EXAMINERS' REPORT

IM BIOLOGY

FIRST SESSION 2018

L-Università ta' Malta

MATSEC
Examinations Board

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General Statistics

The distribution of grades awarded in the May 2018 session is given in the table below.

Table 1: Distribution of grades

GRADE	A	B	C	D	E	F	abs	TOTAL
NUMBER	6	23	44	51	40	67	35	266
% OF TOTAL	2.3	8.6	16.5	19.2	15.0	25.2	13.2	100

General Comment by Markers

The overall performance in Section A was very weak. Approximately 50% of candidates gained 50% of marks allotted for Section A. The same can be said about Section B.

Yet this year again, the extremely low marks of certain candidates might reflect that some candidates are sitting for the exam before they cover the whole syllabus, a practice which should be discouraged.

Considering that several answers showed lack of knowledge, the markers comment on degree and style of studying of this cohort of candidates. Indeed, some questions could have easily been set at SEC Level Biology.

Responses given by the candidates indicate that they did not understand particular questions and either did not use biological terms to answer them or did not use them correctly.

Many candidates still seem unable to express themselves coherently in English and in a consistent and logical manner. Poor spelling of biological terms and very brief answers, particularly in Section B, were noted.

Many candidates did not write the number of the questions answered in the space provided on the front page of the scripts for Section B.

Section A

Question 1

Overall the performance in this question was very poor, with most candidates rarely gaining more than half of the marks allotted.

a. Most answers reflected a confused idea of what atoms and / or ions are. Typical misconceptions included: the atom is the basic unit of life, the atom is part of an ion (or vice versa), the atom is a molecule, the atom is an element.

   Correct answers often suggested that ions are charged but did not specify that ions could both be positively or negatively charged.

Several candidates did not give an example of an atom or an ion. Incorrect examples often included water as an example of either an atom or an ion. Sub-atomic particles were also incorrectly suggested as particular examples.

b. i) Generally candidates correctly stated the role of water as a transport medium in animals or in plants. However they rarely linked this property to the fact that water is a universal solvent or that it is a liquid at room temperature.

ii) Although answers often referred to sweating, reference to a high latent heat of vaporisation of water was omitted. Most incorrect answers referred to the high specific heat capacity of water instead.

Question 2

a. Majority of candidates identified all structures correctly. Most incorrect answers included reference to sperms being ejected from the penis rather than being ejected into the upper vagina / base of the cervix. Incorrect references to fertilisation occurring in the uterus rather than the oviducts were frequent.

b. i) Often answered correctly. Incorrect responses often linked FSH to ovulation.

ii) Answered correctly by vast majority of candidates. However some candidates did not clearly link the function of testosterone to males and thus were not awarded marks. Typical examples in this regard include: testosterone gives rise to secondary sexual characteristics; or testosterone causes hair to grow.

Question 3

a. Most candidates correctly linked the palisade cells to photosynthesis but did not state that close packing of the cells ensures a higher rate of photosynthesis.

b. Most candidates linked the opening and closing of stomata to either gaseous exchange or control of transpiration rather than both. Incorrect responses focused on osmosis in guard cells.

c. Most candidates correctly linked the presence of a waxy cuticle to reduction of water loss or the transparent nature of the cuticle to allowing light through. Yet, the two points were rarely mentioned together.

Question 4

a. Responses varied. Some candidates correctly identified the labelled parts of the brain and their respective functions. Others presented incorrect answers. A common misconception linked the medulla oblongata to control of heart beat rather than heart rate.

b. i) Vast majority of answers were correct. Incorrect responses often included labelling the receptor or the effector as the sensory or the motor neurone respectively. Occasionally the inter-neurone was incorrectly labelled as the motor neurone.

ii) Vast majority of answers were correct.

Question 5

Performance in this question was extremely poor, with most candidates rarely scoring more than 5 out of 11 marks allotted.

a. Majority of candidates were not able to state what a restriction enzyme is. Answers often relied on the vernacular meaning of the term restriction. Thus typical answers referred to 'enzymes restricting processes in a cell', or 'enzymes restricting DNA'. Others wrote the definition of any enzyme. Partially correct answers referred to restricting enzymes being responsible for cutting DNA without referring to restriction sites.

b. Vast majority of answers were incomplete or incorrect often repeating the information in the answer to part 5 a.

c. Majority of answers were incorrect because they repeated information in the question. Partially correct answers often did not include all the steps in the process. Candidates often confused the roles of DNA polymerase and restriction enzymes. They often confused the term vector with the host cells and the terms were used interchangeably. cDNA was rarely mentioned in answers. Several candidates described how the vector is to be introduced into the host cell; but the question did not ask for this information.

d. Most answers were correct or partially correct.

Question 6

a. The majority of candidates answered this question correctly.

b. Vast majority of candidates were incorrect and often suggested that molecule X was water. This could imply a misinterpretation of the arrow linking X to water on the diagram as a label leader line rather than an arrow summarizing a process.

c. Majority of candidates answered this question well.

d. Most answers were correct. Yet, some answers referred to chloroplasts rather than mitochondria.

e. Practically none of the candidates answered this question well, and often it was omitted. The release of electrons from reduced NAD and FAD was not linked to the electron transport chain.

f. Majority of answers were correct.

Section B

Question 7

a. Responses to part (a) on an ecosystem were in general poor. Several candidates listed biotic or abiotic factors and rarely both. Few candidates gave examples of biotic and abiotic factors.

b. Many candidates listed the progression of loss of energy from producers to secondary consumers. Less candidates gave detailed examples of how energy is lost from one trophic level to another.

c. Some candidates explained decomposers as saprotrophs. The majority of candidates failed to explain that decomposition is a metabolic process where energy is lost as heat.

d. i) There were several correct answers to this question.
ii) Answers to this part were mainly incomplete with few candidates listing nitrogen fixing as a beneficial process and denitrification as a harmful one.

Question 8

A large number of candidates attempted this question.

a. There were several correct descriptions of gaseous exchange and breathing.

b. Several diagrams were neat and labelled appropriately. However, in many accounts, the description of the passage of air to the alveoli lacked details of respiratory structures.

c. Several candidates gave the mechanism of inhalation and exhalation. Few described inhalation as an active process while exhalation as a passive one.

d. The majority of responses to this part were correct.

Question 9

a. i) The definition of a mutation of several candidates was poor.

ii) The majority of responses to this part lacked several details expected.

b. i) Several candidates gave at least two correct processes that bring about genetic variation.

ii) Several candidates used examples to describe variation and natural selection. Unfortunately, some candidates identified Lamark's theory of evolution, re stretching of necks of giraffes as the main theory bringing about natural selection.

iii) The majority of candidates got this part incorrect.

Question 10

a. Answers to this question were mainly correct.

b. The majority of candidates drew a correct structure of an amino acid but some forgot to label the relevant groups.

c. There were several correct responses to this question.

d. Some responses were incomplete lacking the required detail on fibrous and/or globular proteins.

e. Many descriptions of transcription and translation were mediocre lacking appropriated details of protein synthesis.

Question 11

Several candidates attempted this question.

a. The definition of a eukaryotic cell was mainly correct.

b. i) Several candidates drew a correct, well-labelled diagram of the plasma membrane.

ii) In several cases, candidates did not describe the phospholipid bilayer in enough detail.

c. In the majority of responses, candidates emphasised the double membrane organelles and did not mention, in their descriptions, single membrane organelles. Several candidates described the endosymbiotic theory correctly.

Chairperson

2018 Examination Panel