EXAMINATIONS COUNCIL OF ESWATINI
Eswatini General Certificate of Secondary Education

BIOLOGY **6884/02**

Paper 2 Structured Questions **October/November 2020**

Confidential

MARK SCHEME

{6884/02}

MARKS: 80

This document consists of **7** printed pages.

INTRODUCTION TO MARK SCHEME

MARKING

1. Mark crossed out answers when nothing else has been written.

2. If the candidate has left an answer blank, record this as NR (no response) in the marks column.

3. Apply the agreed final mark scheme, making professional informed judgements about what the candidate has written. You need to decide if the point made is equivalent to the point in the mark scheme, or if it is not, based on your knowledge of the subject and understanding of the mark scheme.

GENERAL NOTES

Mark Schemes will use these abbreviations:

- ; separates marking points
- / separates alternatives for a marking point
- R reject
- A accept (for answers correctly cued by the question, or
- AW alternative wording (where responses vary more than usual)
- MP mark point- used in guidance notes when referring to numbered marking points
- ORA or reverse argument/reasoning
- OWTTE or words to that effect
- I ignore/irrelevant – this response gains no mark, but any following correct answers can gain marks
- ( ) the word/ phrase in brackets is not required to gain marks but sets context of response for credit. e.g. (waxy) cuticle. Waxy not needed but if it was described as cellulose cuticle then no mark.
- <u>small l</u> underlined words- this word only (grammatical variants excepted)
- D, L, T, Q quality of drawing/ labelling/ table / writing as indicated by mark scheme
- max indicates the maximum number of marks that can be given

INSTRUCTIONS FOR EXAMINERS

Correct biology

Always credit correct statements even if they follow incorrect statements. Usually apply this to sentences, but use judgement if candidate writes lengthy sentences.

Marking questions where a specified number of responses is indicated

Mark first answer on each row unless considered neutral.
If several answers on first line and no answers on subsequent lines, mark all answers on first line up to the number specified in the question.

Do not mark answers in excess of number indicated by the question.

Calculations

Award full marks for correct answer with units even if no working shown.

If units not given, then award one mark for numerical answer.

If no answer or incorrect answer award one mark for correct working.

Errors carried forward

Examples:

If structure is identified incorrectly, then apply error carried forward (ecf / transfer error (TE)) rule for subsequent answers.

If first answer using information provided is incorrect allow ecf / TE for next question.

Vague answers

Do not allow ‘particles’ in place of molecules

Crossed out work

Mark crossed out work if there is no second attempt at the answer. Otherwise ignore it;

Watch for:

- context and scientific correctness (don’t just spot key words / treat separate sentences independently.
- spellings that matter (e.g. mitosis / meiosis, glucagon/ glycogen, ureter / uterus / urethra;
- spellings / grammatical constructions that don’t matter (for many candidates, English is their 2nd or 3rd language);
- lists that include wrong points (e.g. if 3 points are needed and 5 given, mark the first 3 only);
- only one mark should be awarded per numbered line, unless some of the lines are left blank, in which case the 2nd or 3rd idea on the first line can be marked as well;
- mark all the candidate’s answers wherever they have written them.

1 mammal;
primates;
hominids;
Homo;
sapiens; [5]

[Total: 5]

2 **(a)** **(i)** optimum enzyme activity; [1]

(ii) fermentation/ anaerobic respiration;
lactose changed to lactic acid; [2]

(b) ref. to natural selection of mutated bacteria;
antibiotic kills normal bacteria and leave mutated bacteria;
mutated bacteria reproduce;
passing on the mutated gene; [4]

[Total: 7]

3 **(a)** oxygen is needed for aerobic respiration + not needed in anaerobic respiration;
more energy released in aerobic than anaerobic;
production of carbon dioxide in aerobic + no carbon dioxide produced in anaerobic;
lactic acid produced in anaerobic + not in aerobic ; [max. 2]

(b) **(i)** lower heart rate/pulse ;
the heart rate for **B** returns to normal faster;
B exercises more regularly;
larger cardiac output/ improved circulation/ larger blood volume; [max. 3]

(ii) faster blood flow;
more oxygen/glucose to muscles;
faster respiration/more energy released; [3]

(c) how it develops:
blockage of coronary arteries;
clot formation;
blood flow restricted;
heart muscle starved of oxygen and nutrients (glucose);
heart muscle stops contracting; [max. 3]
prevention:
stop smoking/less fat diet especially animal fat/avoid stress; [1]

[Total: 12]

4 **(a)** fovea; **R** retina
sensory neurone;
relax; [3]

(b) reduces light entering the eye;
preventing damage of the retina;
pupil constricts; [max 2]

(c)

	in eye	**hormones**
messages:	electrical impulses +	chemicals (hormones);
transmission:	in neurones +	in blood (stream);
speed of transmission:	very quick / rapid / fast+	slow;
effect:	localised +	affect several target organs / AW;

[max. 3]

[Total: 8]

5 **(a)** **(i)** meiosis; [1]

(ii) 46; [1]

(iii) many/ a lot/ more mitochondria;
release a lot of energy + for movement; [2]

(b) **(i)** a characteristic in which the gene responsible;
is located on a sex chromosome; [2]

(ii) P1 genotype X^BX^b + X^bY;
Gametes X^B X^b X^b Y; ecf
Fertilisation
F_1 genotype: X^BX^b X^BY X^bX^b X^bY; ecf
F_1 phenotype: carrier female, normal male, colour blind female, colour blind male;
chances of a colour blind daughter = ¼ / 25%; ecf [5]

(iii) trait is carried on X chromosome;
father donates Y chromosome which does not contain the allele; [2]

[Total: 13]

6 **(a)** to allow light to pass through; [1]

(b) increases temperature/ more heat;
more carbon dioxide;
more photosynthesis;
faster growth/ bigger produce/ yield; [max. 3]

(c) chlorosis/yellowing of the leaves;
less absorption of light energy;
less photosynthesis;
less amino acids/ proteins; [4]

[Total: 8]

7 **(a)** **(i)** **E**- red blood cell; [1]

(ii) ingest/ engulf + digest/ kill bacteria; [1]

(iii) change of (soluble) fibrinogen;
to (insoluble) fibrin; [2]

(b) **(i)** a disease causing organism; [1]

(ii) 1: weakened/killed form of pathogen/ virus (vaccine) injected;
2: lymphocytes produce antibodies;
3: pathogen destroyed, memory cells remain produced;
4. pathogen invades/ attacks;
5: antibodies produced + to kill pathogen/ virus;
6: pathogen/ virus completely destroyed; [6]

(iii) short-term defense against a pathogen by antibodies;
antibodies acquired from another (named) individual/ by injection; [2]

[Total: 13]

8 **(a)** **(i)** proteins;
molecules too large to pass through; [2]

(ii) ref to ultra-filtration/high pressure;
glomerular filtrate;
urea not re-absorbed;
re-absorption of water increases concentration; [max. 3]

(iii) diabetic;
glucose in urine; [2]

(iv) water leaves the cells and enters the blood;
by osmosis;
resulting in dehydration;
less chemical reactions within cells; [max. 3]

(v) through selectively permeable tubing;
diffusion/ ref. to constant change of dialysate/maintain high conc. gradient/ low con. of unwanted substances in dialysate; [2]

(b) vasodilation/ arterioles dilate/ AW;
heat lost to the environment (radiation);
increased/ more blood flow to the skin; [max 2]

[Total: 14]