NAME ……………………………………………………………………………ADM NO………………………………..DATE…………………………

BIOLOGY

FORM ONE

JULY/AUGUST 2015.

MWAKICAN JOINT EXAMINATION TEAM(MJET) 2015

BIOLOGY

FORM ONE

**Answer all the questions in the spaces provided(100mks)**

1. a.Name one product of the light stage during photosynthesis(1mk)

b.Name the process by which water molecules are split by light during photosynthesis (1mk)

1. What name is given to the process whereby :
2. Red blood cells wrinkle after losing their water to a hypertonic solution?(1mk)
3. Plant cells become flaccid after losing their water to a hypertonic solution?(1mk)
4. Four equal strips A,B,C and D were cut from a potato whose cells had a sugar concentration of 28.5%.The strips were placed in sugar solutions of different concentrations as follows:

A:10% B 15% C 25% D 35%

1. What changes would you expect in strips A and D?2mks
2. Account for the change in strip D(3mks)
3. The figure below shows a small piece of visking tubing which is filled with potassium permanganate solution. Its free ends were tied tightly to prevent leakage .It was then dipped in a beaker full of distilled water. The set up was left for 2 hours .Its was observed that the distilled water was coloured purple.



1. What physiological process was being investigated.(1mk)
2. Account for the observation made in (a) above.(3mks)
3. a.State three factors that affect enzyme activities.(3mks)

b.Name the structures on an enzyme where substrate molecules fix themselves during an enzyme reaction.(1mk)

c.State what would happen to an enzyme molecule if the temperature is:-

i. Raised above 40˚c(1mk)

ii.Lowered below 10˚c.(1mk)

1. The diagram below represents a set up that was used to investigate a certain process in a plant.



1. State the aim of the experiment.(1mk)
2. State a factor that would affect the process.(1mk)
3. State the importance of nucleic acids to an organisms.(1mk)
4. State the significance of the following to a leaf:-
5. Thinness(1mk)
6. Presence of air spaces(1mk)
7. Stomata(1mk)
8. What is the role of roof hairs in plants.(1mk)
9. What is meant by the term organ systems in organisms?(1mk)
10. State three factors that affect the rate of diffusion (3mks)
11. What is compensation point.(1mk)
12. a.State two properties of monosaccharide .(2mks)

b.What is the main function of monosaccharide in organisms?(1mk)

1. State the formula for calculating magnification when using the following
2. Hand lens/naked eyes (1mk)
3. A light microscopic (1mk)
4. Explain why a mule, a product of mating between a horse and a donkey is sterile .(1mk)
5. State two factors considered while grouping the organisms in the same species. (2mks)
6. Describe how you would carry out food tests to test the presence of starch and reducing sugars on a food sample.
7. Test for starch.(3mks)
8. Test for reducing sugar (4mks)
9. Explain how surface area to volume ratio idea may be applied to explain rate of diffusion in organisms.(2mks)
10. Which organelles in a cell perform the following functions
11. Manufacture of ribosomes(1mk)
12. Package cell secretions(1mk)
13. Energy production(1mk)
14. Synthesis of carbohydrates.(1mk)
15. Name the taxonomic unit with:
16. The greatest number of organism.(1mk)
17. The least number of organisms(1mk)
18. a.Define the term cell(1mk)

b.When onion epidermal cells were placed and focused along the diameter of the field of view ,10 cells were viewed and counted. Calculate the length of each epidermal cell in micrometers (1mm = 1000micrometers).Assume the diameter of field of view= 3mm(2mks)

1. Name the kingdom in which the organisms named below belong.
2. Bacteria(1mk)
3. Paramecium(1mk)
4. Yeast(1mk)
5. State the deficiency disease caused by deficiency of the following vitamins

a.Vitamins A(1mk)

b.Vitamin D (1mk)

c.Vitamin B1 (1mk)

1. a. State and explain how the ileum is adapted to perform its function.(4mks)

b.State two functions of the colon during digestion.(2mks)

1. a.Name two diseases that affect human teeth.(2mks)

b.(i) Write the dental formula of an adult human.(1mk)

ii)Work out the total number of teeth from the formula above.(1mk)

1. In an experiment to investigate a factor affecting photosynthesis, a leaf of a potted plant which had been kept in the dark overnight was covered with aluminium foil as shown in the diagrams below.



The set up was kept in sunlight for three hours after which a food test was carried out on the leaf.

1. Which factor was being investigated in the experiment?(1mk)
2. Which food test was carried out?(1mk)
3. I)Sate the results of the food test.(2mks)

ii) Account for the results in (c) (i) above.2mks

1. Why was is necessary to keep the plant in darkness before the experiment? 1mk
2. a. Distinguish between the term s homodont and heterodont (2mks)

b.Name the gap between incisors and premolars in some herbivores and state its function.(2mks)

1. State and explain how palisade cells are adapted to perform their function.(3mks)
2. a.Define the term active transport .(2mks)

b.State four factors that affect active transpiration.(4mks)

30. State the function of the following parts of a light microscope.

a. Coarse adjustment knob.(1mk)

b.Diaphragm(1mk)

c.Condenser(1mk)

31. Name the first four taxa in taxonomy starting from the highest level

1. a.Hydrogen atoms/ions/oxygen/hydroxide/ions/energy;(1mk)

b.Photolysis(1mk)

1. a.)Crenation(1mk)

b.Plasmolysis(1mk)

1. i) A – strip becomes longer and stiff (OWTTE)

D- strips becomes shorter and flexible. (1mk)

ii) Solution D is hypertonic to the cell; causing the cells to lose their water to the sugar solution by osmosis; making the cells to become flaccid(3mks)

1. a.Diffusion(1mk)

b.Potassium permanganate ions /particles are at a higher concentration in the visking tubing ;

hence they diffuse through the semi permeable visking tubing ; to distilled water

making the water to turn purple.3mks)

1. a.High /low temperature;

-pH

- Chemical inhibitors

-substrate concentration

-enzyme concentration (any 3=3mks)

b.Active sites;(1mk)

c.i) it would be denatured (1mk)

ii) it would be in activated(1mk)

1. a.To show that oxygen is produced during photosynthesis /to investigate the effect of light on photosynthesis /to investigate the gas produced during photosynthesis(1mk)

b.Concentartion of carbon(iv) oxide /temperature /light intensity(1mk)

1. they carry(genetic) information on growth and development of an organism(1mk)
2. a.to allow quick /faster penetration of light(1mk)

b.To store gases /to allow gaseous exchange(1mk)

c.for gaseous exchange(1mk)

1. to absorb water and mineral salts(1mk)
2. a group of organs working together for a particular function(1mk)
3. difference in concentration of particles between two regions,Acc.Conc gradient /diffusion gradient

-temperature

-Pressure - agitation /shaking

-size of the particles.(3mks) - thickness of membrane

1. the time when the rate of photosynthesis and respiration balance /when rate of consumption of carbon(iv) oxide and its production balance.(1mk)
2. a. Are soluble in water;

-they form sweet solutions

- can crystallize (any 2 2mks

b.are a source of energy (1mk)

1. a. Magnification =length of drawing 1mk

 length of actual object

acc.width for length

b.Magnification = eye piece lens magnification x objective lens magnification (1mk)

1. they do not belong to the same species;
2. –sharing of many features;

-ability to freely interbreed and produce fertile offspring;

1. Starch – add about 2cm3of iodine solution to the test substance ;a blue – black colour ; confirm starch present.(3mks)

Reducing sugar = add about 2cm3 of Benedicts solution to the test substances ;heat to boil; colour changes from due – green- yellow –orange ; confirming presence of reducing sugar;(4mks)

1. The greater the surface area to volume ratio; the faster the rate of diffusion(2mks)
2. A.Nucleolus(1mk)

b.Golgi bodies(1mk)

1. a.Kingdom(1mk)

b.Species(1mk)

1. a.It is the basic unit of life in an organism; (1mk)

b.3mm = 3000 micrometers

= 3000 = 300 micrometers 2mks

 10

1. a.Monera(1mk)

b.protoctista/protista(1mk)

c.Fungi(1mk)

1. a.Night blindness (1mk)

b.Rickets ;(1mk)

c.Beriberi(1mk

1. a.it is long to increase the surface area of absorption of food.

-it is richly supplied with blood to transport digested food.

-it is coiled to reduce the speed of flow of food and allow it to be fully digested /to occupy a smaller space/give more time for absorption

-has villi to increase surface area of absorption of food.

-it has a thin epithelium to allow faster diffusion of food molecule 1x4=4mks

b.absorption of water and mineral salts

-synthesis of vitamin K(2mks)

1. a. Dental carriers

-periodontal disease/gingivitis

-pyorrhea (2mks)

b.i. I 2 C 1 Pm 2 M 3 (1mk)

 2 1 2 3

* ii.2+1+2+3=8x2=16

2+1+2+3 = 8x2= 16

 32

1. a. Necessity of light in photosynthesis(1mk)

b.Test for starch /starch test/starch/starch.(1mk)

c.i)the covered part of the leaf remains brown/yellow /retains the colour of iodine(1mk)

and the uncovered part turns to blue black.(1mk)

ii.Starch was formed in the uncovered part (due to exposure to light)1mk

but no starch was formed in the covered part /due to lack of light(1mk)

iii.To destarch the leaf /prevent it from making starch /ensure o starch is in the leaf(1mk)

1. a.Homodant teeth –are of the same shape and size;heterodont teeth are of different shapes and sizse(2mks)

b. Diastema(1mk)

helps in turning of food /helps to manipulate the food.

Helps to temporary store food(1mk)

1. are closely arranged to increase the surface area for photosynthesis.

-chloroplasts are located on the upper part of the cells facing light

-they have thin walls for faster penetration of light (3mks)

1. a. Movement of particles /ions /molecules from a region of low concentration that of high concentration; and uses energy; acc movement against a conc gradient.

b.presence of oxygen

-presence of glucose

-presence of enzyme

-presence of inhibitors

-temperature

1. a. Raises /lower the body tube(1mk)

regulates the amount of light passing through the condenser(1mk)

c) concentrates light towards the specimen(1mk)

1. Kingdom

Division

Class

Order(4mks)

***NB: Stop marking when the order is wrong.***