edexcel

Mark Scheme (Results)

January 2014

International GCSE
Biology (4BI0) Paper 2B

Edexcel Level 1/Level 2 Certificates
Biology (KBI0) Paper 2B

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

January 2014
Publications Code UG037561
All the material in this publication is copyright
© Pearson Education Ltd 2014

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	Notes	Marks
1 (a) (i)	kills/remove <u>bacteria</u> / kill/remove <u>fungi</u> / treat <u>bacteria</u> / <u>fungi</u> infections / eq;	Ignore kill pathogens / microbes Ignore fight bacteria / fungi	1
(ii)	penicillin + methicillin penicillin + mirabilicide methicillin + mirabilicide;	Ignore MRSA	max 1
(b) (i)	1. remove / kill / reduce bacteria/pathogens; 2. remove / kill / reduce infection / disease / maggots not infected / eq;	Ignore germs Ignore clean	max 1
(ii)	only digest dead tissue / only eat dead tissue / do not burrow into <u>live</u> flesh / eq;		1
(c)	protease / lipase / amylase / named digestive enzyme;		1
(d)	1. white blood cell; 2. phagocyte; 3. ingest / engulf / eat; 4. digest / breakdown / enzymes; 5. lymphocyte; 6. antibody / antitoxin; 7. antigen;	phagocytosis = 2	max 4
(e)	longer to work / expensive / eq;		1
(f)	1. <u>variation</u> / some <u>resistant</u> / some not <u>resistant</u>; 2. <u>mutation</u> / <u>mutates</u> / <u>mutated</u>; 3. <u>survive(s)</u> / <u>survival</u> / <u>survived</u> / not killed / eq; 4. reproduce / multiply / breed / eq; 5. pass on gene(s) / alleles / eq;	Ignore immune	Max 4
			Total 14 marks

<table>
<tr><th>Question number</th><th>Answer</th><th>Notes</th><th>Marks</th></tr>
<tr><td>2 (a)</td><td>1. (section of) DNA;
2. (codes) for a protein / polypeptide;</td><td>Ignore codes for characteristic</td><td>2</td></tr>
<tr><td>(b) (i)</td><td>guanine;</td><td>Allow phonetic spelling eg gwanine = 1</td><td>1</td></tr>
<tr><td>(ii)</td><td>420;</td><td></td><td>1</td></tr>
<tr><td>(c) (i)</td><td><table><tr><th>Chicken</th><th>Genotype</th></tr><tr><td>parent with all black feathers</td><td>C^BC^B / BB</td></tr><tr><td>parent with all white feathers</td><td>C^WC^W / WW</td></tr><tr><td>offspring with a mixture of black and white feathers</td><td>C^BC^W / BW;</td></tr></table></td><td></td><td>1</td></tr>
<tr><td>(ii)</td><td>0.5 / ½ / 50% / 2 in 4 / eq;</td><td></td><td>1</td></tr>
<tr><td></td><td></td><td></td><td>Total 6 Marks</td></tr>
</table>

Question number	Answer	Notes	Marks
3 (a) (i)	11.1;; give two marks if 11.1 in working but 11 on dotted line	Allow one mark for 11, 900 or 100 in working	2
(ii)	not eaten / eq; (plant) respiration; active transport;	Ignore loss by heat / movement / excretion / egestion / growth	2
(b)	1. mouth / saliva / salivary gland; 2. amylase / maltase / carbohydrase; (ONCE) 3. pancreas / <u>small</u> intestine / eq; 4. maltose / glucose;	3. Allow small intestine if linked to absorption 4. Ignore sugar	Max 3
			Total 7 marks

Question number	Answer	Notes	Marks
4 (a) (i)	helps combustion / helps burning / eq;		1
(ii)	1. increase surface area / more surface / longer distance / longer time / eq; 2. (better) heat transfer (to water) / heat more of the water / heat water better / eq;		2
(iii)	distribute heat / spread heat / spread temperature / even out temperature / make all the water the same temperature / eq;		1
(b) (i)	7.5;		1
(ii)	6300;	if not 6300 use number from (i) to calculate correct answer in (ii) eg 7140 is acceptable if 8.5 in (i)	1
			Total 6 marks

Question number	Answer	Notes	Marks
5 (a)	1. not full / less water / flaccid / shrink / eq; 2. cytoplasm does not fill cell / cytoplasm away (from cell wall) / membrane away from cell wall / membrane irregular shape / contents away (from cell wall) / eq; 3. plasmolysed / plasmolysis; 4. darker colour / eq;	Allow converse	2 max
(b)	1. (movement of) water; 2. dilute to concentrated / weak solution to a strong solution / down water potential gradient / high conc of water to low conc of water / eq; 3. selectively permeable membrane / eq;	Movement of water from a high conc to a low conc = 2, but water down a concentration gradient = 1 Membrane alone = 0	2 max
(c)	1. water leaves cell / eq; 2. higher concentration outside cell / dilute to concentrated / weak solution to a strong solution / down water potential gradient / high conc of water to low conc of water / eq; eq; 3. cell membrane shrinks from cell wall / cell dehydrates / plasmolysis / flaccid / eq;		max 3
(d) (i)	1. cells burst / eq; 2. water enters cells; 3. no cell wall / eq;	Ignore bigger idea	2 max
(ii)	1. crenated / buckled / shrink / smaller / flaccid / eq; 2. water leaves cells;	Ignore dehydrated	2
			Total 11 marks

Question number	Answer	Notes	Marks
6 (a)	1. enzymes; 2. optimum (pH); 3. denatured; 4. active site altered / eq; 5. maintain production / affect production / eq;	Ignore destroyed	3 max
(b)	1. water jacket / cooling water / eq; 2. insulation / eq; 3. temperature sensor / temperature probe / temperature recorder / thermostat / eq;	Ignore thermometer	max 2
(c)	1. oxygen; 2. aerobic respiration / eq; 3. mix / eq;		max 2
(d)	1. sterilise / aseptic / kills microorganisms / eq; 2. (cools to) water / condenses; 3. prevent competition from unwanted organisms / produce different product / eq; 4. prevent chemical contamination of product;		2 max
			Total 9 marks

Question number	Answer	Notes	Marks
7	1. microorganisms / bacteria / viruses / fungi / eq; 2. faeces / urine / urea / named nitrogenous waste; 3. respiration; 4. oxygen; 5. leaching; 6. nitrate / phosphate / potassium / ammonium; 7. algae / plants / producers / eq;	Ignore nitrogen / ammonia	7
			Total 7 marks

Total for Paper 60 Marks

Pearson Education Limited. Registered company number 872828
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE