1. Viruses ;
2. ***Fruits/ a part of the fruit is, fleshy/ juicy/ succulent (Fruits/ a part of the fruit is brightly coloured. Fruits large-sized and thus conspicuous (acc. Clustered rej conspicuous alone) fruits scented/ with a sweet smell/ aroma; seeds have tough/ hard/ slimy testa; (ej coat alone for testa, Accept seed coat for testa) seeds covered with sticky/ mucoid/ slimy materials (the fruit/ parts of the fruit) have hooks/ hook-like structures (mark the first floor (1 mk x 2= 2 mks)***
3. Irritability

* ***Ability of a living thing/ organism to detect/ perceive and react to a change in its environment (note both/ the two underlined aspects of the phenomenon must be stated to score 1 mk)***

1. seed dormancy

* ***Inability of seed of a given plant to germinate (caused by conditions within the seed) in a specified period of time. Under environmental factors/ conditions that are normally suitable/ ideal o germination (of the non-dormant seed) (Note: both aspects of seed dormancy must be specified to score 1mk)***

1. Double fertilization

* ***One of the male nuclei fuses with the egg cell nucleus to form diploid zygote while the other male nucleus fuses with the polar nucleus to form triploid primary endosperm***

1. a ) Goitre

b) beriberi

5. increase surface area for attachment of respiratory enzymes hence increased rate of respiration

6.

|  |  |
| --- | --- |
| ***Transpiration*** | ***Guttation*** |
| ***Loss of water from a plant surface in from of water vapour*** | ***Loss of water from a plant surface in form of liquid droplets*** |
| ***Take place/ water is lost through stomata, lenticels, thin cuticle*** | ***Takes place/ water is lost though hydathodes;*** |

7. pepsin secreted as pepsinogen

Trypsin secreted as trypsinogen

8. cilia waft to propel the ovum in the fallopian tube

9 a) carotid artery

b) coronary artery

10. Has contractile vacuoles that collect and discharge excess water out of the cell

1. a)Name taxonomic class of woodlice

* ***(class) Crustacea (NB initial ‘C’ must be written in upper case while others in small letters***

b) Name two other organisms in the taxonomic class in (a) (i) above

* ***Crab/ lobster/ catfish, Bamades, Krill***

c) State two features characteristics/ diagnostic o organisms in the taxonomic class in (a) (i) above

* ***Bitamoua (two pated) appendices; two body [parts; cephalothorax covered dorsally with carapace/ hard shell like structure, two pairs of antennae; Chitinous exoskeleton/ segmented body (paired and )jointed appendages/ each body segment with a pair of appendages/ dorsal, tubuler heart/ open circulatory system/ internal body cavity a haemocoel through which haemolymph circulates and in which internal body organs suspended/ vision by means of compound and simple eyes/ Excretion by means of malphigian tubules.***

1. a) Suggest a suitable method used to mark the grasshopper

* ***Applying nail polish/ varnish, using permanent marker pen/ felt pen***

b) Calculate population density of grasshoppers in the field.

***Population size = first marked/ captured x second capture***

***Marked re-captured***

***= 100 x 80***

***40 = 200 grasshoppers***

***Population density = 200 grasshoppers***

***5km2***

***= 40 grasshoppers/km2***

1. ) Identify the cell

* ***Root hair***

ii) State 1 feature observable in the diagram above that adapts the cell to its function of absorption of water and mineral ions

* ***Has an elongated portion to increase surface area over which water and mineral ions are absorbed***

b) Name the part labeled F

* ***Sap vacuoles***

1. a) i) Identify type of neuron in the diagram above

* ***Motor/ Efferent neurone***

ii) Give one reason for your answer in (a) (i) above

* ***Cell body located at one end/ the edge of the cell***

b)Draw an arrow alongside diagram above to indicate direction of flow of nerve impulse in the neurone.



1. a) Where in the mammalian body does the reaction above take place?

* ***In red blood cells in the blood capillaries in the tissues with high carbon (IV) oxide concentration.***

b) Name enzyme X

* ***Carbonic anhydrase/***

1. a) Name the part labeled P

* ***Acrosome***

b) Give one adaptive feature of the nucleus – the organelle T.

* ***Carried haploid/ half the normal number of chromosomes of the species; so that following fertilization, the normal diploid condition of the species is reconstituted; rej. Contains the nucleus synthesis of ribosomes; rej. Semipermeable membrane for selective movement of materials between the nucleoplasm and the rest of the cell (NB- the core function of the nucleus in the sperm cell is reproduction. The latter are auxiliary roles of the organelle.***

c) State function of Flagellum/ tail – pat Q

* ***Forward- Propulsion of the cell.***

1. a)Why is it necessary to remove carbon (IV) oxide

* ***Confirm that any carbon (IV) oxide present/ detected is from the animal and not from the incoming air.***

b) Calcium hydroxide solution is put in the jars labeled 2 and 3, explain why

* ***Jar 2 – to confirm that the incoming air is Carbon (IV) oxide – free***
* ***Jar 3 – to test for Carbon (IV) oxide in the air exhaled by the small animal.***

c) Suggest suitable control for this experiment

* ***Same set up but without/ excluding the animal***

1. a) i) Name the physiological process illustrated above

* ***Diffusion, rej. Osmosis***

ii) Give two examples of applicability of the process named in (a) (I above in plants

* ***Gaseous exchange/ Taking in of oxygen and excretion of carbon IV) oxide***
* ***Translocation of materials (in phloem tissue***
* ***Absorption/ uptake of mineral ions/ salts***

b) State 2 ways by which movement of the dye molecules would be slowed down.

* ***Lowering the temperature of the medium***
* ***Increasing thickness of the membrane (to increase the diffusion distance***
* ***Use a smaller quantity of the dye***
* ***Add more water to reduce the concentration gradient.***

1. a) i) What was being investigated in the experiment?

* ***Positive – hydrotaxis in ants/ Response of ants to water.***

ii) Explain your answer in (a) (i) above

* ***Ants moved into the flask containing (cotton wool soaked in) water; to be able to obtain water for their metabolism. No ants moved into the dry flask.***

b) What was the role of flask II in the experiment?

* ***Serve as a control.***

1. Outline 2adaptive features of guard cells

* ***Inner/ proximal/ventral wall in thicker and thus less elastic than the outer/ distal/ dorsal wall; the converse- the outer/distal/dorsal wall is thinner and thus elastic than the inner/ proximal/ ventral wall) and thus when the cells are turgid, the outer wall stretches more while the inner wall resist enlargement making the cells burg outwards leaving a pore-stoma in between.***
* ***Contain chloroplasts and thus carry out photosynthesis; forming glucose (an osmotically active chemical substance) which increases osmotic pressure of the guard cells, water molecules them move into the cells by osmosis (resulting into opening of the stomatal pore.***

1. a) The scientific name of the European wildcat

* ***Felis silvestris***

b) The species/ specific name/ epithet of the European wildcat

* ***silvestris; NB: all letters in this word must be lower case, to score.***

1. ***A) secretin b) cholecystokinin***
2. Identify type o gene mutation represented in each case

* ***I – Deletion (of gene ‘e’)***
* ***II – Substitution/ inversion***

1. Define omnivores

* ***Animals that acquire energy and nutrients from materials of plant and animal origin. Omnivores are strictly animals.***

b) Name two animals that are omnivores

***Man (rej men) human/ human being/, bear, hedge dog, skunk, squirrel, Raccoon, mouse, rat. Chimpazee, orangutan, Armadilo, Monkey (Accept the plural’s/ humans beings, pigs, badgers etc)***

1. a) Give the term used to describe this phenomenon

* ***Codominance (written as one word)***

b) Give one example of a trait in human beings where the condition whose term is named in (a) above express itself.

* ***Type AB blood group/ type, rej blood group/s alone, rej ABO blood group/s acc. Sickle cell trait rej. Sickle cell disease/ sickle cell anaemia.***

1. State 2 normal morphological/ physical features of the mammalian red blood cell represented in the diagram above

* ***Biconcave***
* ***Lacks nucleus/ anucletae***

1. Ai) rate of transpiration is higher in windy than in still air condition

ii) wind blows off water vapour from the surface of the leaf ;thus raising the saturation deficit hence increasing rate of transpiration;

b) widened stomatal aperture increases the surface area for transpiration

1. A) increase in oxygen concentration results in corresponding increase in amount of sugar loss and potassium gain; oxygen gas is used to oxidize the sugar during respiration to generate energy needed for active uptake of potassium ions;

b) introducing enzyme inhibitors;

reducing/eliminating oxygen gas and sugar;

1. a) Identify the tissue labeled K

* ***Palisade/ mesophyll (tissue)***

b) Name the response (to sunlight) sown by the chloroplasts in diagram I

* ***Positive phototaxis/ positive phototactic response rej. Phototaxis alone, rej positive phototropism.***

1. Outline importance of the orientation of the chloroplasts as illustrated in diagram II i.e why do chloroplasts move away from bright sunlight?

* ***Chloroplasts move away from bright/high-intensity sunlight (at 2pm) to avoid solarisation / destruction/ photo –oxidation) of chlorophyll (molecules) by high – intensity/ very bright sunlight.***