

Paper 2 Foundation

Question number	Answer	Mark
1(a)	C	(1)

Question number	Answer	Mark
1(b)(i)	<ul style="list-style-type: none"> temperature of water (1) start each experiment with the same amount of carbon dioxide (1) start each experiment with the same amount of water (1) 	(3)

Question number	Answer	Mark
1(b)(ii)	Any one improvement from: <ul style="list-style-type: none"> use a heat shield (1) use a water bath (1) 	(1)

Question number	Answer	Additional guidance	Mark
1(c)(i)	<ul style="list-style-type: none"> $\frac{23+24+22}{3}$ (1) $69 \div 3 = 23$ (1) 	award full marks for correct numerical answer without working	(1)

Question number	Answer	Mark
1(c)(ii)	repeat the reading to get concordant results/calculate the mean without the anomalous result	(1)

Question number	Answer	Mark
1(c)(iii)	{as light intensity decreases/distance from the lamp increases} the rate of photosynthesis decreases	(1)

Question number	Answer	Mark
2(a)(i)	A	(1)

Question number	Answer	Mark
2(a)(ii)	an explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): <ul style="list-style-type: none"> emphysema will reduce the amount of oxygen carried into the bloodstream (1) because there is reduced alveoli, which are the gas exchange surface between the lungs and blood capillaries (1) 	(2)

Question number	Answer	Additional guidance	Mark
2(b)(i)	24 ÷ 8 (1) 3 : 1 (1)	award full marks for correct numerical answer without working	(2)

Question number	Answer	Mark
2(b)(ii)	maximise gas exchange/maximise oxygen uptake	(1)

Question number	Answer	Mark
2(b)(iii)	C	(1)

Question number	Answer	Additional guidance	Mark
3(a)(i)	An accurately drawn pyramid of biomass: <ul style="list-style-type: none"> pyramid shaped with all three stages shown (1) accurate dimensions for the diagram (1) 	6 small squares cod 2 large squares krill 10 large squares plankton	(2)

Question number	Answer	Mark
3(a)(ii)	Any two of the following points: <ul style="list-style-type: none"> not all the krill is eaten (1) parts of the krill cannot be digested (1) the krill has used some biomass to provide energy for movement/heat/respiration (1) 	(2)

Question number	Answer	Mark
3(b)(i)	An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): <ul style="list-style-type: none"> number of cod would decrease (1) due to {smaller amount/limited/no} food supply (1) 	(2)

Question number	Answer	Additional guidance	Mark
3(b)(ii)	Any one from: <ul style="list-style-type: none"> predation (1) competition (1) disease (1) pollution (1) 	accept other environmental factors	(1)

Question number	Answer	Mark
4(a)	An explanation that combines identification – understanding (1 mark) and reasoning/justification – understanding (1 mark): <ul style="list-style-type: none"> part A is the sweat (eccrine) gland which releases water on to the surface of the skin (1) where heat is removed by evaporation (of the water) (1) 	(2)

Question number	Answer	Mark
4(b)	C	(1)

Question number	Answer	Additional guidance	Mark
4(c)(i)	An answer that combines points of interpretation/evaluation to provide a logical description: <ul style="list-style-type: none"> the internal temperature of the fish increases as the external temperature increases (1) at a linear rate (1) 	Allow manipulation of figures from 2–34°C / correct reference to data	(2)

Question number	Answer	Mark
4(c)(ii)	An explanation that combines identification – knowledge (1 mark) and reasoning/justification – understanding (1 mark): <ul style="list-style-type: none"> otters need an optimum temperature of 37 °C as this is the optimum temperature for enzyme action (1) <p>Plus one point from:</p> <ul style="list-style-type: none"> because at lower temperatures enzymes work too slowly (1) because at higher temperatures enzymes are denatured (1) 	(2)

Question number	Answer	Mark
4(d)	An explanation that combines identification – understanding (1 mark) and reasoning/justification – understanding (2 marks): <ul style="list-style-type: none"> shivering stops the body temperature falling when external temperature drops (1) because increased muscle contraction (1) generates heat via respiration/friction (1) 	(3)

Question number	Answer	Mark
5(a)(i)	C	(1)

Question number	Answer	Mark
5(a)(ii)	D	(1)

Question number	Answer	Additional guidance	Mark
5(b)(i)	10 mins = 600 s (1) 12 ÷ 600 (1) 0.02 (mm ³ /s) (1)	award full marks for correct numerical answer without working maximum of 2 marks if conversion not completed	(3)

Question number	Answer	Mark
5(b)(ii)	An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): <ul style="list-style-type: none"> transpiration would be reduced (1) as less evaporation from the surface of the leaf (1) 	(2)

Question number	Answer	Mark
5(b)(iii)	Any two of the following points: <ul style="list-style-type: none"> humidity (1) air speed (1) light intensity (1) 	(2)

Question number	Answer	Mark
5(c)	An explanation that combines identification – understanding (1 mark) and reasoning/justification – understanding (1 mark): <ul style="list-style-type: none"> transpiration rate is increased (1) because water molecules have more energy/move faster (1) 	(2)

Question number	Answer	Mark
6(a)(i)	To obtain a representative sample of the field (1)	(1)

Question number	Answer	Mark
6(a)(ii)	An answer that combines the following points of understanding to provide a logical description: <ul style="list-style-type: none"> Oxygen moves from the air across the skin into the worm/bloodstream (1) Carbon dioxide move from inside the worm/bloodstream to the air (1) 	(2)

Question number	Answer	Mark
6(a)(iii)	B	(1)

Question number	Answer	Mark
6(b)(i)	$\frac{5+2+6+3+4+4}{6} = 4$ (1)	(1)

Question number	Answer	Mark
6(b)(ii)	An answer that combines the following points of understanding to provide a logical description: <ul style="list-style-type: none"> divide the field area by the quadrat size (1) multiply by the mean number of daisies (1) 	(2)

Question number	Answer	Mark
6(b)(iii)	An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): <ul style="list-style-type: none"> less daisy plants are likely to be growing in this area (1) because the trees would cause lower light levels for photosynthesis/lower mineral levels for growth/less water available for photosynthesis (1) 	(2)

Question number	Answer	Mark
6(b)(iv)	Any two of the following: Temperature (1) pH (1) pollutants (1) water (1)	(2)

Question number	Answer	Mark
7(a)(i)	B	(1)

Question number	Answer	Mark
7(a)(ii)	to pump blood around the body under higher pressure	(1)

Question number	Answer	Mark
7(a)(iii)	An answer that combines the following points of understanding to provide a logical description: <ul style="list-style-type: none"> • blood would flow backwards from the ventricle to the atrium/blood will leak through (1) • less (oxygenated) blood would be pumped to the body (1) 	(2)

Question number	Answer	Mark
7(b)	An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): <ul style="list-style-type: none"> • the blood vessel has thick walls/small lumen (1) • to carry oxygenated blood/to carry blood under higher pressure (1) 	(2)

Question number	Answer	Mark
7(c)	<ul style="list-style-type: none"> the fish heart has two chambers rather than four chambers (1) the fish heart only has one ventricle and one atrium rather than two ventricles and two atria (1) only deoxygenated blood flows through the fish heart (1) the fish heart shows a single circulatory system rather than a double circulatory system (1) 	(4)

Question number	Answer	Mark
8(a)(i)	<ul style="list-style-type: none"> person 2 had a slightly higher blood glucose level than person 1 after fasting (by up to 0.2 mmols/l) (1) 	(1)

Question number	Answer	Mark
8(a)(ii)	<ul style="list-style-type: none"> person 2 had a much higher blood glucose level than person 1 two hours after taking glucose (up by 2.6 mmols/l) (1) 	(1)

Question number	Answer	Mark
8(a)(iii)	Insulin (1)	(1)

Question number	Answer	Mark
8(b)(i)	<p>An answer that combines points of interpretation/evaluation to provide a logical description</p> <ul style="list-style-type: none"> levels remain low up until day 14 then rise (1) they continue to rise to day 23 and drop at day 24 (1) 	(2)

Question number	Answer	Mark
8(b)(ii)	<p>An explanation that combines identification – understanding (1 mark) and reasoning/justification – understanding (1 mark):</p> <ul style="list-style-type: none"> as ovulation occurs (1) the levels of progesterone released from the corpus luteum increases to maintain the lining of the uterus (1) 	(2)