Mark Scheme (Results)

Summer 2025

Pearson Edexcel International GCSE In Biology (4BI1) Paper 2BR

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Summer 2025
Question Paper Log Number P78765RA
Publications Code 4BI1_2BR_2506_MS

General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question Number	Answer	Mark
1(a)	An explanation that makes reference to two of the following • self- pollination within same plant / flower /cultivar/ tree / uses one parent / eq (1) • cross-pollination from different plant / flower/ cultivar / tree/ uses two parents / eq (1)	**2**

Question Number	Answer	Mark
1(b)	A description that makes reference to four of the following 1. germinates /eq (1) 2. pollen tube grows down style / goes down style / eq (1) 3. enters ovule (via micropyle) / eq (1) 4. male nucleus / gamete travels down pollen tube / eq (1) 5. fuses with ovum / fuses with female gamete / fertilises ovum / fertilises female gamete / eq (1) 6. ovule becomes seed /eq (1) 7. ovary becomes fruit / eq (1)	**4**

Question Number	Answer	Additional guidance	Mark
1(c)(i)	• carbon hydrogen oxygen / C H O (1)	Any order Extra elements scores 0	**1**

Question Number	Answer	Mark
1(c)(ii)	An answer that makes reference to two of the following • fruit eaten by animals / insects / birds / eq (1) • egested /lost in faeces / eq (1) • seeds dispersed / taken to new areas / eq (1)	**2**

Question Number	Answer	Mark
1(d)	An explanation that makes reference to two of the following • <u>pollen</u> from same plant / flower/ cultivar eq (1) • cannot germinate / no pollen tube growth / eq (1) • no fusion / fertilisation / eq (1)	**2**

Question Number	Answer	Mark
1(e)	A description that makes reference to the following • flowers are large / petals are large (so seen by insects) /eq (1) • flowers / petals are coloured (so seen by insects)/eq (1) • flowers are scented / have scented petals /eq (1) • have nectary /produce nectar / eq (1) • anthers within flower / stigma within flower so insect brushes pollen / transfers pollen to stigma / eq (1)	**3**

Question Number	Answer	Mark
1(f)	An answer that includes • wind pollinated / no insects to carry pollen long distance / eq (1)	**1**

Question Number	Answer	Additional guidance	Mark
1(g)	An explanation that makes reference to two of the following • triploid cells cannot divide by meiosis / cannot be divided by two / equally / eq (1) • cannot produce haploid (gametes) / produce one set / n chromosomes / eq (1) • fertilisation / fusion not possible / eq (1)	allow 'converse' for normal cultivars	**2**

Question Number	Answer	Mark
2(a)	• W = lens (1) • X = cornea (1) • Y = retina (1)	**3**

Question Number	Answer	Mark
2(b)	A description that makes reference to the following • circular muscles relax (1) • radial muscles contract (1) • pupil dilates / gets wider /eq (1)	**3**

Question Number	Answer	Mark
3(a)	**D (weight potometer)** A is not the answer as it is not a bubble potometer B is not the answer as it is not a hydrometer C is not the answer as it is not an osmometer	**1**

Question Number	Answer	Additional guidance	Mark
3(b)	Calculation steps not marking points (207.25- 204.5) ÷48 = 0.05729 = 0.057 (2)	Allow **one mark** for 0.0573 or 0.05729 etc or 0.06 or 0.1 Not incorrect rounding so 0.572 no credit 5.7×10^{-2} scores 2 marks	**2**

Question Number	Answer	Additional guidance	Mark
3(c)	An explanation that makes reference to two of the following • can calculate mean /average / eq (1) • increases reliability / eq (1) • allows detection / exclusion of anomalous results / ensure results are concordant/ eq (1) • change in conditions could affect water loss/ results / eq (1)	Ignore accuracy / validity	**2**

Question Number	Answer	Mark
3(d)(i)	A description that makes reference to the following • use fan / hairdryer / eq (1) • control other / named environmental condition / temp / light /eq (1)	**2**

Question Number	Answer	Mark
3(d)(ii)	An explanation that makes reference to three of the following • moves moist air / water molecules away from leaf (surface) / stomata / reduces humidity / eq (1) • increases / restores (concentration) gradient / eq (1) • increases transpiration / evaporation / diffusion / eq (1) • more mass lost / mass changes more / eq (1)	**3**

Question Number	Answer	Mark
3(e)	A description that makes reference to two of the following • have two plants of same species / same type / same size / same leaf area / use same plant / eq (1) • remove roots / eq (1) • control named environmental condition / temperature / light / moving air / eq (1)	**2**

Question Number	Answer	Additional guidance	Mark
4(a)	An explanation that makes reference to two of the following • (number / amount / how many/ range) the different species / eq (1) • number / abundance / how many of each species / eq (1) • variation / variety (of organisms) (in an ecosystem) / eq (1)	species richness species evenness	**2**

Question Number	Answer	Additional guidance	Mark
4(b)(i)	A description that makes reference to the following • place at random / eq (1) • (place quadrats at) co-ordinates / eq (1)	Use random coordinates = 2 marks	**2**

Question Number	Answer	Additional guidance	Mark
4(b)(ii)	Calculation steps not mark points common sorrel 20 + 5 + 10 = 35 35 ÷ (5 × 0.25) 35÷1.25 = 28 per m^2 (3)	Allow one mark for 'species mark' for common sorrel or (20 + 5 +10) or 35 or 1025 Allow one for area mark ÷ (5 × 0.25) or ÷1.25 Or ÷0.25 or x 1/0.25 or x 4 Or allow 2 marks for 47 or 46.67 as this has selected correct species and used area Or allow 2 marks for 140 as this has	**3**

		selected correct species and used area Allow 3 marks for 28 per m^2	

Question Number	Answer	Mark
4(b)(iii)	meadow buttercup (1)	**1**

Question Number	Answer	additional guidance	Mark
4(b)(iv)	An answer description that makes reference to five of the following 1. more species present / eq (1) 2. more even distribution / similar numbers of each / eq (1) 3. common sorrel / stinging nettles absent/ eq (1) 4. more biodiversity / grazing increases biodiversity /eq (1) 5. reliable / repeated / more than one quadrat done in each field / eq (1) 6. no information on water / sunlight / temperature / fertilisers / minerals / seasons / eq (1) 7. only done on one field /repeat in other fields / eq (1) 8. no information about amount of animals / age of animals / duration /eq (1) 9. grazing reduces competition allows different species to grow / prevents succession /eq (1) 10. grazing provides increased nitrates/ minerals / manure /eq (1)	allow converse for B /ungrazed more variation between quadrats	**5 E**

Question Number	Answer	Additional guidance	Mark
5(a)	Calculation steps not mark points Full marks for correct answer (317÷3374) ×100 = 9.40(2)	If answer incorrect allow one mark for ÷3374 Or 9.39 =1 mark rounding error Allow 2 marks for 9.395 9.3954 etc	**2**

Question Number	Answer	Mark
5(b)	A description that makes reference to four of the following points: • use enucleated egg / empty egg / remove nucleus from egg / eq (1) • nucleus from body cell / diploid nucleus placed into empty egg / eq (1) • use of electricity / shock (1) • cell division / mitosis (1) • embryo into uterus / womb (1) • surrogate mother (1)	**4**

Question Number	Answer	Mark
5(c)	An explanation that makes reference to two of the following points: • fewer white blood cells / phagocytes / lymphocytes / memory cells / eq (1) • fewer antibodies produced / antibodies produced slower / less phagocytosis / less engulfing / eq (1) • less resistance / more susceptible to infection / disease / pathogen not killed / pathogen remains / eq (1)	**2**

Question Number	Answer	additional guidance	Mark
5(d)	An answer description that makes reference to four of the following 1. small study few cows involved /eq (1) 2. not repeated / not reliable / no information on strain / breed /type only females / only cows / eq (1) 3. higher birth mass in clones /eq (1) 4. older at puberty in clones / puberty later in clones / eq (1) 5. higher mass at puberty in clones /eq (1) 6. small difference / slight difference in growth rate / no significant difference in growth rate / slightly lower daily mass increase / eq (1) 7. no reference to diet / hormones / supplements / eq (1)	Allow converse for controls Not just higher mass Lower birth mass in controls younger / sooner lower mass at puberty slightly faster growth	**4**

Question Number	Answer	Mark
6(a)(i)	**D (proximal convoluted tubule)** **A** is not correct as U is not the Bowman's capsule **B** is not correct as U is not the collecting duct **C** is not correct as U is not the loop of Henle	**1**

Question Number	Answer	Mark
6(a)(ii)	**D (ultrafiltration)** **A** is not correct as it is not ADH production **B** is not correct as it is not selective reabsorption **C** is not correct as it is not transpiration	**1**

Question Number	Answer	Mark
6(a)(iii)	**B (Q)** **A** is not correct as P is the distal convoluted tubule **C** is not correct as S is the glomerulus **D** is not correct as T is the Bowman's capsule	**1**

Question Number	Answer	Additional guidance	Mark
6(b)(i)	Calculation steps not mark points Full marks for correct answer 0.1x 5 x 1000/100 = 5 (2)	Allow one mark for × 10 or x (1000/100) or ×5 or 5 in answer eg 0.05 0.5 etc	**2**

Question Number	Answer	Mark
6(b)(ii)	An explanation that makes reference to two of the following • protein molecules too large / large mass / too heavy / eq (1) • cannot pass out of glomerulus / into Bowman's capsule / into nephron / into tubules / through basement membrane / eq (1) • so stay in blood / not in filtrate / eq (1)	**2**

Question Number	Answer	Mark
6(b)(iii)	An explanation that makes reference to two of the following • glucose passes out of glomerulus / into Bowman's capsule / into nephron / into tubules / through basement membrane / eq (1) • (then) reabsorbed / back into blood / eq (1) • by active transport / eq/ (1) • in proximal convoluted tubule / PCT/ eq (1)	**3**

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