MARKING SCHEME

1. (a) Define the term 'photosynthesis'. (1 mark)

Process by which green plants manufacture their food using simple substances in presence of sunlight

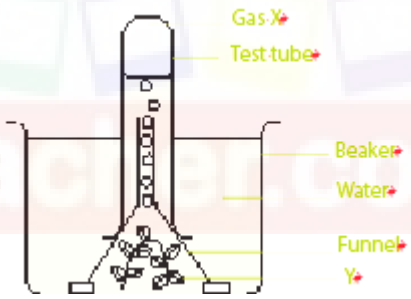
(b) State four requirements for the process of photosynthesis. (4 marks)

- **Water**
- **Carbon (IV) oxide.**
- **Presence of sunlight energy**
- **Chlorophyll**

2. Name the branch of biology that deals with the study of: (3 marks)

a) Cells- Cytology
b) Parasites-Parasitology
c) Viruses-Virology

3. The diagram below shows an experiment that was set up to investigate a certain process.



The set-up was left in bright sunlight for several hours.

(a) State the aim of the experiment. (1 mark)

To test if Oxygen gas is produced during photosynthesis

(b) Name X and Y. (2 marks)

X-Oxygen gas

Y- Water plant

(c) Other than sunlight, name three other factors that would affect the experiment. (3 marks)

Carbon (iv) oxide concentration
Temperature

Water

(d) State how the identity of X would be confirmed. (1 mark)

Using a glowing splint

(e) Write a chemical equation for this process. (3 marks)

$6H_2O+6CO_2$----------$>C_6H_{12}O_6+6O_2$

Water + Carbon (IV) oxide ---------- Glucose + Oxygen.

4. Draw a well labelled diagram of a simple leaf (5mks)

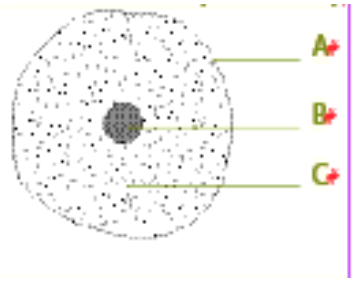
- **MARK THE USE OF ALL RULES OF BIOLOGICAL DRAWINGS**

5. Tabulate the differences between plant and animal cells. (4 marks)

PLANT CELL- ANIMAL CELL

- **Plant cell Animal cell -Usually large Smaller in size**
- **Regular in shape- Irregular in shape**
- **Has a cell wall -Has no cell wall**
- **Usually has a large central vacuole -Usually has no vacuoles but when present, they are often temporary and small structures within the cytoplasm**
- **Cytoplasm and nucleus are usually located towards the periphery of the cell- Cytoplasm occupies most space in the cell with the nucleus usually centrally placed**
- **Some have chloroplasts -Has no chloroplasts**
- **Usually more store oils, starch and proteins- Store glycogen and fats**
- **Has no centriole- Has centriole**

6. The diagram alongside was drawn by a student after observing a human cheek cell under a microscope.



(a) Suggest the type of microscope the student used. Give a reason. (2 marks)

Light microscope: only fewer details of the cell could be seen

(b) Name the parts labelled A, B and C. (3 marks)

A-Cell membrane

B- Nucleus

C-Cytoplasm

(c) State the functions of parts A, B and C. (3 marks)

A-Allow selective movement of materials in and out of the cell

B- Controls all activities of the cell

C- Fluid in which all organelles are suspended

(d) State two features which make this cell different from a plant cell. (2 marks)

Nucleus centrally placed

Lack cell wall

7. Differentiate between haemolysis and crenation (2marks)

Haemolysis is the process by which an animal cell gains water by osmosis, becomes turgid and finally bursts when placed in a hypotonic solution while Crenation is the process by which an animal cell loses water and shrinks when placed in a hypertonic solution

8. Define the term species (1mark)

Smallest unit of classification whose members freely interbreed to produce a fertile offspring

9. State the functions of the following parts of a microscope (2marks)

a) Condenser

Concentrates light onto the object on the stage

b) Diaphragm

Regulates the amount of light passing through the condenser to illuminate the specimen

10. List four factors affecting diffusion (4marks)

- **Diffusion gradient**
- **Surface area to volume ratio**
- **Thickness of membranes and tissues**
- **Size of molecules**
- **Temperature**

11. Name the apparatus used for trapping crawling organisms (1mark)

Pit fall trap

12. A student counted 20 cells across a field of view whose diameter was 3mm. Calculate the size of one cell in micrometers (3marks)

Diameter of field of view/number of cells

3000/20=150 micrometers