WAKISSHA JOINT MOCK EXAMINATIONS
MARKING GUIDE
Uganda Advanced Certificate of Education
UACE August 2023
BIOLOGY P530/1

SECTION A (40 Marks)

1.	C	11.	~~A~~ B	21.	C	31.	B
2.	~~D~~ C	12.	D	22.	A	32.	C
3.	B	13.	A	23.	C	33.	A
4.	A	14.	D	24.	C	34.	D
5.	A	15.	C	25.	C	35.	B
6.	A	16.	B	26.	B	36.	B
7.	A	17.	A	27.	D	37.	C
8.	C	18.	A	28.	D	38.	A
9.	C	19.	D	29.	D	39.	D
10.	D	20.	~~A~~ free	30.	B	40.	C

1 mark @ 40 x 1 = 40 marks
Sub-Total = 40 marks

SECTION B (60 Marks)

41. (a) Compensation point is that time of day where photosynthesis and respiration proceed at the same rate; and there is no net gain or loss in carbohydrate, CO_2 or O_2; (2 marks)

(b) Single CO_2 fixation occurs in mesophyll cells in C_3 plants; whereas C_4 plants have double CO_2 fixation both in mesophyll cells and bundle sheath cells; increasing the CO_2 concentration; consequently the photosynthetic rate; (04 marks)

(c) (i) 1 - Triose phosphate / 3 Carbon sugar / phospho glyceraldehyde / PGAL;
2 - Acetyl COA / A cetyl co enzyme A;
B - Krebs cycle; / citric acid cycle; / Tricarboxylic acid cycle;
Rej if spelling is wrong. (01½ marks)

(ii) The Krebs cycle is important in the synthesis of ATP; and hydrogen carrier molecules; like the NADH; and FADH; which will be feed into the Electron transport system; to generate more ATP molecules;
- Accept oxidative decarboxylation only if ATP production is mentioned; (2½ marks)

TOTAL = 10 MARKS

42. (a) (i) Is made of two polynucleotide chains; held together by hydrogen bonds through organic bases; and twisted along an axis to form a double helix; (3 marks)

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(ii) Parent DNA double helix separates into two polynucleotide strands; free DNA nucleotides pair with each other on the polynucleotide strands; forming two daughter double helices; into which one strand is exactly the same as that of the parent DNA molecule; (02 marks)

(b) % A = % T % C = % G let % of G = x
38 + 38 + x + x = 100%
76 + 2x = 100 ; working
2x = 24
x = 12 % of Guanine = 12% ;
If wrong working but correct answer, give one mark. (02 marks)

(c) Linked alleles tend to be passed from generation to generation as an inseparable unit; that they fail to assort independently during prophase II; denying genetic recombination of alleles / genes hence no variation; (03 marks)
On the same chromosome
- Reject crossing over alone;

TOTAL = 10 MARKS

43. (a) (i) After ripening period is the period allowed for mature viable dormant seeds to undergo physical and chemical changes; so as to be able to germinate; after harvest / shedding;
- Reject without after harvest 1 mark @ Total marks = 2

(ii)
- The activity of a number of enzymes rises especially catase, peroxidase, hydrolases;
- Protein digestion and level of soluble nitrogen compounds increases;
- The rate of respiration rises to increase the amount of ATP; and adenosine nucleotide;
- ~~Reverse~~ Reserved lipids are used up;
- The levels of gibberillic acid and cytokinin increases;
- The levels of abscissic acid and growth inhibitors decrease;

- Accept abbrevations. Any 4 4 x 1 = 04 marks

(b) The seeds have a light receptor pigment called phytochrome; that exists in two interconvertible forms ; PR and PFR when they receive light PR is converted into PFR; which promotes germination;
- Accept if correct figures given. (04 marks)

TOTAL = _____ MARKS

44. (a) (i) Sickle – cell haemoglobin differs from normal haemoglobin only in the sixth amino acid beta (β) chain; where as normal haemoglobin has glutamic acid; sickle cell haemoglobin has valine;
(02 marks)

(ii) Sickle – cell haemoglobin does not bind with O_2 very well, at low O_2 concentration it becomes deoxgynated; polymerises causing the red blood cells to become elongated and pointed at the ends;
(02 marks)

(iii) Symptoms
- Intense pain in muscles;
- Kidney & heart failure;
- Paralysis;
- Fatigue;
- General body weakness;
- Enlarged chest;

(01 marks)

(b) (i) Haemoglobin molecule consists of 4 protein chains called globins; 2 are alpha (∝) and 2 are beta (β) chains; each conjugated with a non-protein moiety called haem groups which bind O_2 to a ferrous ion; ~~Each haem group carries one oxygen molecule.~~

(03 marks)

(ii) When one haem group of the 4 combines with O_2, the result in a change in the conformation structure of the haemoglobin molecules; exposing the remaining 3 haem group the result is an increased affinity for these haem groups to combine with more O_2 molecules;

(02 marks)

TOTAL = 10 MARKS

45. (a) (i) Water potential is the average kinetic energy of water molecules in a system; while solute potential is the lowering of water potential due to presence of solute molecules in a system;

(02 marks)

(b) (i) Increases rapidly; ~~with increase in cell volume~~; from flaccid to frigidity;

03 marks

(ii) As pressure potential increases ~~with increase in relative cell volume~~; solute potential also increases;

02 marks

(c) As water potential rapidly increases, solute potential also increases; because the cell absorbs water by osmosis; thus there will be more water molecules than solute molecules; causing the solute potential to become less negative;

(04 marks)

TOTAL = 10 MARKS

46. (a) When a sensory neurone is stimulated by the arrival of a nerve impulse, it results into the movement of Sodium ions into the axoplasm and potassium ions out of the axoplasm; A point is reached when the outside becomes negatively charged and inside is positively; ~~this is called the~~ action potential.

(02 marks)

Is a wave of depolarisation that travels along an axon of an

(b)

Somatic	Autonomic
- Involves skeletal ~~muscels~~ muscles;	Involves glands, smooth muscles, cardiac muscle;
- One nerve fibre from CNS to effector;	Two nerve fibres involved;
- No ganglia;	Nerves synapse at ganglia;
- Neurotransmitter Acetylcholine (Ach)	Ach and norepinephrine (noradrenaline) (NE);
- Always excitatory;	Excitatory and inhibitory;
- Voluntary (consciousness	involuntary; (not conscious)

- spinal and cranial nerves involved
- less complex

any four

- sympathetic and parasympathetic nerves involved
- more complex

(.04 marks)

(c) (i) Parasympathetic nerves terminal ganglia is near or with in target organs which result into direct stimulation of the target organs; thus more selective; as compared to the sympathetic nerves whose ganglia are located further away from the target organs;

(02 marks)

(ii) Somatic nerves are thicker / big and are myelinated, the end result is faster conduction speed; whereas autonomic post ganglionic nerve fibres are thin / small and are unmyelinated thus low conduction speeds;

(02 marks)

TOTAL = 10 MARKS

END