OCR
Oxford Cambridge and RSA

GCSE

Biology A

Unit **A163/02**: Ideas in Context plus B7 (Higher Tier)

General Certificate of Secondary Education

Mark Scheme for June 2015

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

Annotations

BP	Blank Page – this annotation **must** be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.
	indicate uncertainty or ambiguity
BOD	benefit of doubt
CON	contradiction
	incorrect response
ECF	error carried forward
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
NBOD	no benefit of doubt
R	reject
	correct response
	draw attention to particular part of candidate's response
	information omitted

Subject-specific Marking Instructions

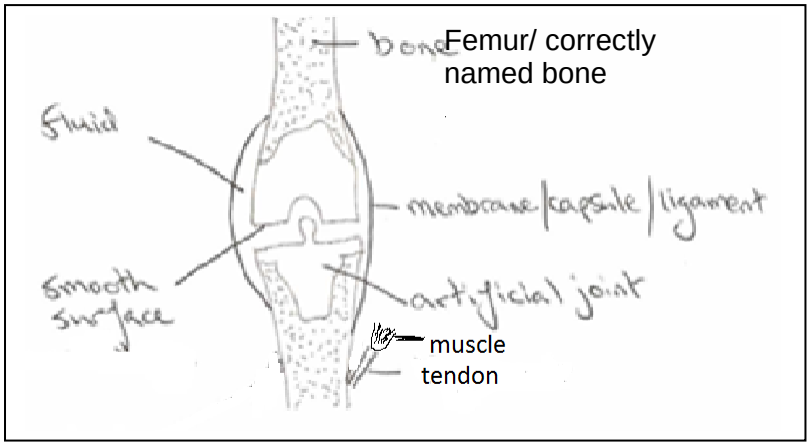
a. If a candidate alters his/her response, examiners should accept the alteration.

b. Crossed out answers should be considered only if no other response has been made. When marking crossed out responses, accept correct answers which are clear and unambiguous.

E.g.

For a one mark question, where ticks in boxes 3 and 4 are required for the mark:

Put ticks (✓) in the two correct boxes.	Put ticks (✓) in the two correct boxes.	Put ticks (✓) in the two correct boxes.
☐	☐	☒
☐	☐	☒
☒	✓	✓
☒	☒	✓
☐	☐	☐
This would be worth 1 mark.	This would be worth 0 marks.	This would be worth 1 mark.

Question			Expected Answers	Marks	Additional Guidance
1	a		**[Level 3]** Includes three areas. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Includes two areas. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Includes one area only. Quality of written communication impedes communication of the science at this level. (1 – 2 marks) **[Level 0]** Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)	6	**This question is targeted to include grades D up to A.** **Labels on diagram may include:** **NB labels and structures may be in different positions.**  **Properties** • Membrane/capsule – tough • Bone – hard / strong • Tendon – non stretchy • Ligament – stretchy / elastic • Muscle – contracts • (synovial) fluid lubricates **Explanations may include:** • Membrane/capsule – keeps in fluid/ makes fluid • Bone – to support / protect • Tendon – so muscle can pull on / move the joint / connect muscle to bone • Ligament – holds joint together / connects bone to bone • Muscle - so it can move the bone/joint • fluid – so bone does not wear / reduce friction **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**

Question			Expected Answers	Marks	Additional Guidance
	b		Dislocation; Torn ligament or tendon;	**2**	Do not credit sprain / strain / break/ overextension/ pulled
	c		Rest Ice Compression Elevation	**2**	Four correct (in any order) equals 2 marks Two or three correct equals 1 mark RICE = 0
	d		*Any 1 from…* Idea of returning joint to normal / rehabilitation / recover; Use of exercise / strengthen;	**1**	
			Total	**[11]**	

Question			Expected Answers	Marks	Additional Guidance
2	a		White blood cells fight infection / fight microbes/ produce antibodies; Platelets clot blood; Plasma transports or carries (substances / cells);	3	
	b		No nucleus; Concave / bi concave / large surface area;	2	
	c	i	Pulmonary artery; aorta; Vena cava; Pulmonary vein;	3	Any three for 3 marks Do not credit left aorta
		ii	Stop blood flowing backwards / into Atrium;	1	**Allow** blood flow in one direction
		iii	Idea that blood goes through the **heart twice**; To the lungs and to the body;	2	
		iv	*Any two from* Only one ventricle / 3 chambers; Blood to body will not contain as much oxygen / not as efficient transport of oxygen; Blood with oxygen mixing with blood without oxygen;	2	**Accept** 'single chamber on the bottom'
		v	*Any 2 from:* mechanical valve – better survival rate ORA; **Identification** of the outlier / anomaly; There is no data after 15 years:	2	**Ignore** 'mechanical valves last longer' **Ignore** longer life expectancy Identification means either ' tissue valve' or '10 years'
		vi	How many patients were involved in each study; Were patients in each group matched; Age; Sex; Lifestyle / example of lifestyle e.g. drinking or smoking; Medical history; BMI / mass; Fitness;	2	
			Total	[17]	

Question			Expected Answers	Marks	Additional Guidance
3			**[Level 3]** Comments refer to three areas. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Comments refer to two areas. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Comments refer only to one area. Quality of written communication impedes communication of the science at this level. (1 – 2 marks) **[Level 0]** Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)	6	**This question is targeted up to grade A** **General points may include:** • cold water loses heat /uses water to cool down • fat insulates / stops heat loss • idea that sun warms • brain/hypothalamus monitors body temperature **Processes for keeping warm may include:** • vasoconstriction/blood vessels constricting • reduce blood flow to surface • (vasoconstriction) so heat retained / reduces heat loss • **allow** shivering (to generate heat) **Processes for keeping cool may include:** • vasodilation/blood vessels dilating • Increased blood flow to surface •(vasodilation) so heat / energy lost (from surface) • evaporation **Ignore** ref to capillaries dilate or contract **Ignore** ref to sweating **Ignore** ref to homeostasis and negative feedback **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
			Total	**[6]**	

Question			Expected Answers	Marks	Additional Guidance
4	a		*Max 2 from one area* *For -* Carbon not (shown) entering / leaving the system; Energy is not (shown) entering or leaving the system; Idea of recycled / no waste; *Against -* Fossil fuels lock carbon away for a long time; Carbon entering the atmosphere faster than leaving it; Fossil fuels used up faster than replaced; Sunlight / energy entering or leaving system;	3	**Ignore** any reference to **energy** being recycled/ not wasted. Do not credit “no recycling”
	b		Outputs / losses = inputs / gains; OR Completely supported by what they produce;	1	**Ignore** closed loop
			Total	[4]	

Question			Expected Answers	Marks	Additional Guidance
5	a		**Level 3 (5–6 marks)** Answer includes points from three areas. Quality of written communication does not impede communication of the science at this level. **Level 2 (3–4 marks)** Answer includes points from two areas. Quality of written communication partly impedes communication of the science at this level. **Level 1 (1–2 marks)** Answer includes points from one area. Quality of written communication impedes communication of the science at this level. **Level 0 (0 marks)** Insufficient or irrelevant science. Answer not worthy of credit.	6	**This question is targeted include grades B up to A*** **Relevant scientific points concerning eutrophication include:** • Idea that **nitrates** cause algal bloom / growth / build up • Algae cut off sun(light) • Less photosynthesis • ….so algae / plants die • (Bacteria) decompose algae • **Bacteria** use up oxygen • Fish / organisms die due to lack of oxygen / need oxygen to survive **Relevant scientific points concerning table include:** **(Pond A)** • High level nitrate / 61 • Low level of oxygen / 2 **(Pond B)** • Low level of nitrate / 8 • High level of oxygen / 13 **Relevant scientific conclusions include:** • Pond A / pond with highest nitrates is eutrophic • Pond B / pond with lowest nitrates is healthy / not eutrophic SSU to add more **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
	b	**i**	Idea that pesticide could be toxic / poisonous / harmful to people or living things/ environment e.g. bioaccumulation/decrease in biodiversity;	**1**	**Ignore** eutrophication **Ignore** contamination
		ii	**How** bad/ serious/ harmful/ damaging/ toxic/ dangerous the risk/ effect is; **Chances/ likelihood** of risk happening;	**2**	**Ignore** any ideas of dosage/ numbers of people affected

Question			Expected Answers	Marks	Additional Guidance
		iii	Benefits are high or example of benefit (e.g. increased yield/increased profit); Risk is low;	2	Benefits outweigh risk = 2 marks **Accept** have confidence in scientists or farmers = 1 mark
	c	i	3 in 1000 or 3/1000 or .003 or 0.3% (2);	2	**ignore** 3:1000 **Allow** 1 in 1000 for 1 mark **Ignore** 2/1000
		ii	Perceived - Increase of **50%** sounds high; Calculated - But it is **only** 3 in 1000 / increase of **only** 1 in 1000 ;	2	**ecf from ci**
			Total	**[15]**	

Question			Expected Answers	Marks	Additional Guidance
6	a	i	Non specialised/undifferentiated; Can become any type of cell/specialised cell;	2	**Ignore** just 'other cells', just 'another cell'
		ii	stem cells **injected into brain**; Stem cells turn **into**/ grow **into** nerve cells; to produce dopamine;	3	**Ignore** stem cells grow/replicate/make/replace/repair nerve cells
	b		*Any 2 from …..* How to power it / battery replacement / may run out; Rejection; Radio /electrical/ magnetic interference; (Constant) pace of the pacemaker may be too fast / too slow / inadequate (to meet the demands of the body);	2	**Ignore** idea of pacemaker failure **Ignore** idea of faulty battery
			Total	[7]	
			Paper total	60	

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