***Proposed by**: hallanopong7@gmail.com*

ACEITEKA MOCK EXAMINATIONS 2024

UGANDA ADVANCED CERTIFICATE OF EDUCATION

BIOLOGY P530/1

SCORING GUIDE

SECTION A

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

SECTION B

41. (a);

Concentration of oxygen decreased rapidly; because of rapid increase in bacterial population; which rapidly consumed the oxygen in aerobic respiration.

Alternatively:

Oxygen concentration decreased rapidly; because of increase in turbidity of the water; reducing oxygen dissolution; and oxygen production by photosynthesis.

(b);

The concentrations of ammonia/ammonium and phosphate ions increased rapidly; due to rapid increase in bacterial population; which rapidly decomposed the sewage into ammonium and phosphate ions.

Alternatively:

Ammonia/ammonium and phosphate concentrations increased rapidly; because the sewage contains ammonium and phosphates

(c);

This is because the ammonium/ammonia released from the decomposition of sewage was converted into nitrates; by action of nitrifying bacteria

(d);

The number of algae increases gradually; because the decomposition of sewage by bacteria reduces turbidity of water; increasing light penetration.

Alternatively:

The number of algae increases gradually; because of increase in concentrations of nitrate nutrients, oxygen and carbon dioxide concentration.

(e);

This is because the increase in oxygen concentration; becomes toxic for anaerobic bacteria leading to their death.

Alternatively:

This is due to stiff competition among bacterial population for limited food resources; as a result of decrease in amount of biodegradable food substances downstream.

42. (a);

To get rid of the excess water that gets into their body; due to the fact that their internal osmotic potential is greater that external osmotic potential; therefore, fresh water animals tend to gain water through osmotic influx across permeable surfaces.

(b) i);

This is because its internal osmotic potential is less than the external osmotic potential; this results into osmotic efflux of water from its body; hence dehydration of its tissues.

Alternatively:

This is because its internal body fluid is hypotonic to the sea water; which leads to osmotic efflux of water from its body; causing tissue dehydration.

ii);

Maia the spider crab is an osmoconformer (cannot carryout osmoregulation); with high internal osmotic potential; therefore, it gains water osmotically; lowering its osmotic potential; resulting to bursting of its cells.

iv);

This is because freshwater cray fish reabsorbs salts across the tubules that join the labyrinth with the bladder; hence removing only excess water in urine.

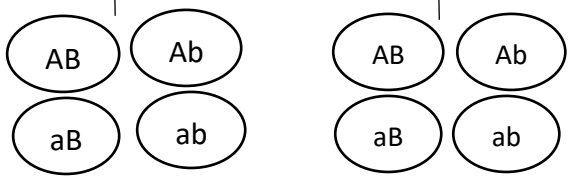
43;

Parental phenotype: Agouti x Agouti

Parental genotype (2n): AaBb AaBb

Meiosis

Gametes (n)



A Punnett square showing random fertilization

	AB	Ab	aB	ab
AB	AABB (Agouti)	AABb (Agouti)	AaBB (Agouti)	AaBb (Agouti)
Ab	AABb (Agouti)	AAbb (White)	AaBb (Agouti)	Aabb (White)
aB	AaBB (Agouti)	AaBb (Agouti)	aaBB (Black)	aaBb (Black)
ab	AaBb (Agouti)	Aabb (White)	aaBb (Black)	Aabb (White)

Offspring phenotypic ratio:

9 Agouti: 3 Black: 4 white

44. (a);

Kinesis;

Taxis;

(b);

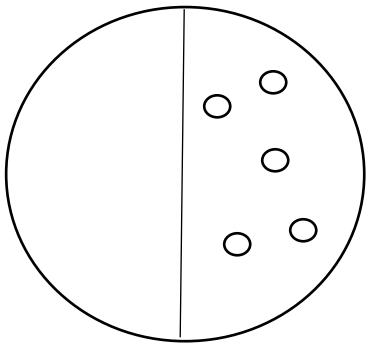
Orientation response involves movement of the entire organism whereas reflex action involves movement of a part of an organism;

Orientation response is more voluntary influenced by organism's experiences while reflex action is typically involuntary;

Orientation response is adjustable basing on experience whereas reflex action is fixed;

Orientation response is more complex whereas reflex action is simpler;

(c) i);



ii);

Taxis or Hydro taxis or Hydro tactic

(iii);

Non-learned behaviors are complex

Non-learned behaviors are inherited or inborn or innate

Non-learned behaviors are stereotyped or predictable

Non-learned behaviors are not flexible or adaptable

Non-learned behaviors are automatic

45. (a);

Differentiation refers to the specialization or modification of cells to carry out specific functions whereas development refers to the increase in the complexity of an organism during growth characterized by change in form and degree of complexity.

(b) i);

There is decrease in total dry weight; because of hydrolysis of stored starch into glucose; that was respired to release energy.

ii);

There is further decrease in total dry weight; because as the dry weight of stalks and leaves increased; more starch is used up during respiration; to meet the demands for energy by developing stalks and leaves.

iii);

As the dry weight of stalks and leaves increased; the total dry weight also increased; since leaves had sufficiently developed to carryout photosynthesis; resulting to production of more starch.

46. (a);

Period of depolarization is between 0ms to 1.8ms

Period of repolarization is between 1.8ms to 2.6ms

(b);

At 1.8ms, the inside of the axon is more positive; due to the opening of the sodium gated channels; leading to influx of sodium ions.

(c);

There is time delay of 0.6ms; which is the time taken for the neurotransmitter substance to diffuse from the presynaptic membrane; across the synaptic cleft.

(d);

Caffein increases the speed of synaptic transmission; because it is a stimulant; that increase rate of cell metabolism; resulting into release of more neurotransmitter substance.

...THE END...