**553/1 BIOLOGY**

1. Which of the following is the best reason for leaving a plant in a dark place for about 48 hours before carrying out experiments on photosynthesis ?To;
2. Stop the photosynthesis process in the leaf

D

1. Remove chlorophyll from the leaf
2. Keep it away from caterpillars which might eat it
3. Remove the starch from the leaf.
4. Which of the following statements are true for a person living at a higher altitude?
5. Breathes more slowly at a higher altitude
6. Breathes more quickly at a higher altitude

D

1. Stop the photosynthesis process in the leaf
2. Has comparatively fewer red blood cells
3. Has comparatively more red blood cells.

Which combinations are correct?

1. 1and 2 B.2and 3 C.1and 3 D.2 and 4
2. A man is stripped naked and put in a room at 200C for two hours. How does his body react to this prolonged exposure to this temperature?
3. His body temperature is lowered from 370Cto 200C
4. His body hours are raised and sweating continues.

C

C. He grows goose pimples, shivers and hairs raised.

D. Vasoconstriction occurs and loses a lot of heat.

1. The tip of bean root seeding was marked with ink at 2mm intervals. After several days it was noticed that some marks were longer apart than others. The explanation for this is that:
2. The cells have divided so rapidly where the marks are far apart.

C

1. The root was growing longer and longer.
2. Cells between some marks elongated more
3. Cells between some marks differentiated more.
4. A man steps in a dark room from a brightly lit one. What change must occur in his eyes so that he can see?
5. the pupils must become wider

A

1. Must light a candle to enable him see well
2. The pupils must become narrower
3. The lens must become longer.
4. When the trip of a maize celeoptile is covered with aluminium foil and illuminated from one side it doesn’t bend towards light .This is because:
5. The foil kills the auxin hormones
6. The tip did not receive the light stimulus

B

1. The hormones travel towards the zone of elongation
2. There is too much auxins at the trip.
3. 1and 2 B. 2, 3 and 4 C. 1, 2 and 4 D.2, 3 and 5
4. Which of the following are advantages of vegetative reproduction?
5. Growth is rapid in an established habitat

C

1. Desirable characteristics are maintained
2. Competitive growth for survival is intensive
3. Growth can occur even after destruction of foliage
4. Growth is slow at the beginning of rainy season.

A.1, 4 and 5 B. 2, 3 and 4 C.1, 2 and 4 D. 2, 3 and 5

1. What is the physiological advantage of the existence of the testis outside the body of mammals?
2. The scrotum is well protected by the thighs

D

1. The testes hang loosely with in the scrotum
2. Sperms swim actively in such environments
3. Sperms develop better below 370C.
4. The following are products of tissue respiration:

1- Energy 2- water 3- carbon dioxide 4-ethanol 5-lactic acid

Which of the above is common to both aerobic and anaerobic respiration in plants?

B

1. 1and 2 B.1 and 3 C.1, 2 and 3 D. 2, 4 and 5
2. The reason why the urine of a healthy person does not contain glucose is that;
3. Glucose is reabsorbed back into the blood stream
4. Glucose is used up during tissue respiration

A

1. The glomerulus is impermeable to glucose
2. The kidney and liver converts glucose to glycogen.
3. Which of the following is the correct response to increased carbon dioxide concentration in the human blood? The rate of;

C

1. Breathing is slowed down
2. Heart beat rate is slowed down
3. Heart beat is increased
4. Breathing rate does not change
5. Which of the following characteristics of a respiratory surface is true of humans but not of insects?

A. Highly vascularised B. Large surface area

A

C. Moist lining D. Thin walled

1. Where in the mammalian skeleton is the pivot joint found?

C

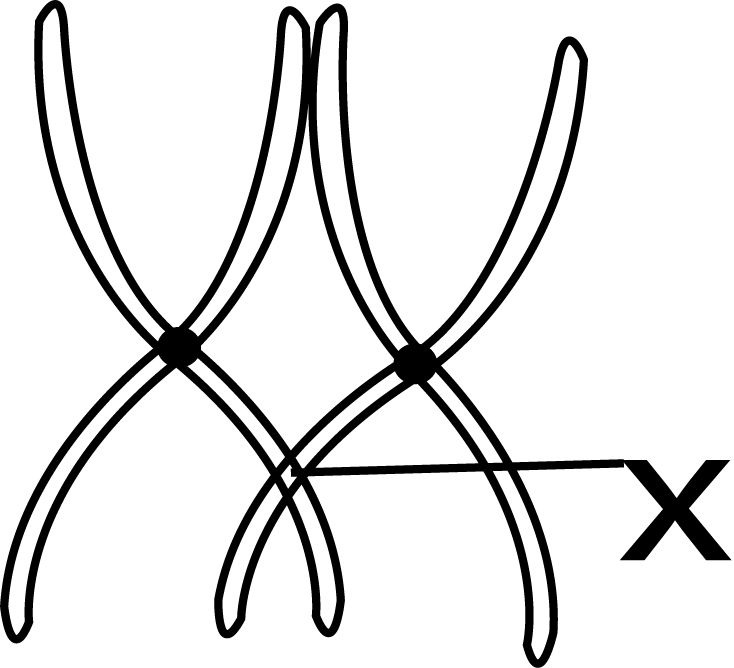
1. At the wrist and ankle. B. At shoulder and hip

C. Between axis and atlas D. Between lumber and thoracic vertebrae

1. Which of the following best explains the fact that plants don’t grow well in water logged soils?
2. The essential elements are easily leached

B

1. There is very little gaseous exchange
2. Water balance in the plant is upset
3. The plant fails to develop proper roots
4. The figure below shows early prophase 1



The part labelled x is called ………

1. Bivalent

B

1. Chiasmata
2. Centromere
3. Chromatid station
4. Which of the following features of viruses make them very difficult to be classified as living? They:
5. Can be made into crystals

A

1. Are not destroyed by drugs
2. Are not made of cells
3. Cause disease which have no cure.
4. 80g of soil was heated to a constant mass of 60g in an event at 1000C. What is the percentage of water in the soil sample?
5. 755

C

1. 48%
2. 25%
3. 10%
4. Green plants produce less carbon dioxide during the day because:
5. Most stomata close during strong light and heat

D

1. Transpiration interfere with carbon dioxide evolution
2. The rate of transpiration is low during the day
3. Some of the carbon dioxide is used by photosynthesis
4. Lack of nucleus in the red blood cells is an advantage in that it;

B

1. Enables the cell to pass through capillaries
2. Allows the cell to carry a lot of oxygen
3. Allows the cell to carry a lot of food
4. Enables the cell to engulf germs easily
5. Which of the following is the best way a swamp could be better utilized?
6. Reclaiming to establish dairy farms

B

1. Carry out fish farming and for raw materials
2. Planting eucalyptus to prevent flooding
3. Growing yams and rice to combat famine
4. If energy from the sum was cut off from the ecosystem containing the following organisms;
5. Carnivores
6. Saprophytes
7. Herbivores
8. Green plants

In which order would the organisms die out?

D

1. 1, 2, 3and 4
2. 2, 1, 4 and 3
3. 3, 1, 2 and 4
4. 4, 3, 1 and 2
5. Why is dry weight the best method of estimating growth in seedling? Because it:
6. Is easier to determine

C

1. Involves killing the organism
2. Gives the actual weight of the protoplasm
3. Not influenced by environment factors
4. Which of the mammals below is most likely to be a carnivore of desert area?

|  |  |  |  |
| --- | --- | --- | --- |
| Animal | Conc. of urea | Relative length of intestines | Period of greatest activity  B |
| A | High | Long | Night |
| B | High | Short | Night |
| C | High | Short | Day |
| D | Low | Short | Night |

1. The lymph fluid is slightly different from the blood plasma in that it contains :

|  |  |  |  |
| --- | --- | --- | --- |
| **Animal** | **Proteins** | **Other nutrients** | **Waste products** |
| A | Less | Less | More  A |
| B | Less | More | More |
| C | More | Less | Less |
| D | Less | Less | Less |

1. A grasshopper whose head is completely immersed in water for one hour may not die because;

A

1. The spiracles are still in position to function
2. Grasshoppers don’t drink water
3. Water contains nutrients on which they feed
4. It can hold its breath even longer
5. What would happen to a plant if it lost its cuticle from the leaves through pollution?
6. It would absorb too much sunlight

D

1. Too much oxygen would be absorbed
2. Chlorophyll would leak out of the leaves
3. The plant would lose water more rapidly
4. When a white flowered plant is crossed with red flowered plant, pink flowered plants are produced. Which of the following would be the phenotypic ratio of the F2 when the off springs are selected?
5. 1 red : 1 pink : 1 white

D

1. 2 red : 1 pink : 1 white
2. 1 red : 1 pink : 2 white
3. 1 red : 2 pink : 1 white
4. Below is a food chain

Algae mosquito larvae small fish large fish crocodile

Which of the following would help in the reduction in the number of mosquito larvae?

1. Increased in the number of algae
2. Increase in the number of large fish

C

1. Increase in the number of crocodiles
2. Decrease in the number of small fish.

A

1. Babies need to feed almost continuously because they have;

|  |  |  |
| --- | --- | --- |
|  | **Surface area to volume ratio** | **Heat loss** |
| A | High | Rapid |
| B | High | Low |
| C | Low | Rapid |
| D | Low | Low |

B

1. Which of the following is **NOT** true of mutation?
2. Many affect only one gene.
3. All produce harmful effects.
4. Can be inherited.
5. Are raw materials for evolution..

**SECTION B:**

1. A student tied strips of dry cobalt chloride paper on the lower and upper surfaces of a leaf pressed between dry glass slides. It was used to investigate the time taken for the strips to turn from blue to pink. The experiment was performed five times. The results are shown in the table below:

|  |  |  |
| --- | --- | --- |
| **Time in minutes taken for the paper to turn pink** | | |
| **Experiment** | **Upper surface** | **Lower surface** |
| 1 | 10 | 3 |
| 2 | 13 | 4 |
| 3 | 4 | 3 |
| 4 | 11 | 4 |
| 5 | 12 | 3 |

1. What biological process was being investigated in the above experiment? (1 mark)

Transpiration

1. State the most likely conclusion that can be drawn from the results of experiment

1, 2, 4 and 5. (1 mark)

Shows that more, Transpiration occurs on the lower surface,

(c) Suggest explanations for the results of these experiments.

1. Upper surface of the leaf: Upper surface/epidermis has auticle, which is water proof, this minimizes water 108,

-Few stomata/no stomata found here, hence transpiration (5 marks)

**(ii) Lower surface of the leaf. (2 marks)**

Lower epidermis has more stomata, causes more transpiration which turns COCl2 paper to

Pink.

(d)Suggest two possible reasons for the results obtained for the upper epidermis in experiment 3. (2 marks)

Leaf surface might have not been properly dried

- could be due to damaged veins/xylens in the leaf

(e) Suggest how the student may improve on the reliability of this experiment. ( 2 marks)

Should upeat the experiment several times, and forke the average of the time taken

(f) Suggest how the experiment could show that the amount of water vapour coming

             from the leaf is greater than that in the atmosphere. (3 marks)

Place the COCI2 paper on the bench and note time taken to change when; if atmospheric humidity is greater; then it will take leaser time to change in colour.

(g) Suggest with reasons, how the time taken to change the paper from blue to pink would

                vary when;

(i) The temperature of the surrounding is increased. (2 marks)

Time taken would be shorter; because at higher temp more water is changed into vapour at a faster rate

(ii) The light intensity is increased. (3 marks)

at higher intensity more stomata are open; hence more water vapour escape; time taken would decrease/takes a shorter time;

1. The table below gives some information about some plants after they had been grown in different soils for 12 weeks. The plants are of the same species.

|  |  |  |
| --- | --- | --- |
| **Features** | **Plant G** | **Plant H** |
| Height(cm) | 30 | 23 |
| Number of leaves | 26 | 17 |
| Appearance of new leaves | Large and dark green | Small and yellow |
| Condition of root system | Well developed | Poorly developed |

1. Which of the plants was growing in soil lacking mineral ions? (1 mark)

Plant H

1. State 3 ways in which the above plant differs from the normal one. (1 marks)

- It is shorter than PH G

- Has fewer no of leaves

- Has yellowish leaves;

(b) State two mineral ions which are lacking from the soil in which the plant was grown. Explain your answer. (3 marks)

Nitrate; because growth in H in height, no of leaves and not system is reduced, indicating absence of nitrates for protein synthesis, to make new cells.

Mg2+ions; because leaves of H are yellowish as they lack xphyll, indicating absence of Mg+ phxphyll synthesis.

(c) How would the soil deficient in such minerals be improved? (1 mark)

By application of those minerals in fertilizers

1. (i) Name the substance missing in plant H after 12 weeks. (1 mark)

Chlorophyll

(ii)How would the above missing substance affect the yield of the crop plant? (2 marks)

The yield would be low done to low rates of Ph hence not much new materials would be synthesized.

1. Three different plants from the same species have different leaf shapes. Plant D has spear-shaped leaves E has round leaves and plant F has oval leaves. Plant D and E are homozygous for leaf shape and plant F is heterozygous. The leaf shape is controlled by two alleles.
2. State the phenotype of the heterozygous plant. (1 mark)

Oval shaped tense plant

1. (i) Construct a genetic diagram to show how a particular cross will always result in all

off-springs having a different phenotype from both parents. (4 marks)

Let A has represent the allele for round shaped level;

B represents the allele for spear shaped leaves

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(ii)Suggest the explanation for the above. (3 marks)

Allele A and B are

A Combination of A and B alleles will result into a phenotype intermediate showing the two i.e. oval leaves

1. In some cases when two plants shown above are crossed, the offspring produced had three different leaf shapes in the 1:2:1, construct a genetic diagram to show how this happens.

C:\Users\UMTA\Desktop\hfgddhfhj.wmfRound leaves X oval leaves (3 marks)

**SECTION C:**

**Attempt any two questions from this Section.**

1. (a) State the differences between tropic and nastic responses in plants. (5 marks)

* Tropic responses - Nastic responses
* Is a growth response - is not a growth response
* Unidirectional stimulus - non-directional structures

Directional response - non-directional response

* Slow and permanent response - response rapid and often temporary
* Influenced by hormones - not influenced by hormones

(b)A wrestler faces a very aggressive opponent in a hotly contested fight. Explain the physiological changes that occur in his body to prepare him for the fight. (10 marks)

Higher rays from the opponent focused onto the vetina; Impulses sent to the brain for interpretation; produces ACTN, hormones to the adrenal gland; adrenaline hormone produced; increases cardiac output and frequency; arteries to the muscles dilate; more blood to the muscles to convey more glucose and O2; also to remove the CO2; also to remove the CO2 produced; liver convert stored glycogen to glucose; metabolic rate increases; to supply more energy; breathing rate increases to supply more O2 and remove CO2.

Other effects of adrenaline

* Erection of the hair/goose pimples
* Increased mental awareness
* Diversion of blood from surface to the essential organ
* Elevation of the sphincter muscles
* Elevation of gastro-intestinal smooth muscles.

1. (a)Describe how fish is adapted for locomotion in water. (10 marks)

– Have a structured body to reduce resistance

* Scales overlap pointing backwards to minimize friction
* Have bladder to make them
* Paired fins (pelvic and pectoral) to control pitching and breaking
* Long caudal fin and muscular for forward thrust and steering
* Muscle blodes for side to side lasting of ovules
* Loosely held vert-column for flexibility.

(b)Giving specific examples explain how support in plants is accomplished. (5 marks)

Support in plants

* Larger pressure due to water absorption keeps cells from
* Collenchgman and sclemchgma closely packed for support
* Inelastic cuticle in epidermis helps shape in plants;
* Xylem and Tracheids the liquefied for support;
* Climbing plants obtain mechanical support from other objects by having hooks, tendrils;

1. (a) Explain why it is important to control the internal environment of the body. (3marks)

Chemicals reactions in the body involve enzymes; which work at optimum conditions; which must be kept constant;

(b)Describe how the level of each of the following is regulated in the body:

(i) Glucose level in the blood.

* When the blood glucose level increases; the pancreas secrete hormone; which causes the liver cells to convert the excess glucose to glycogen; or fats; for storage; or respired to lower the high levels to normal;
* When the blood glucose level is lower than normal; the pancreas secrete glucagon hormone; which causes the conversion of shined glycogen to glucose by the line cells; to increase the blood glucose level;
* Glucagon also causes the conversion of amino acids and fats into glucose;

1. Amino acid level in the body.

Amino acids are not stored; excess are denominated in the liver; producing Urea; for execution; by the kidney; the carbon residue is converted into carbohydrates; for respiration;

37. (a) State what is meant by parasitism. (2 marks)

Is the association between 2 organisms in which one organism the parasite gets food from; and caused h to the other(host)

(b) What are the dangers of a parasitic mode of life? (5 marks)

Dangers of parasitic mode of life

* Failing to find the right host;
* Failing to penetrate the host;
* Monitoring its position/being dislodged;
* Being destroyed by the host
* Being extinct/eliminated /killing the host and eventually itself being killed.

(c) Explain why *Schistosoma* is a successful parasite. (8 marks)

* It has 2 hosts enhancing its survival;
* Has the ability to penetrate the hormone skin,
* Can tolerate low 02 cm in host’s tissues;
* Has suckers for attachment to avoid being dislodged;
* The parasite reproduces by larval forms (cerceria and miracides) in snails, making it difficult to eradicate;
* It lays many eggs to enhance its survival chances;
* Adult worms secrete chemicals which items from the hosts defense mechanism
* Always found in pairs (male and female) to ensure high reproductive rate;

**END**