PEARSON EDEXCEL A-LEVEL BIOLOGY B · 9BI0

BIOLOGY



MARK SCHEME

TOPIC 2: CELLS, VIRUSES AND REPRODUCTION OF LIVING THINGS

CORE PRACTICAL 2

SCORE	PERCENTAGE
/36	%

STEMUP

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(Total for question = 5 marks)

Mark Scheme

Q1.

Question Number	Answer	Additional Guidance	Mark
	• length of pollen tube measured from photo (1) • magnification calculated (1)	Length = 33 (mm) Accept 31 – 34 (mm) / 3.1 – 3.4 (cm) Magnification = photo size / actual size = 33 000 / 136 = 243 / 242.7 / 242.65x Accept values in the range 227.9 to 250.0 x Units lose mp2 Correct answer with no working gains 2 marks	**Grad (2)**

Q2.

Question Number	Answer	Mark
	A description that makes reference to three of the following: • pollen grains put in {water / sugar / sucrose / mineral ions / glycerol} solution (1) • use of a (microscope) slide / cavity slide / use a coverslip (1) • use low power lens first / use increasing magnification (1)	**(3)**

Q3.

Question Number	Answer	Additional Guidance	Mark
	9 / 90		**(1)**

Q4.

Question Number	Answer	Additional Guidance	Mark
	conversion of mm into µm conversion of µm into mm conversion of µm into cm (1) divide image size by actual size (1)	Correct answer gains full marks, with no working shown 27 mm = 27 000 µm / 20 ÷ 1000 = 0.02 mm / 20 ÷ 10 000 = 0.002 cm 27 000 ÷ 20 = (×) 1350 / 13.5 x 10^2 / 1.35 x 10^3	**(2)**

Q5.

Question Number	Answer	Additional Guidance	Mark
	A description that makes reference to three of the following: • locate specimen by using {low power / medium power} objective lens (1) • (focus) using {low power / medium power} objective lens before the high power objective lens (1) • only use fine focus with high power lens (1)		**(3)**

Q6.

Question Number	Answer	Additional Guidance	Mark
	• multiplication (1) • division (1)	3.142×0.2^2 / 3.142×0.04 = 0.126 / 0.1257 / 0.12568 $18 \div 0.126 = 143$ Allow one mark if answer is 142.857 / 143.198 / 143.220 Correct answer gains full marks, with no working shown	**(2)**

Q7.

Question Number	Answer	Additional Guidance	Mark
(i)	An answer that makes reference to one of the following: • stems are {stronger / less likely to break / better supported} (1) • more {mineral ion / water} transport (1)		(1)

Question Number	Answer	Additional Guidance	Mark
(ii)	A description that makes reference to three of the following: • cut thin sections (of the stem) (1) • from same height of stem in young and old plants (1) • {use a stain / named stain} to see xylem (1) • measure thickness of xylem tissue (1)	Accept cut a core (if rings are being measured) Measure thickness of {rings / xylem} 1 mark if potometer used in method	(3)

Q8.

Question Number	Answer	Additional Guidance	Mark
(i)	• calculate sum of d^2 and divide (1) • calculate square root (1)	Correct answer gains full marks, with no working shown 68.8 ÷ 4 = 17.2 square root of 17.2 = 4.1 / 4.147 / 4.15 One mark for 17.2 / 68.8	(2)

Question Number	Answer	Additional Guidance	Mark
(ii)	A description that makes reference to two of the following: • leaves at {same height / same age} on stem (1) • sample at same stated position of leaf (1) • same surface of leaf (1)	**DO NOT ACCEPT** same location / same part / same place **DO NOT ACCEPT** same area / same part / same place	(2)

Question Number	Answer	Additional Guidance	Mark
(iii)	An answer that makes reference to three of the following: • (reduced growth) because less carbon dioxide absorbed (1) • therefore less {GP / GALP / glucose / sucrose} (1) • less transpiration so less mineral ions (1) • therefore less named product (1)	**ACCEPT** converse **ACCEPT** cellulose / amino acids / protein / chlorophyll / DNA **DO NOT ACCEPT** starch	(3)

Q9.

Question Number	Answer	Additional Guidance	Mark
(i)	An explanation that makes reference to the following: • shows variation from the mean / shows range of results from mean / spread of data around the mean / shows reproducibility / shows repeatability (1) • therefore gives an indication of significant difference / overlap gives indication of significant difference (1)	**ACCEPT** average	(2)

Question Number	Answer	Additional Guidance	Mark
(ii)	• divide number germinating by total number (1) • use graph to determine time (1)	Example of calculation 4 ÷ 11 = 36.36 / 36 / 36.4 36.36 is 16 to 18 minutes **ACCEPT** one mark for 12 to 14 if 3 ÷ 11 seen in working	(2)

Q10.

Question Number	Acceptable Answer	Additional Guidance	Mark
	An answer that makes reference to the following: • a small volume of blood is spread into a very thin layer and viewed under a microscope (1) • blood is examined to look for the presence of the malarial parasite *Plasmodium* (1) • use of appropriate personal protective equipment when handling human blood samples (1)	Ignore references to sickled cells	**(3)**

Q11.

Question Number	Answer	Additional Guidance	Mark
(i)	An answer that makes reference to the following: • one cell drawn with correct shape / proportion (1) • clear lines used to represent correct shape of cell, withno shading of any feature (1)	Must be a drawing not a diagram	**(2)**
(ii)	An explanation that makes reference to three of thefollowing: • companion cells for ATP production (1) • because sieve tubes are for transport of organic molecules (1) • because energy is needed for transport (both up anddown the stem) (1) • sieve tubes have no organelles, so less barriers to transport (1)	Allow named organic molecule eg {sugar / sucrose} Allow energy needed for active transport(of sugars) Allow sieve tubes have {sieve plates / plasmodesmata} so less barriers to transport	**(3)**