L lines straight and joining each point (1) A2 labelled 'year' and 'percentage of students' (1) P points accurately plotted (1) K key or lines labelled for cigarettes and vaping (1) 	<p>bar chart lose L only</p> <p>Do not allow L if extrapolated</p> <p>Points plotted within one small square</p>	6

Question Number	Answer	Mark
6(b)	<p>A description that makes reference to two from the following points:</p> <ul style="list-style-type: none"> e-cigarette use increased (from 2011) up to 2015 then decreased / decreased in 2016 (1) smoking normal cigarettes decreases (from 2011 to 2016) (1) at start e-cigarettes lower than smoking / significantly low / at end e-cigarette use higher than smoking / significantly high (1) 	2

Question Number	Answer	Additional guidance	Mark
6(c)	<ul style="list-style-type: none"> $15.8 - 8 = 7.8$ $7.8 \div 100 \times 60\,000 = 4680$ (2) <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> $15.8 / 100 \times 60\,000 = 9480$ $8.0 / 100 \times 60\,000 = 4800$ $9480 - 4800 = 4680$ (2) 	<p>Allow 1 mark for 7.8 or 0.078</p> <p>Award full marks for correct numerical answer without working</p>	2

Question Number	Answer	Additional guidance	Mark
6(d)(i)	<p>An explanation that makes reference to four of the following points:</p> <ul style="list-style-type: none"> less tar (1) fewer carcinogens / less risk of cancer (1) less risk of emphysema / lung disease / damage to alveoli / chronic bronchitis / damage to cilia / eq (1) less carbon monoxide (1) less risk of heart disease / strokes (1) less risk of addiction / can control nicotine levels (1) 	Allow converse for normal cigarettes for all MPs	4

Question Number	Answer	Mark
6(d)(ii)	<p>An answer that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • non-smokers may start using e-cigarettes (1) • e-cigarettes may lead to taking up smoking (1) • e-cigarettes are addictive as they contain nicotine (1) • nicotine can increase risk of blood clots / increase blood pressure (1) • e-cigarettes may also be harmful / damage lungs / risks not yet known (1) 	2

Question Number	Answer	Additional Guidance	Mark
7	<p>An answer that makes reference to six of the following:</p> <ul style="list-style-type: none"> • C – (plant ivy in) shaded and unshaded area / different exposure to light / eq (1) • O – same species / type / age / starting size of leaf / same plant / eq (1) • R – repeat with multiple leaves / repeat / eq (1) • M1 – measure length / width / height / surface area / eq (of leaves) (1) • M2 – grow ivy for same stated time (1) • S1 - temperature / pests / humidity / plant density / carbon dioxide / weather / time of year / wind / eq (1) • S2 – same water / minerals / soil / nutrients / fertiliser / pH / eq (1) 	<p>Allow different light intensities / distances of lamp</p> <p>Allow groups</p> <p>Ignore size of leaves Allow measure size with a ruler / in mm / eq Allow volume</p> <p>Minimum time of one day</p>	6