

## **MARKING SCHEME BIOLOGY 1**

1. a) Membrane structure is describe as dynamic because
  - Much of the protein float about within the structure.
  - Lipids present in membrane also moves about. **(2marks any two points)**
- b)i) Cells lacking nucleus are
  - Mature phloem sieve tube cells.
  - Mature mammalian red blood cells. (1.5 marks any two points)
- ii) Cells having more than one nucleus are
  - Paramecium
  - Basidiomycetes
  - Mammalian white blood cells. (1.5 marks any two points)

2.

<b>INDUSTRIAL CATALYST</b>	<b>BIOLOGICAL CATALYST</b>
i. They are inorganic catalyst used in chemistry and industry.	-They are proteris ,catalyse chemical reaction in living system.
ii.They are effective in small amount .turnover number lie betwwen to 3,000,000	-Turnover numbers is less than 10,000
iii. Catalyst can be used repeatedly without undergoing any permanent chemical change.	-Most enzymes are specific to one particular type of substance molecules.
iv.They can not be denature.	-They can be denature.
v. Usually not affected by PH	-They are affected by PH

(2marks any 5points)

3. .a) i)It must be permeable so they gasaes can pass through.
- ii) It must be thin, because diffusion in only efficient over distance of 1mm or less.
- iii) It should posses a blood supply(sometimes good ventilation mechanism) in those organisms.
- iv) It should posses a large surface area so that sufficient amounts of gases are able to be exchange according to the organisms.
- v) Moist since oxygen and carbondioxide diffuse in solution.

(1marks any 5points)

b) Fats much richer in hydrogen than carbohydrates. As most the energy that in the body arises by oxidation of hydrogen to water ,so fats liberate more heat than carbohydrate.(5marks)

4. a)

NERVOUS SYSTEM	ENDOCRINE SYSTEM
I. Often short-term changes	-often long-term changes
II. Pathway is specific	-pathway not specific
III. Response often very localised	-response may be very widespread
IV. Rapid transmission and response	-slower transmission
V. Electrical and chemical transmission	-chemical transmission through blood system

➤ (1marks @ any 5 points)

- b) i. They have nerve cells that receive information from sensory part and transmit it to the CNS for interpretation.  
ii. They have neuroglia that provide protection and support to the tissue.  
iii. The cells in the PNS are capable ofregenerating themselves.  
iv. Have large number of mitochondria which help to regenerate energy.  
v.The cells of nervous tissue are tightly packed for effective working of the tissue. **(1marks@ any 5 points)**

5. a) i. Latin language.

- ii. The name of organism has two parts i.e generic and species name.  
iii. The names must be underlined separately or written in italics prints.

b) Nomenclature is a system of naming organisms which uses two names,genus name and specie name**WHILE** Systematic is the placing of organism into correct taxa.

c)

INDENTED KEY	BRACKET KEY
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I. The couplet are not numbered	-Couplet are numbered
II. Leads are next to each other	-Leads are far a part.
iii. They group the taxa	-The key do not group taxa
iv. The key require more space	-The key do not require large.

(1marks@ any 3points)

6. a)i.) **Basal metabolic rate**-This is the minimum rate of energy conversion required just to stay alive during complete rest or sleep .its also reffered to as resting metabolic rate(RMR) (2marks)

6 .a .ii.)

### **I. Body composition**

fat tissue has a lower metabolic activities than muscle fat tissue. As a lean muscles mass increases metabolic rateincreases.

### **II. Gender**

The basal metabolic rate (bmr) average 5 to 10 percent lower in women than a men.this is lergly because women being generally posses more body fat and less muscles mass than men to similar size.

### **III. Body size**

Metabolic rate increases of weight height and the surface of the area increases.

### **IV. Age**

A decrease in lean muscles mass during adulthood result in a slow steady decline of roughly 03 percent per year in BRM after the age of about 30.

### **V. Health**

This is the mass factors for the variation of basal metabolic rate forexample fever, illness, or injury may increase resting metabolic rate two –folds.

### **VI. Hormonal level**

Thyroxine (t4) the key hormone released by the thyroid glands has a significant effect inpon metabolic rate.

### **VII. Climate and body temperature**

The BMR of people in tropical climate is generally 5 to 20 percentage higher than their counter part living in more temperature area because it take energy to keep the body cool. (1marks@ any 5 points)

6b) i) **Respiratory quotient**-this is the ratio of carbondioxide produced to the oxygen consumed over a given period of time. (1mark)

ii) a) respiratory quotient it helps to indicate the type of a substrate oxidized example the Ra value of 10 inplies complete oxidation of glucose.

b) it helps to indicate the type of metabolism taking place. Foreexample if  $R_q$  values or less than one the following can be less than oxygen consumed. **(1marks@ any 2 points)**

7. a) Microspores are small in size compare to mega spores this is because megaspores it is used as a nutrient centres in the fertilization of the pollen grains therefore microspores it do not used as a nutrient center thus way it is small in size than megaspores. (2marks)

b).

- Fertilization it led to the formation of the new individual through the fussion of male and female genetes it led to the formation of an individual.
  - Fertilization it bring about the varion,this it occurs through the combination or the two parents characteristics.
  - Fertilization it bring the beginning of a life in sexual reproducing organism.
  - Fertilization it led to the increase in number of organism in the population.
- (1marks@ any 3 points)

c) i. In angiosperm fertilization occur after pollination this is the process or transferring pollen grains from the another to the stigma of the flower within the same plants or in a different plant but of the same species.

- ii. The arrival of the pollen grains on the stigma of a compatible species stimulates the secretion of sugary solution include sucrose from the stilar tissue.
- iii. As the pollen grain absorbs the stimulate the pollen grains to germinate and cause the intumescence wall to grow through the exine via one of its apertures as a pollen tube the pollen tube grow rapidly down the stilar tissue toward the ovule.
- iv. The chemical which secreted by a synergids in the embryo sac direct the growth of the pollen tube towards the micropyle then pollen tube burst open to release the two haploids male genets into the embryo sac.
- v. The entry of the sperm into the embryo sac or ovule is followed by fertilization flowering plants include bryophytes ferns, and gymnosperms, exhibit a unique type of fertilization called double fertilization which literally means two fertilization event in each ovule. **(1marks@ any 5 points)**

8. A) **starch –sugar hypothesis**

This is suggested that starch –sugar interconversion it responsible for the opening and closing of stomata the amount of starch in the guard cell increases during the day and decrease during the night. This is because photosynthesis result in the accumulation of the sugar in the guard cell this hypothesis it involve potassium and chloride ions hypothesis.

- In this present of the sunlight potassium ions (k) and chloride ions(cl) enter the guard cells by quatine mechanism stimulated by ATP enzyme which is located in the cell surface membrane through the entering of the potassium ions and chloride ions in the all thus it cause the targid of the guard cell result in an increase in the absence of sunlight forexample in the night the stomata pore closed as a result of the reversed process of opening or the closing of the stomata. (7marks)

B. i) **Transpiration** is considered to be necessary due to the following reasons.

- Through transpiration pull result into availability of water and minerals salt in various parts of the plant.
- Transpiration is the source of water required for the photosynthesis process.
- It helps the plant to remove the excess of the water in the plants.
- It helps the plants to absorb water and nutrient from the soil.
- It helps to add water in the atmosphere thus it turn condenses and then falls as rain to make water available in the soil. **(1marks@ any 5 points)**

ii. Transpiration is considered to be evil due to the following reasons.

- Transpiration it can cause the death of the plant due to the wilting process.
  - Transpiration also interferes with the process of gaseous exchange through the stomata.
  - Transpiration it reduce the water content in the soil.
- (1marks@ any 3 points)**

#### 9. a) **Similarities**

- Both have nucleus
- Both have cytoplasm.
- Both are haploid number of chromosomes(n). **(1.5marks@ any 3 points)**

#### Differences

- sperm has a tail while egg has no tail
  - sperm is elongated while egg is spherical in shape
  - sperm contain acrosome enzyme while egg has no acrosome enzyme
- (1.5marks@ any 3points)**

b) i. Inhibit ovulation by preventing the releasing of LH. (3marks)

c) Will led to miscarriage. (3marks)

10. a)

- ❖ Lipid require a lot of oxygen molecules.
  - ❖ Entry of lipid into respiratory metabolism it involves lengthy metabolic reaction.
  - ❖ Certain organs and cells such as brain can only utilize glucose not lipid.
  - ❖ Lipid is used as structural components in living organisms.
- (2marks@ any 4 points)**

b)

	<b>ATP</b>	<b>NADH<sub>2</sub></b>	<b>FADH<sub>2</sub></b>
Glycolysis	2ATP	2NADH <sub>2</sub>	
Pyruvate-acetyl	-	2NADH	
Krebs	2ATP	6NADH <sub>2</sub>	2FADH <sub>2</sub>
TOTAL	4ATP	10NADH <sub>2</sub>	2FADH <sub>2</sub>
	4ATP	10X3 = 30 ATP	2X2=4ATP
<b>(4+30+4)ATP=38ATP</b>			

**(7marks)**