Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education (9–1)

BIOLOGY **0970/32**

Paper 3 Theory (Core) **October/November 2018**

MARK SCHEME

Maximum Mark: 80

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2018 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

PUBLISHED

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

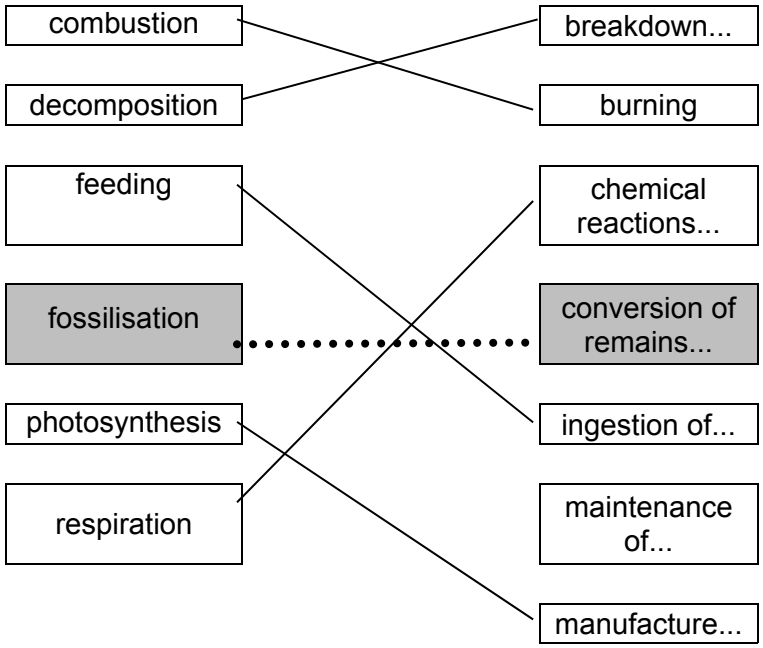
GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however**;** the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Mark scheme abbreviations

- **;** separates marking points
- **/** alternative responses for the same marking point
- **R** reject the response
- **A** accept the response
- **I** ignore the response
- **ecf** error carried forward
- **AVP** any valid point
- **ora** or reverse argument
- **AW** alternative wording
- **underline** actual word given must be used by candidate (grammatical variants excepted)
- **( )** the word / phrase in brackets is not required but sets the context

Question	Answer	Marks	Guidance
1	 ;;;;;	**5**	

Question	Answer	Marks	Guidance
2(a)(i)	**B**: no water / AW**;** **C**: low temperature / AW **;**	**2**	

Question	Answer	Marks	Guidance
2(a)(ii)	*prediction* – all / some / most (seeds), germinate **;** *explanation* – light not necessary for germination / all conditions for germination present / water **and** suitable temperature present **;** **OR** (for explanation) poor or no growth / die, as no light for photosynthesis / AW **;**	**2**	
2(b)(i)	91(%) **;;**	**2**	
2(b)(ii)	*Idea of:* something wrong with seed e.g. infertile / diseased / dead / immature / abnormal **;** OR *idea of* : lack of resources **;** e.g. no oxygen / need more time / not enough water / competition / too close together / insufficient nutrients / AVP **;**	**1**	

Question	Answer	Marks	Guidance
3	carbon ; oxygen ; nitrogen ; carbohydrate ; glycogen ; starch ; cellulose ;	**7**	carbon and oxygen in either order

Question	Answer	Marks	Guidance
4(a)	line drawn to an incisor tooth labelled incisor ; line drawn to a molar tooth labelled molar ;	**2**	
4(b)(i)	2 ;	**1**	
4(b)(ii)	4 ;	**1**	
4(b)(iii)	**D** clean / brush / wash / floss, their teeth more, thoroughly or frequently / good oral hygiene / use of mouthwash ; **D** (more / regular) visits to the dentist / hygienist / AW ; **D** used a fluoride toothpaste / drank water containing fluoride / AW ; **D** ate fewer sugary foods / fewer acidic foods or drinks / has less, bacteria or plaque ; **E** thinner layer of enamel ; **E** ref. to overcrowding / overlapping (of teeth) ; **E** had deficiency in calcium ; **E** had deficiency in vitamin D ; AVP ; e.g. adult **D** is younger	**2**	
4(b)(iv)	molar(s) ;	**1**	

Question	Answer	Marks	Guidance
4(c)	(bacteria) respire sugar ; (bacteria) produce acid ; (acid) dissolves enamel or dentine / AW;	2	

Question	Answer	Marks	Guidance
5(a)(i)	**H** – oesophagus ; **J** – pancreas ;	2	
5(a)(ii)	**N** line ending on the rectum ; **P** line ending on the small intestine ; **R** line ending on the small intestine ;	3	
5(b)(i)	assimilation ;	1	
5(b)(ii)	egestion ;	1	
5(c)(i)	(rate of reaction) increases **and** decreases / AW ; peak / optimum, at pH 8.1–8.7 / AW ; data quote for both axes with units ;	2	
5(c)(ii)	temperature ; concentration of substrate ; concentration of enzyme ;	1	

Question	Answer	Marks	Guidance
6(a)(i)	zygote ;	1	
6(a)(ii)	fertilisation ;	1	
6(a)(iii)	oviduct ;	1	

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>6(b)(i)</td><td><table><tr><th>individual</th><th>genotype</th></tr><tr><td>1</td><td>Tt ;</td></tr><tr><td>3</td><td>Tt ;</td></tr><tr><td>4</td><td>Tt ;</td></tr></table></td><td>3</td><td></td></tr>
<tr><td>6(b)(ii)</td><td>genotypes: Tt and tt ;

genotype ratio: 1 : 1 ;</td><td>2</td><td></td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>7(a)</td><td>leaves ;
evaporates ;
(spongy) mesophyll ;
diffusion ;
stoma(ta) ;</td><td>5</td><td>A stomata / stem</td></tr>
<tr><td>7(b)</td><td><table><tr><th>environmental condition</th><th>effect of a decrease on the rate of transpiration</th></tr><tr><td>humidity ;</td><td>increases ;</td></tr><tr><td>temperature ;</td><td>decreases ;</td></tr></table></td><td>4</td><td><table><tr><td>A light (intensity)</td><td>decreases</td></tr><tr><td>A wind (speed)</td><td>decreases</td></tr></table></td></tr>
</table>

Question	Answer	Marks	Guidance
8(a)(i)	transport oxygen / AW ;	**1**	
8(a)(ii)	contains haemoglobin ; biconcave (disc shape) / large surface area to volume ratio ; no, nucleus / (named) organelle ; AVP ;;	**2**	
8(b)	platelet(s) ;	**1**	**A** named clotting factors

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>8(c)(i)</td><td>coronary heart (disease) / CHD ;</td><td>1</td><td></td></tr>
<tr><td>8(c)(ii)</td><td>high (blood) cholesterol ;
high fat diet ;
obesity ;
high salt intake ;
(too much) stress ;
high blood pressure ;
(excess) alcohol consumption ;
smoking tobacco ;
(older) age ;
gender ;
genetic predisposition ;
lack of exercise ;
AVP ;</td><td>3</td><td></td></tr>
<tr><td>8(d)</td><td><table><tr><th>name of blood vessel</th><th>letter</th></tr><tr><td>aorta</td><td>B ;</td></tr><tr><td>pulmonary artery</td><td>G ;</td></tr><tr><td>renal vein</td><td>E ;</td></tr><tr><td>vena cava</td><td>F / D ;</td></tr></table></td><td>4</td><td></td></tr>
<tr><td>8(e)</td><td>heart / ventricles / atrium, pump / contract / AW ;
valves in the heart ;
valves in veins ;
valves prevent back-flow (of blood) ;
valves ensure blood does not go from ventricle to atrium ;
valves prevent blood flowing from, pulmonary artery / aorta, to ventricle ;
AVP ;;</td><td>4</td><td></td></tr>
</table>

Question	Answer	Marks	Guidance
9(a)	habitat loss / deforestation ; loss of biodiversity / extinction (of species) ; death of (wild) organisms / disruption of food web ; enhanced greenhouse effect / global warming ; more, carbon dioxide / methane ; pollution from urine / faeces ; pollution from farm machinery ; disease spreads (to wild populations) ; ref. to antibiotic resistance / inappropriate use of antibiotics ; AVP ;;	**4**	
9(b)	*fertiliser:* increase productivity / increase yield / addition of (named) nutrients to the soil / nutrients to the plant / increase soil fertility ; *herbicide:* kills or remove or prevents , unwanted plants or weeds / reduces competition (with weeds) / increases yield ; *insecticide:* kills or remove or prevents, insects / pests (feeding on the crop / animals) / increases yield ;	**3**	
9(c)	(named) factory waste / chemicals ; pesticides ; acid rain ; oil / petrol ; (named) rubbish / litter /AW ; (named component of) sewage ; nuclear waste ; AVP ;	**2**	