Pearson Edexcel

Mark Scheme (Results)

Summer 2025

Pearson Edexcel International GCSE In Biology (4BI1) Paper 1BR

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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)(i)	**A (*Mucor* is a eukaryotic organism with cell walls made of chitin)** *B is incorrect Mucor does not have cellulose* *C is incorrect as Mucor is not a prokaryote* *D is incorrect as Mucor is not a prokaryote*	**1**

Question Number	Answer	Mark
1(a)(ii)	**B (1)** *A is incorrect Mucor has cytoplasm* *C is incorrect as Mucor does not have chloroplasts or starch* *D is incorrect as Mucor does not have chloroplasts or starch*	**1**

Question Number	Answer	Additional guidance	Mark
1(a)(iii)	• $3.14 \times 45^2 = 6358.5$ • to two sig figs = 6400 **(2)**	**One mark** for answer between 6358 and 6362 that is not to two sig figs **Correct answer gains both marks**	**2**

Question Number	Answer	Additional guidance	Mark
1(b)(i)	An answer that makes reference to two of the following: • asexual produces <u>genetically</u> identical offspring / clones (1) • asexual has no fertilisation / no gametes / eq (1) • asexual only has one parent <u>cell</u> (1) • asexual uses (only) mitosis / asexual does **not** use meiosis / asexual does not use haploid cells (1)	**Accept** converse for all mark points **Accept** asexual results in same genes / alleles / DNA **Accept** asexual does not produce a zygote **Ignore** one parent alone / no need for mate	**2**

Question Number	Answer	Additional guidance	Mark
1(b)(ii)	An explanation that makes reference to the following: • sexual reproduction produces (genetic) variation / eq (1) • some may survive environmental changes / not all killed by disease / are more adaptable / natural selection can occur / survive change in climate / eq (1)	**Accept** converse for all points **Ignore** mutation **Accept** allow survival of fittest idea **Accept** idea of survival advantage **Accept** more disease resistant **Ignore** immune	**2**

(Total for Question 1 = 8 mark)

Question Number	Answer	Additional guidance	Mark
2(a)(i)	**B (bronchiole)** *A is incorrect as it is not an alveolus* *C is incorrect as it is not a bronchus* *D is incorrect as it is not a trachea*		**1**

Question Number	Answer	Mark
2(a)(ii)	An answer that makes reference to the following: • it has more than one tissue / is a group of tissues / is a collection of tissues / made of multiple tissues / eq (1)	**1**

Question Number	Answer	Additional guidance	Mark
2(a)(iii)	An explanation that makes reference to the following: • diaphragm moves down / flattens / eq (1) • (chest / thorax) volume increases (1) • (chest / thorax) pressure decreases / air flows from high pressure to low pressure / down a pressure gradient / eq (1)	**Ignore** contracts as in q stem **Ignore** refs to ribs / other muscles / lungs	**3**

Question Number	Answer	Additional guidance	Mark
2(b)(i)	• 35 x 70 x 30 = 73 500 (cm^3) **(2)** **One mark** for x 35 **or** x 70 or x 30 **or** 2450 **or** 1050 **or** 2100	**Accept** 74 000 **or** 73 000 for **two marks** **Correct answer gains both marks**	**2**

Question Number	Answer	Additional guidance	Mark
2(b)(ii)	An explanation that makes reference to three of the following: 1. oxygen use lower in smokers / lower rate of oxygen use / eq (1) 2. tar (in cigarettes) (1) 3. causes emphysema / mucus builds up / mucus not removed / cilia damaged / eq (1) 4. less <u>surface area</u> (of alveoli) / eq (1) 5. less <u>diffusion</u> of oxygen (into blood) (1) 6. carbon monoxide binds to haemoglobin (reducing oxygen) /eq (1) 7. causes narrowing of arteries / blocks blood vessels (reducing flow of oxygenated blood) / eq (1)	**Accept** less oxygen uptake / eq **Accept** converse **Accept** alveoli walls break down / deform / are damaged **Ignore** gas exchange **Ignore** veins	**3**

(Total for Question 2 = 10 marks)

Question Number	Answer	Mark
3(a)(i)	**D (ribosome)** *A is incorrect as cell membrane does not synthesise protein* *B is incorrect as mitochondrion does not synthesise protein* *C is incorrect as the nucleus does not synthesise protein*	**1**

Question Number	Answer	Mark
3(a)(ii)	**C (mitochondrion, nucleus and ribosome)** *A is incorrect as ribosomes are also present in both* *B is incorrect as nuclei are also present in both* *D is incorrect as mitochondrion is also present in both*	**1**

Question Number	Answer	Additional guidance	Mark
3(b)(i)	An explanation that makes reference to three of the following: **40 (: 1) (3)** 62.5 for **two marks** **OR** 400(:1) for **two marks** **OR** 4(:1) for **two marks** ÷1.2 for **one mark** **OR** ÷12 for **one mark** **OR** ÷0.12 for **one mark** **OR** 6.25 for **one mark**	Example calculation: 75 / 1.2 = 62.5 2400 / 62.5 = 40 **Correct answer gains all three marks**	**3**

Question Number	Answer	Additional guidance	Mark
3(b)(ii)	An answer that makes reference to four of the following: 1. villus has high(est) number of mitochondria (per cell) / sperm has low(est) number of mitochondria (per cell) / eq (1) 2. sperm has high(est) number of mitochondria per 10 μm^3/ skin has low(est) number 10 μm^3/ eq (1) 3. mitochondria perform (aerobic) respiration / make ATP / release energy / eq (1) 4. villus (cells) do active transport (so need lot of energy) / eq (1) 5. sperm cells move / swim (so need lot of energy) / eq (1) 6. skin cells have few active processes / use little energy / eq (1)	**Accept** villus has many mitochondria (per cell) **Accept** sperm have few mitochondria (per cell) **Accept** sperm has many mitochondria per 10 μm^3/ skin has few mitochondria per 10 μm^3/ eq (1) **Accept** volume or μm^3 for 10 μm^3 **Accep**t sperm has highest concentration / density of mitochondria / skin has lowest concentration / density of mitochondria **Ignore** produce energy	**4**

(Total for Question 3= 9 marks)

Question Number	Answer	Additional guidance	Mark
4(a)(i)	• water / protein (1)	**Accept** amino acids	**1**

Question Number	Answer	Additional guidance	Mark
4(a)(ii)	26 **(2)** **One mark** for correct answer to any number of decimal places e.g. 26.28571… **OR** **One mark** for 9.2÷35 **OR** **One mark** for 0.26(28571)	Example calculation: 9.2/35 x 100 = 26.28571 **Correct answer gains both marks**	**2**

Question Number	Answer	Additional guidance	Mark
4(a)(iii)	An answer that makes reference to one of the following: • helps peristalsis / eq (1) • prevents constipation / eq (1) • helps intestines push food / eq (1) • helps release faeces / eq (1) • helps egestion / eq (1) • helps in movement of food / eq (1)	**Reject** excrete faeces	**1**

Question Number	Answer	Additional guidance	Mark
4(b)	An answer that makes reference to three of the following: • <u>amylase</u> (1) • from salivary glands / from pancreas / eq (1) • starch / it, is digested into <u>maltose</u> (1) • <u>maltase</u> digests maltose (into glucose) (1)	**Accept** (released into / digested in) mouth **Accept** (released into / digested in) small intestine / duodenum / ileum **Accept** broken down / hydrolysed / turned into for digested	**3**

Question Number	Answer	Additional guidance	Mark
4(c)(i)	An answer that makes reference to the following: • 38 (mg per cm^3) (1)		**1**

Question Number	Answer	Additional guidance	Mark
4(c)(ii)	An answer that makes reference to the following order: • orange lemon (lime) apple grape (1)	**Accept** numbers from table i.e. 3 4 (lime = 7) 18 22	**1**

Question Number	Answer	Additional guidance	Mark
4(c)(iii)	An answer that makes reference to two of the following: • use a syringe / <u>graduated</u> pipette / measuring cylinder / burette / eq (1) • to measure volume / ml / cm^3 / dm^3 / mm^3 / eq (1) • as drop sizes vary / masses of drops vary / volumes of drops vary / eq (1) • mix / swirl / stir (solution after adding drops) / eq (1)	**Ignore** references to repeats / replicates **Ignore** pipette alone **Accept** Automatic pipette **Accept** <u>volumetric</u> pipette **Accept** balance / scale **Accept** use titration **Accept** mass / weight (of juice) **Accept** idea that method does not control drop size	**2**

(Total for Question 4 = 11 marks)

Question Number	Answer	Additional guidance	Mark
5(a)(i)	**B (X)** *A is incorrect ovulation occurs in the ovary* *C is incorrect as ovulation occurs in the ovary* *D is incorrect as ovulation occurs in the ovary*		**1**

Question Number	Answer	Additional guidance	Mark
5(a)(ii)	An answer that makes reference to two of the following: • (progesterone is released) after ovulation / in second half of cycle / eq (1) • maintains uterus lining / maintain endometrium / prevents menstruation / eq (1) • so embryo can implant in the lining / to support an embryo / to support fetus / eq (1)	**Accept** from corpus luteum / during luteal phase **Ignore** thickens **Accept** menstruation occurs when progesterone drops / uterus lining breaks down when progesterone drops **Accept** embed into uterus lining **Accept** prepare for implantation **Accept** to prepare for zygote / <u>fertilised</u> egg **Accept** zygote implants **Accept** reduce FSH / LH **Ignore** egg if not fertilised **Ignore** baby **Ignore** prepare for pregnancy**/** maintain pregnancy unqualified	**2**

Question Number	Answer	Additional guidance	Mark
5(a)(iii)	An answer that makes reference to three of following: 1. villi / villus (1) 2. large surface (area) (1) 3. (blood / capillaries) maintains gradient / makes steep gradient / eq (1) 4. thin / short distance / maternal and fetal blood are close / eq (1) 5. diffusion / active transport (1)	**Accept** short diffusion path for 2 marks	**3**

Question Number	Answer	Additional guidance	Mark
5(b)(i)	**C (haploid number of 23 chromosomes)** *A is incorrect as sperm are not diploid* *B is incorrect as sperm are not diploid* *D is incorrect as sperm have 23 chromosomes*		**1**

Question Number	Answer	Additional guidance	Mark
5(b)(ii)	An answer that makes reference to five of the following: 1. sperm movement decreases with concentration / eq (1) 2. no further effect between 0.4 and 0.8 / levels off after 0.4 / eq (1) 3. no effect on sperm concentration / small reduction / slight effect / unclear effect / fluctuates / eq (1) 4. <u>fertilisation</u> would not occur (if sperm cannot swim) / eq (1) 5. (sperm) needs to swim to <u>oviducts</u> / <u>Fallopian tubes</u> / fertilisation occurs in <u>oviducts</u> / <u>Fallopian tubes</u> / eq (1) 6. (may not work as) some sperm can (always) move / reach eggs / reach oviducts (with any concentration) / eq (1) 7. sample size is small / no repeats (so not reliable) / eq (1) 8. may not have same effect in humans / may have side effects / health impacts / humans would needs bigger doses / eq (1) 9. no mention of age of mice / eq (1)	**Accept** no need to increase dose from 0.4 to 0.8 / 0.4 would be best dose / eq **Accept** would need dose of over 0.4 to be effective / eq **Accept** sperm cannot reach egg **Accept** sperm and egg do not fuse / eq **Accept** not totally effective / eq **Accept** 5% of sperm can (always) move **Accept** humans are different to mice / needs testing on humans / eq **Accept** no mention of size of mice / eq **Accept** no mention of health of mice / eq	**5**

(Total for Question 5 = 12 marks)

<table>
<tr><th>Question Number</th><th>Answer</th><th>Additional guidance</th><th>Mark</th></tr>
<tr><td>6(a)(i)</td><td>

(S) linear scale for both axes with at (1)
(L) straight lines between points (1)
(A) axes with time on horizontal and mass on vertical (1)
(P) plots correct (+/- half square) (1)
(U) axes labelled and with units (minimum: mass / g and time / min) (1)

</td><td>at least two large squares on y axis and at least half of x axis

No Line mark if bar chart
<table>
<tr><th>Time in minutes</th><th>Mass of bag in g</th></tr>
<tr><td>0</td><td>15</td></tr>
<tr><td>5</td><td>17</td></tr>
<tr><td>10</td><td>20</td></tr>
<tr><td>15</td><td>23</td></tr>
<tr><td>20</td><td>26</td></tr>
<tr><td>25</td><td>27</td></tr>
<tr><td>30</td><td>27</td></tr>
</table>
</td><td>5</td></tr>
</table>

Question Number	Answer	Additional guidance	Mark
6(a)(ii)	A description that makes reference to the following: • mass increases (1) • levels off after 25 minutes / at 27 g / eq (1)	**Accept** increase until it reaches 25 (min) / 27 (g) = **2 marks**	**2**

Question Number	Answer	Additional guidance	Mark
6(a)(iii)	An explanation that makes reference to two of the following: • water moved into bag (by osmosis / diffusion) / eq (1) • (water moves) from a high water potential to a low water potential / from high concentration (of water) to low concentration (of water) / from dilute to concentrated / eq (1) • until pressure prevented more water entering / bag was full / bag was turgid / eq (1)	**Accept** water moves in / eq **Accept** down a water potential gradient **Accept** from low sugar concentration to high sugar concentration **Ignore** refs to equal concentrations of water inside and outside bag	**2**

Question Number	Answer	Additional guidance	Mark
6(b)(i)	A description that makes reference to two of the following: • use a <u>water bath</u> (1) • with a thermostat / use a (Bunsen) burner **<u>and</u>** thermometer / eq (1) • eye protection / eq / use tongs / gloves / eq (1)	**Accept** temperature regulated (water bath) / eq **Accept** spirit burner / hot plate / kettle / eq for Bunsen burner **Accept** thermostatically controlled water bath for **mp1 and mp2** **Accept** tie hair back **Accept** lab coat / apron **Accept** put Bunsen onto safety flame (when not being used)	**2**

Question Number	Answer	Additional guidance	Mark
6(b)(ii)	An explanation that makes reference to three of the following: • osmosis is faster / eq (1) • tubing fills faster / mass increases faster / so increase in mass will be steeper / will level off earlier / eq (1) • more (kinetic) energy (1) • so particles / water, will move faster / eq (1)	 **Accept** K.E. increases **Accept** more (frequent) collisions / eq **Ignore** refs to enzymes / denaturing	**3**

(Total for Question 6 = 14 marks)

Question Number	Answer	Mark
7(a)(i)	**C (secondary consumer and tertiary consumer)** *A is incorrect as it is not a primary consumer* *B is incorrect as it is not a primary consumer* *D is incorrect as it is also a tertiary consumer*	**1**

Question Number	Answer	Additional guidance	Mark
7(a)(ii)	An answer that makes reference to the following: • all of (the organisms of) <u>one</u> / <u>a species</u> in an area (at one time) / eq (1)	**Accept** amount of <u>a</u> species in an area / habitat / location eq **Accept** number of <u>a</u> species in an area / habitat / eq **Accept** number of <u>a</u> species in an ecosystem / eq	**1**

Question Number	Answer	Additional guidance	Mark
7(a)(iii)	An explanation that makes reference to three of the following: 1. (energy lost) from movement / eq (1) 2. (energy lost) from respiration / heat loss / eq (1) 3. (energy lost) as not some not eaten / are inedible / eq (1) 4. (energy lost) as some not digested / indigestible / faeces / egestion / eq (1) 5. (energy loss) due to death and decay / (energy lost) to other food chains / eq (1)		**3**

	6. (energy lost) from excretion / metabolic waste / urine / eq (1)	**Ignore** excrete faeces but can still award mp4 for faeces	

Question Number	Answer	Additional guidance	Mark
7(b)(i)	A description that makes reference to three of the following: • quadrat / square in gridded area (1) • place randomly / choose random coordinates / eq (1) • repeats / eq (1) • count limpets (in quadrat / square) / eq (1) • scale up for whole area multiply by area / eq (1)	**Ignore** quadra**n**t quadrats **= 2 marks** (mp1 and mp3)	**3**

Question Number	Answer	Additional guidance	Mark
7(b)(ii)	• time of day / location / area / position on shore / species of limpet / same day in August / eq (1)	**Accept** (day with same) weather **Accept** same type of limpet **Accept** same place **Ignore** season / time of year	**1**

Question Number	Answer	Additional guidance	Mark
7(b)(iii)	An answer that makes reference to five of the following: 1. fossil fuel use releases carbon dioxide (1) 2. carbon dioxide is a greenhouse gas / may cause global warming / eq (1) 3. increased temperature reduces limpet number / eq (1) 4. less food /energy, for starfish / dogwhelks / gulls / eq (1) 5. dogwhelks / gulls / starfish / secondary consumers / would decrease / eq (1) 6. algae would increase / less algae eaten / more food for periwinkles (1) 7. there are anomalies / outliers / not all close to line of best fit (1) 8. other factors may affect limpet population / other greenhouse gases may have effect / eq (1) 9. not done for long enough time so less reliable **OR** done for long time / 17 years so reliable / eq (1) 10. data only for one month / only August / only one location / only one shore / only looks at one species / only measures limpets / no information about rest of food web / eq (1)	**Accept** fossil fuel use may cause global warming / climate change / temperature rise / eq **Accept** starfish eat more dogwhelks / dogwhelks eat more periwinkles **Accept** less food for other trophic levels / consumers / eq **Accept** starve for less food **Accept** die for decrease **Accept** more algae for periwinkles **Accept** few points at low temperatures / below 15^{o}C / eq **Accept** named factors e.g. disease / predators / other pollutants e.g methane/ CFCs **Accepts** needs more repeats / there were no repeat experiments **Accept** needs to look at other species / other locations / other times	**5**

(Total for Question 7 = 14 marks)

Question Number	Answer	Additional guidance	Mark
8(a)(i)	• transgenic (1)		**1**

Question Number	Answer	Additional guidance	Mark
8(a)(ii)	A description that makes reference to three of the following: • plasmid (is used) (1) • restriction enzyme cuts gene / DNA / plasmid / eq (1) • ligase joins plasmid and gene / joins DNA / eq (1) • forming a recombinant plasmid / forming recombinant DNA / eq (1)	**Accept** viral vector **Ignore** restrictive / restricting enzyme **Accept** inserts / sticks for joins **Accept** lygase **Reject** lipase	**3**

Question Number	Answer	Additional guidance	Mark
8(b)(i)	An answer that makes reference to two of the following: • less night blindness / fewer eye problems / better vision / eq (1) • rice is a common food / part of many diets / common crop / cheap (for consumers) to buy / eq (1) • cheap to grow / easy to grow / easy to get large yields / eq (1) • less health care needed / less damage to economy / eq (1)	**Reject** scurvy / rickets / anaemia **Accept** rice is a staple food **Accept** (often) part of daily diet	**2**

Question Number	Answer	Additional guidance	Mark
8(b)(ii)	An answer that makes reference to two of the following: • (may grow in wild and) affect food chains / food webs / ecosystems / eq (1) • may <u>compete</u> with other species (in wild) / eq (1) • may interbreed with wild plants / genes may transfer into wild plants / eq (1) • people may think they are a risk to health / eq (1) • may be better to give people a more balanced diet / should use natural sources of carotene / eq (1)	**Ignore** ethical issues / playing God **Accept** <u>competition</u> with other species **Accept** may alter genes present in wild species **Accept** worried about side effects	**2**

Question Number	Answer	Additional guidance	Mark
8(c)(i)	An explanation that makes reference to four of the following: 1. all species decrease / eq (1) 2. insects increase after 3 months / from 6 months / eq (1) 3. beetles increase after 9 months / from 12 months / eq (1) 4. lizard numbers do not recover / stay low / do not increase / level off after 9 months / eq (1) 5. pesticide washes away / breaks down / eq (1) 6. pesticide passes along food chain to beetles / to lizards / eq (1) 7. <u>insects</u> become <u>resistant</u> / eq (1) 8. insects increase as there are fewer beetles eating them / beetles decrease as few insects to eat / lizards decrease as few beetles to eat / eq (1) 9. insects have short life cycles / lizards have long life cycle / eq (1)	**Accept** pieced together **Accept** biomagnification occurs / bioaccumulation occurs **Ignore** immune **Accept** food for species being eaten **Accept** lizards drop / do not recover as less food / fewer beetles to eat **Accept** beetles increase when more insects to eat **Accept** beetles increase when few lizards to eat them **Accept** lizards reproduce slowly / lizards produce few offspring **Accept** insects reproduce quickly / produce many offspring	**4**

Question Number	Answer	Additional guidance	Mark
8(c)(ii)	An answer that makes reference to two of the following: • (biological is) more specific / does not kill other species / eq (1) • (biological is) not toxic to humans / no residue left on plants / crops / eq (1) • (biological is) no development of resistance / eq (1) • (biological) lasts longer / no need to keep reapplying / eq (1) • no bioaccumulation / no biomagnification / does not pass along food chains / eq (1)	**Accept** converse for pesticides for all mps **Accept** does not kill pollinators **Accept** not absorbed by plants **Ignore** immune **Accept** only need to apply once	**2**

(Total for Question 8 = 14 marks)

Question Number	Answer	Additional guidance	Mark
9(a)	An answer that makes reference to one of the following: • only has an effect if two alleles are present (1) • no effect if dominant allele is present (1) • only has effect if dominant allele **not** present (1) • no effect in heterozygous (1) • only has an effect when homozygous / eq (1)	**Accept** expressed / eq for effect	**1**

Question Number	Answer	Mark
9(b)(i)	**C (tt and Tt)** *A is incorrect as both would be tasters* *B is incorrect as both would be tasters* *D is incorrect as neither would be tasters*	**1**

Question Number	Answer	Additional guidance	Mark
9(b)(ii)	An explanation that makes reference to the following: • correct parental genotypes (Tt and Tt) (1) • correct gametes (T or t and T or t) (1) • offspring: TT, Tt, Tt, tt (1) • 0.375 / 3/8 / 37.5 (%) (1)	**Accept** other letters (e.g. Nn) for all mark points **Accept** use of mixed letters (e.g. N and T) for **mp2, mp3, mp4** **Accept** mp1-3 from Punnett square **ECF** for mp2 and mp3 only if wrong parents	**4**

Question Number	Answer	Additional guidance	Mark
9(c)(i)	An explanation that makes reference to four of the following: • mutation occurs (1) • variation (in population) (1) • people do not eat poisonous plants / can detect poisonous plants / eq (1) • survive / eq (1) • reproduce / produced offspring / breed / eq (1) • pass on allele (to offspring) / eq (1)	**Accept** converse for mp3,4,5,6 if cannot taste PTC **Accept** gene passed on **Accept** mutation passed on **Accept** allele passed onto offspring for mp5 and mp4	**4**

Question Number	Answer	Additional guidance	Mark
9(c)(ii)	An answer that makes reference to two of the following: 1. people who taste PTC eat fewer vegetables / do not like taste of vegetables / eq (1) 2. (PTC tasters) get fewer vitamins / fewer minerals / less fibre / eq (1) 3. (PTC tasters) may develop scurvy / night blindness / constipation / eq (1) 4. heterozygotes carry a recessive allele / tasters may carry a non-tasting allele / heterozygotes can pass on a recessive allele / eq (1) 5. some humans lived in areas with few poisonous plants / had diets with fewer plants / had mainly meat-based diets / eq (1)	**Accept** converse for non-tasters **Accept** vegetables contain vitamins / minerals / fibre **Accept** converse for non-tasters **Ignore** nutrients **Accept** other correct named deficiency diseases **Accept** converse for non-tasters **Accept** people can be carriers of a recessive allele / eq **Accept** tasters may be carriers	**2**

(Total for Question 9 = 12 marks)

Question Number	Answer	Additional guidance	Mark
10	An answer that makes reference to the following: • C - change colour of light / wavelength of light / use different filters / eq (1) • O – same species / type / age / size / food / eq (1) • R – use several larvae with each light colour / repeat / eq (1) • M1 – measure distance larvae move / measure arc of dish / number of circuits / eq (1) • M2 - time / stated time / eq (1) • S1 & S2 **(two from)** – same humidity / food / light intensity / temperature / of dish / surface of Petri / same dish / eq (2)	**Ignore** same larva unqualified **Ignore** repeat with different colours **Accept** measure how long it takes to move set distance for M1 and M2 **Accept** time taken to do a number of laps / eq for two marks (M1 and M2) **Accept** speed = distance / time for M1 and M2 **Accept** clean dish between tests **Accept** alternatives for light intensity e.g. same lamp distance / same bulb / eq	**6**

(Total for Question 10 = 6 marks)