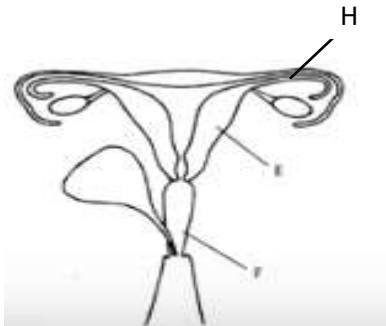


1. Name the disease caused by the following microorganisms
 - (a) *Entamoeba histolytica* (1mark)
 - Amoebic dysentery
 - (b) *Plasmodium Ovale* (1mark)
 - Malaria
2. (a) State two sites in animal where counter current flow of fluids occurs (2 marks)
 - Kidney tubules/nephrons
 - Gills of bony fish
 - Placenta
 (c) Explain the significance of the counter current flow system in living organisms
 - To maintain a steep concentration gradient for efficient and faster exchange of materials
 -
3. The following diagram represents parts of the female reproductive system



- (a) Identify the part labeled F (1mk)
 - F-vagina
 - (b) Explain the structural adaptation of the part labeled E to its function (2marks)
 - Lined with thick muscles/muscular to allow for expansion for accommodating foetus and to allow for contraction during child birth
 - (c) Use letter H to label on the diagram the part where ectopic pregnancy is likely to occur
4. The following diagram represents a skull of a certain mammal.



- (a) state the likely mode of nutrition for the animal from which skull was obtained (1 mark)
 - carnivorous
- (b) Explain your answer in 4a.
 - Long pointed, canines for grasping / tearing/ripping flesh
 - Presence of cusps on molars/premolars for crushing bones
 - Sharp incisors for nipping/cutting flesh

5. Students observed the smell from a decomposing animal carcass was stronger at the mid-day than early in the morning

(a) Name the physiological process by which the smell reached the students (1mark)

- *Diffusion*

(c) account for the observation made by the students (2marks)

- *Temperatures are higher at midday which increase the rate of diffusion / movement of air molecules from the decomposing carcass where they are highly concentrated*

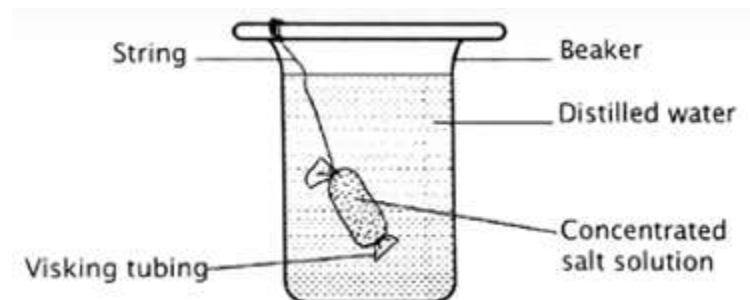
6. State two ways in which sweating is significant to human body

- *Thermoregulation / body temperature regulation*
- *Excretion / Elimination of wastes / urea / water*

7. State three characteristics of the Kingdom Monera that are not found in the Kingdom Animalia (3 marks)

- *They are prokaryotic / lack nuclear membrane*
- *They lack membrane-bound organelles*
- *Possess cell walls*
- *They are unicellular*

8. The diagram illustrates a set up to investigate a certain physiological process. The set up was left undisturbed for 10 mins.



(a) Name the physiological process under investigation

- *Osmosis*

(b) State the observation made after 10 mins

- *The level of water in the beaker dropped*

- The visking tubing expanded / swelled more

(c) Account for the observation made in 8(b)

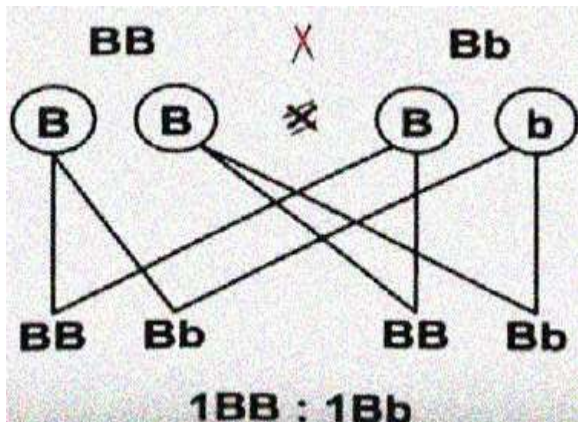
- *The water in the beaker is hypotonic to the salt solution the visking tubing so water moved across the semipermeable membrane into the visking making to swell hence reducing the level of water in the beaker*

9. in a genetics study, a pure breeding black bull was crossed with a pure breeding white heifer. All the offsprings were black.

(a) Account for the black colour phenotype in all the offsprings

- *The gene for black colour coat was dominant over the gene for white colour coat*

(b) Work out the genotypic ratio of the offsprings if the pure breeding black bull was crossed with a female heterogeous for colour (5 marks)

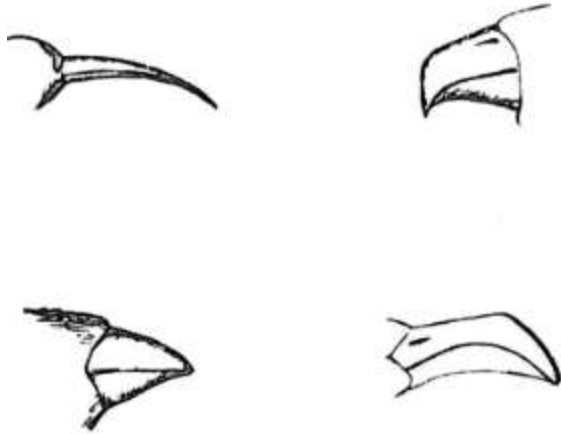


10. Account for the following observations;

(a) When the pancreatic duct of a mammal is blocked, blood sugar regulation remains normal while digestion is impaired (2 marks)

(b) Most desert animals have longer loops of henle (3 marks)

11. The following diagrams represent beaks of different birds



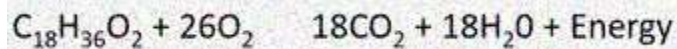
(a) State the type of evolution illustrated by the diagrams

- *Divergent evolution*

(b) Explain the significance of the type of evolution stated in 11(a) above

- *The different beaks of the birds enables them to exploit different ecological niches thus reduces competition for food*

12. the following equation represent a certain metabolic reaction taking place in animal cells



(a) Name the organelle where the reaction occurs

- *Mitochondrion*

(b) (i) calculate the respiratory quotient of the substrate being oxidized

$$\begin{aligned}
 RQ &= \frac{\text{Volume of } CO_2 \text{ produced}}{\text{Volume of } O_2 \text{ used}}; \\
 &= \frac{18}{26} \\
 &= 0.6923; \quad \text{acc. Minimum upto 2 decimal places} \\
 &\quad \text{Res. 0.7}
 \end{aligned}$$

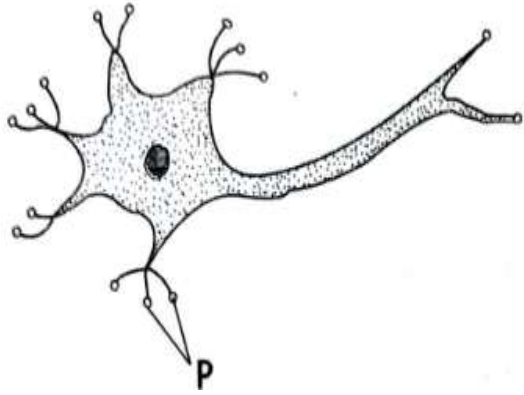
(ii) Identify the substrate being oxidized in the reaction

- *Fats/Lipids/Oils*

(c) State two factors other than oxygen concentration that that affect the rate of the illustrated reaction

- *Optimum temperature for enzyme action*
- *Substrate concentration*
- *Favourable pH*
- *Age/Activity of the organism*

13. The following diagram illustrates a neurone



(a) (i) Identify the neurone

- Relay neurone

(ii) Give a reason for your answer in 13 (a)(i)

- Lacks myelin sheath
- Lacks schwann cell

(b) (i) Name the part labeled P on the diagram

- Dendrites

(ii) State the function of the part named in 13(b)(i)

- Transmit impulses to the next motor neurone

14. In an experiment students added some water to a beaker containing maize flour and yeast . the beaker was covered and left on the laboratory bench undisturbed for three days

(a) State the aim of the experiment

- *To demonstrate anaerobic respiration/fermentation*

(b) State two observations made by the students after three days

- *The beaker content had increased temperature*
- *Frothing/swelling of the contents in the beaker*
- *Alcoholic smell*

15. (a) State two characteristics observed in a 25-year old male incapable of producing testosterone home

- Shallow voice
- Less hair growth in pubic regions and facial hair
- Less hairy chest/chin/armpits/body
- Lack sexual attraction to ladies
- Less muscular
- Small testes
- Failure to produce sperm

(b) Name one part in plants where auxins are produced

- Apical buds /shoot apex/apical meristem
- Shoot tips
- Root tips

16. (a) Name the branch of biology that deals with the study of insects

- Entomology

(b) Name one piece of apparatus that one would use to collect insects for study

- Pooter
- Sweep net
- Specimen bottle
- Pitfall trap
- Bait trap

17 (a) Distinguish between resolution and magnification as used in microscopy

- Magnification – ability of a microscope to enlarge a smaller object to desired size for clarity/ease of study
- Resolution – refers to the ability distinguish between finer details

(b)state the significance of the following procedures during the preparation of wet mounts of plants tissues:

(i) Staining (1mark)

- Enhances clarity of object / specimen details

(ii) Making thin sections (1 mark)

- Reducing the layers of cells to make it transparent in order to allow maximum penetration of light

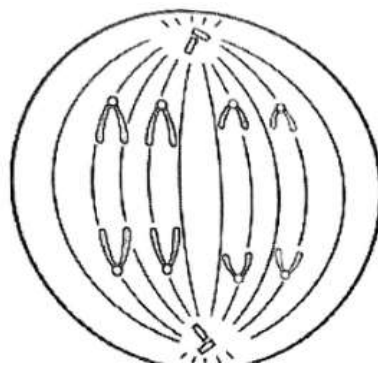
18 (a) state two means through which plants eliminate excess water (2 marks)

- Transpiration
- Guttation

(b)Explain the significance of hair on the human skin during cold weather (3marks)

-

19. the following diagram represents a stage in the mitotic division of a cell



(a) (i) Identify the stage of mitosis illustrated

- Anaphase

(ii) Give a reason for your answer in 19(a)(i)

- Chromatids are moving towards the poles
- Chromatids have separated

(b) The role of the centrioles in cell division (1 marks)

- Formation of spindle fibres

20. State the significance of each of the following characteristics of living things

(a) Irritability

- to escape danger and adjust to harsh environmental conditions
- Enables organism to seek favourable conditions
- Enables organism escape unfavorable conditions in order to survive
-

(b) Reproduction

- For procreation/to prevent extinction of organisms
- Guarantees continuity of species / transmission perpetuation desirable qualities or traits to the subsequent generation or offspring

21. The following diagram represents a mammalian tooth



(a) Explain the structural adaptation of the tooth to its function (2 marks)

- Has cusps to facilitate crushing of food
- Has flat/broad surface to provide an area for grinding of food

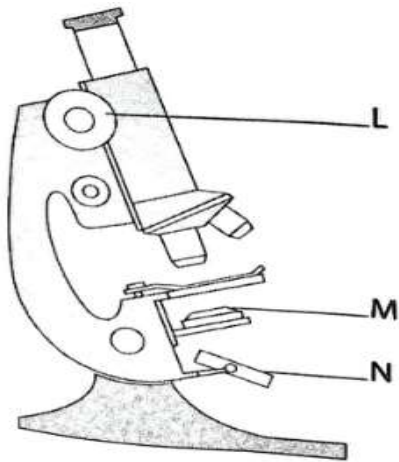
(b) How does drinking cold water immediately after a meal affect digestion?

- Cold water lowers the temperature of the gut, inactivating enzymes which slows digestion

22. Explain the concept of natural selection among organisms in relation to an ecosystem with insufficient food (2marks)

- *There will be competition for food*
- *The unfit individuals will lack food get eliminated through death*
- *The fit individual with characteristics that favour competition will consume the available food and survive to maturity to reproduce fit individuals*

23. The diagram represents a light microscope



(a) Name the part labeled N (1mk)

- Mirror

(b) State the functions of the parts labeled L and M

L: Course focus

- move the body tube for rough focusing or positioning of the specimen

M: Condenser

- concentrates light on the stage or object or specimen