Mark scheme for Year 1 online May test.

This mark scheme also includes youtube links to go through the key exam skills to answer these questions. Watch the videos as you go through and correct your paper to help you identify key exam skills you can develop further.

Q1. Nucleic acid booklet.

You tube: **https://www.youtube.com/watch?v=f-v93Vdx4rI&feature=share**

(a) (i) 8;

Accept eight

1

(ii) **Phosphodiester** (bond);

Accept phonetic spellings

1

(iii) 1. DNA helicase – (unwinding DNA and) **breaking hydrogen** bonds / bonds **between chains** / bases / strands;

2. DNA polymerase – joins (adjacent**) nucleotides OR** forms **phosphodiester** bond / sugar-phosphate backbone;

1. Accept H bonds.

1. Accept hydrolyses for breaks

2. Reject forms hydrogen bonds (between nucleotides / bases)

2

(b) 1. ATP has ribose **and** DNA nucleotide has deoxyribose;

2. ATP has 3 phosphate (groups) **and** DNA nucleotide has 1 phosphate (group);

3. ATP – base always **adenine and** in DNA nucleotide base can be different / varies;

Both parts of each MP needed

3. Reject Uracil / U

3. Accept C, T or G for different bases

Accept annotated diagram for any of the three marks

2 max

(c) 1. **One of** RNA / ribonucleic acid(s) / nucleotide(s)/nucleic acid(s) / rRNA / ribosomal RNA / ribosomal ribonucleic acid

and

one of protein(s) / polypeptide(s) / amino acid(s) / peptide(s) / ribosomal protein;

Reject DNA, deoxyribonucleic acid, tRNA, transfer RNA, transfer ribonucleic acid, mRNA, messenger RNA, messenger ribonucleic acid.

Ignore enzyme(s), base(s).

1

(d) 1. **mRNA** binds to **ribosome**;

2. Idea of **two codons** / binding sites;

3. (Allows**) tRNA with anticodons** to bind / associate;
4. (Catalyses) formation of **peptide bond between amino acids** (held by tRNA molecules);
5. **Moves along** (mRNA to the next codon) / translocation described;

Assume 'it' refers to ribosome.

3 max

(e (i) TGCGTAATA;
Any errors = 0 marks

1

(ii) 1. Introns (in pre-mRNA);
2. Removal of sections of (pre-mRNA) / splicing;

***Introns removed' scores 2 marks**.*

Reference to 'introns present in mRNA' disqualifies mp1 but allow ECF for mp2.

Accept for 1 mark mRNA contains only exons.

2

(13 marks)

Q2. Mitosis and Meiosis booklet

You tube link: https://www.youtube.com/watch?v=ZAVxOf9OffA&feature=share

(a) To ensure the **colour** is the same **at the start**;

1

(b) Yes – curve on graph **with bromelain** present remains **approximately constant** / rises very slightly;
Would decrease if killing of cells occurred / would increase if cells still dividing;

2

(c) The fast**er** the rate of division the fast**er** the cancer would grow;
By measuring rate of cell division you could see **how effective the treatment was**;

2

[5]

Q3. (i) 18;

Do not accept 17.5

1

(ii) 10;

1

(c) (i) Two marks for correct answer of 19.68 or 19.7;;

Accept 19hrs 41mins

One mark for incorrect answers in which candidate clearly multiplies by 0.82;

Allow one mark for incorrect answers that clearly show 82% of 24

(hours)

2

M4. (a) (i) 22;

1

M5. Species and Taxonomy/Classification booklet

You tube link: https://www.youtube.com/watch?v=Y9rKtVbhorY&feature=share

(a) (i) there are **no fertile hybrids** found in the overlapping regions;

1

(ii) even if mating took place, there would be no fertile hybrids / different chromosome number / gene pool / evolutionary history / many morphological / biochemical / serological differences;

1

(b) (i)

Kingdom	**Animalia / Animals**
Phylum	Chordata
Class	Mammalia
Order	Xenarthra
Family	Dasypodidae
Genus	***Dasypus***
Species	***(D.) novemcinctus***
1 mark per correct column	

2

(ii) **Family**, as all three belong to different genera;

1

M6. (a) 1. Recognise / identify / attract same species;

Ignore: references to letting them produce fertile offspring

2. Stimulates / synchronises mating / production / release of gametes;

3. Recognition / attraction of mate / opposite sex;

Accept finding a mate

Accept: gender

4. Indication of (sexual) maturity / fertility / receptivity / readiness to mate;
5. Formation of a pair bond / bond between two organisms (to have / raise young).

3 max

(b) 1. **Use a (real) male** (with intact wings / no wing removed);

Mark ignoring reference to birds / or other types of animals

Accept: use a real cricket, since only males sing

2. Determine (percentage) response (of females **compared with L**).

*Accept: compare results with **L***

2

(c) 1. Lowest / only 30% courtship with no song / K / (or) courtship still occurred when no song played / **K**;

Note: throughout, for courtship accept response / stimulation / reaction

Neutral: references to methodology

Answer must make clear there is no song / version K

2. Reduced courtship when no ticks / M / there is some courtship when no ticks / M;

3. Reduced courtship when no chirps / N / there is some courtship when no chirps / N;

Accept: use of figures from the table in an explanation

4. (So) courtship must involve a visual stimulus / other factor involved;

5. Chirps more important as lowest courtship when none / N / ticks less important as similar courtship when changed / M;

Must make comparison to gain mark

6. Data only show presence and absence of chirps / 0 and 7 chirps.

Note: 'courtship still occurred when no sound played so a visual stimulus / other factor / something else (e.g. pheromone?) must be involved'

= 2 marks

4 max

M7. Evolution Booklet

You tube link https://www.youtube.com/watch?v=a5f6gYaURCQ&feature=share

(a) **Small surface area to volume ratio** / more fat;

Lose less heat (to the environment) / for insulation when they are sitting on eggs;

2

(b) (i) The **further north** / higher the latitude, **the higher the percentage** (of white snow geese);

1

(ii) **Snow lying longer** / melts slower further north / at greater latitudes;

White geese better **camouflaged** (further north);

Predation linked to survival / reproductive success;

***Q** In order to gain the last marking point, candidates must explain how survival or reproductive success is affected.*

3

(c) Snow melts earlier / snow melts further north / less snow;

White geese decreasing as less well camouflaged / at disadvantage / blue geese increasing as better camouflaged / at an advantage;

2

(d) (i) Stabilising;

Do not accept stable

1

(ii) Few geese survive at the extremes / most survive from the middle of the range;

1

[10]

M8. Biodiversity and Populations part 1

You tube link: https://www.youtube.com/watch?v=0_fvt43ydMk&feature=share

(b) (i) Correct answer of 6.97 to 7 = 2 marks;

One mark for 6320 as numerator or 906 as denominator;

2

(ii) 1. Decrease in variety of plants / fewer plant species;

1. Accept: reference to monoculture or description

1. Neutral: fewer plants

2. Fewer habitats / niches;

2. Neutral: fewer homes / less shelter

3. Decrease in variety of food / fewer food sources;

3. Neutral: less food

3. Accept: less variety of prey

3

M9. Lay tape / rope at right angle / perpendicular to road;
Take samples at regular / stated intervals;
Using a quadrat;
Count numbers / percentage cover of dandelions;
Use several transects;

4 max

Q10 .(a) 9 (hours);;

If multiply 75 by 0.11 and 0.23 but wrong answer, then 1 mark

*Accept for **one** mark if multiply 75 by two wrong proportions near to 0.11 ± 0.01 and 0.23 ± 0.01 or multiply by the difference between the two (wrong) proportions*

2

(b) (Yes because)

1. Both/Each species (mean) time spent looking around greater where many predators;
2. Differences (appear to be) significant because SDs do not overlap;

(No because)

3. Wildebeest spend same (mean) time looking around where many predators as impalas where few predators;
4. Don't know what they are looking for (when heads up);
5. Habitats might be different in different areas (which could affect the behaviour);

Accept 'mean proportion' means 'time'

1. Require idea of both, not just quoting numbers

2. This point must be in the context of point 1

2. Do not accept results significant

2. Accept 'because bars do not overlap'

2. Do not accept SE for SD

3. Accept overlap in SD as equivalent to same time

5. Ignore 'other factors' unqualified and discussions of experimental variables

4 max

Now complete the reflection sheet below. Return JUST THE REFLECTION SHEET to your Biology teacher.

Biology reflection of your learning record

Name: _____

Exam grade: _____ **%:** _____ **Grade:** _____ **Meg:** _____

A01

Demonstrate knowledge and understanding of scientific ideas, processes, techniques & procedures

Usually 30-35%

YOUR MEMORY

1a(ii)	1	
1a(iii)	2	
1b	2	
1c	1	
1d	3	
1e(ii)	2	
5a(ii)	1	
5b(i)	2	
6a	3	
7d(ii)	1	
8a(ii)	3	
9	4	
Total	25	

A02

Applying knowledge and understanding of scientific ideas, processes, techniques & procedures:

- Theoretical, practical content
- Handling qual/quant data (Math content)

Usually 40-45%

APPLYING YOUR MEMORY

1a(i)	1	
1e	1	
2a	1	
2c	2	
3a(i)	1	M
3a(ii)	1	M
3a(iii)	2	M
4	1	
5a(i)	1	
5b(ii)	1	
7a	2	
7b(ii)	3	
7c	2	
7d(i)	1	
8a(i)	2	M
10(a)	2	M
Total	24	
Maths	8	

A03

Analyse, interpret and evaluate scientific info, ideas and evidence

Including practical skills

Usually 25-30%

2b	2	
6b	2	
6c	4	
7b(i)	1	
10b	4	
Total	13	

How to improve:

Focus your time on HIGH IMPACT revision activities.

Low impact revision activities: Rewriting notes/poster/flashcard, re-reading notes, re-organising notes, watching videos, revising booklets you are confident with again.

You need to know what is in your memory for your exam and how to use the memory in the exam.

Are you spending all your time preparing to complete exam questions instead of completing exam questions?

A01:

Look at notes of a peer who is achieving higher grade and ask how they complete their revision and time.

Check your revision materials are mark scheme perfect by completing exam questions/past papers under exam conditions then marking questions and adding details to revision material.

Before starting to revise a topic complete some exam questions under time conditions to highlight what is also in your memory

Ask family/non-biologists to test you on recalling your revision materials from memory.

A02:

Before starting to revise a topic complete some exam questions under time conditions to highlight what is also in your memory.

Complete exam questions/past papers under exam conditions then mark your answers by highlighting key information in your answers.

Hand in exam questions to be marked to get feedback.

Annotate information in comprehension/table/data questions BEFORE answering the questions to learn to understand the information and identifying common questions. Turn this information into diagrams to help your understanding.

Use past papers to identify topics to prioritise.

Make links between topics/revision materials to help understand the bigger picture

A03:

Same as A02

Use maths and physics tutor to review practical procedures

It doesn't matter if you have seen the exam question before. What is important is; if you have seen it before did you get 100%? If not then you have not committed the information to memory so you need to do the exam again.

Are you clear about what you hope to achieve in A Level Biology? Explain what it is you hope to achieve?

_____
_____

_____
_____

Do you take responsibility for your own learning/ progress?

_____
_____

Do your habits, work rate, behaviours and effort reflect what it is you hope to achieve?

_____
_____

How are you revising? Are you aware of how effective this method is?

Rate how effective you think these revision techniques are:

Highly effective Quite effective Not very effective.

Is your revision up to date?

Yes No

Are you proud of your efforts and your work so far? Rate your effort:

Excellent effort and commitment Good effort and commitment Low effort and commitment.

Have you used the additional exam question on Connect to complete practice exam questions for specific topics? How regularly do you use this? Do you mark the exam questions after completing them?

_____
_____

After each topic do you review your Biology notes adding information to revision materials

Regularly Occasionally No.

Have you asked your teacher for help on a homework or topic area outside of class?

Regularly Occasionally No.

Do you go over revision materials/exam questions from previous topics?

Regularly Occasionally No.

Is your file fully organised?

Yes No

Exams are excellent methods to identify key topic areas to focus on. These topics areas need addressing now to make your learning effective.

Identify your priority topics (AO1)

_____ _____ _____ _____

Identify your priority exam skill

_____

Identify 3 things you are going to change so you are raising/maintaining your grades.

_____
_____

_____
_____

_____
_____