**GATUNDU SOUTH EVALUATION EXAMINATION**

**KENYA CERTIFICATE OF SECONDARY EDUCATION**

**231/1**

**BIOLOGY PAPER 1**

**JULY 2019**

**MARKING SCHEME**

**1. Name the class to which the following organisms belong. [2mks]**

**[i] Spider** -Arachnida;

**[ii] Bean plant** -Dicotyledonae;

**2. Give a reason why coarse adjustment knob should not be used when viewing with high power objective lens. [1 mk]**

**-**The lens may crush the slide;

**-**The lens may be destroyed; *mark 1*

**3. a) State two functions of an electron microscope. (2 marks)**

-Magnification power;

-Resolving power;

**b)A Student was examining cells from an unidentified rabbit organ under an electron microscope and found that most cells are rich in rough endoplasmic reticulum** **and golgi bodies .What conclusion can you make concerning the organ .[2mks]**

-it’s a glanular organ; involved in processing and release of secretions;

**4.. A student dropped a small piece of fresh liver in a beaker containing hydrogen peroxide. A lot of fizzling and frothing was observed.**

**a. Name the gas produced. [1mk]**

**-**oxygen;

**b. write the word equation for the reaction above. [1mk]**

**-**Hydogen peroxide catalase water+oxygen;

**5. Compare the composition of blood in umbilical artery and umbilical vein. [2mks]**

**UMBILICAL ARTERY UMBILICAL VEIN**

-L ess food nutrients -more food nutrients ;

-less oxygen content -more oxygen content;

-more excretory waste -no/very little excretory waste;;

***Total mks 3 max 2***

**6. Give a reason why pre mature baldness tuft of hair in the nose and ear are characteristics found in males only. [1mk]**

**-**The genes controlling the characteristics are located on Y-chromosome only;

**7. Distinguish between osmotic pressure and osmotic potential. [2mks]**

**OSMOTIC PRESSURE OSMOTIC POTENTIAL**

-Tendancy of a solution to take up -Tendancy of a water molecule to diffuse out

water molecules[ when separated by a of a solution ;

semi permeable membrane ]

**8.. State two ways in which one can investigate the rate of transpiration in plants. [2mks]**

**-**Use of cobalt [ii ] chloride paper ;

-potometer **;**

**9. What is the effect of eating a meal with too much salt to urine production in human. [2mks]**

**-**Too much salts increases the osmotic pressure of body cell; more water is drawn by osmosis from glomenular filtrate back to the body; leading to production of low volume of concentrated urine;

***Total mks 3 max 2***

**10. Name the blood vessel that links arterioles with venues. [1mk]**

**-**capillaries;

**b. State two ways in which the blood vessel named in [a ] above is adapted to its functions. [2mks]**

**-**numerous to increase surface area for exchange of materials;

-narrow lumen to bring about ultrafiltration;

-thin wall to reduce diffusion distance; *mark first 2*

**11. (i) What is a dichotomous key? (1 mark)**

-A dichotomous key is a biological tool for identifying unknown organism upto some taxonomic level.

**(ii) State two characteristics of class Arachnida. (2 marks)**

-body has two parts the cephalothorax and abdomen

-ventral side of cephalothorax has two chelicerae each having claw like structure which produce poison to paralyse press.

-End of legs has two toothed claws. No antennal but have pedipalps.

-Has eight simple eyes *mark first 2*

**12. Outline two physiological conditions that may increase energy required per day in a woman. [2mks]**

**-**pregnancy;

-lactation;

-menstruation; *mark first 2*

**13. Tongue rolling is dominant over the inability to roll the tongue .In a family both the father and mother can roll their tongue of their two children one is a roller and the other is a non roller .Use letter R to represent the tongue rolling gene.**

**a. Write the possible genotypes of. [3mks]**

**i. father** – Rr;

**ii. mother** –Rr;

**iii. non –roller child** –rr;

b ] **Name the type of variation exhibited in the above case. [1 mk]**

**-**Discontinuous variation;

**14. Distinguish between the terms protandry and protogyny as used in reproduction in plants.**

**(2 marks)**

-Protandry: the stamen mature before the pistil of the same flower.

-Protogyny: the pistil mature before the stamen mature of the same flower.

**15. A person of blood group A cannot receive blood from a person of blood group B. Explain. [2mks]**

-Blood group Bhas antigen B which corresponds to anti body b of the recipient; hence agglutination will occur ;

**16. State two most significant factors that favour exponential growth of a population in any given habitat. (2 marks)**

– availability of food

- absence of predators

- absence of pest and disease

- enough space *mark first 2*

**17. State two economic importance of bacteria in nature. (2 marks)**

– causes diseases to both plants and animals

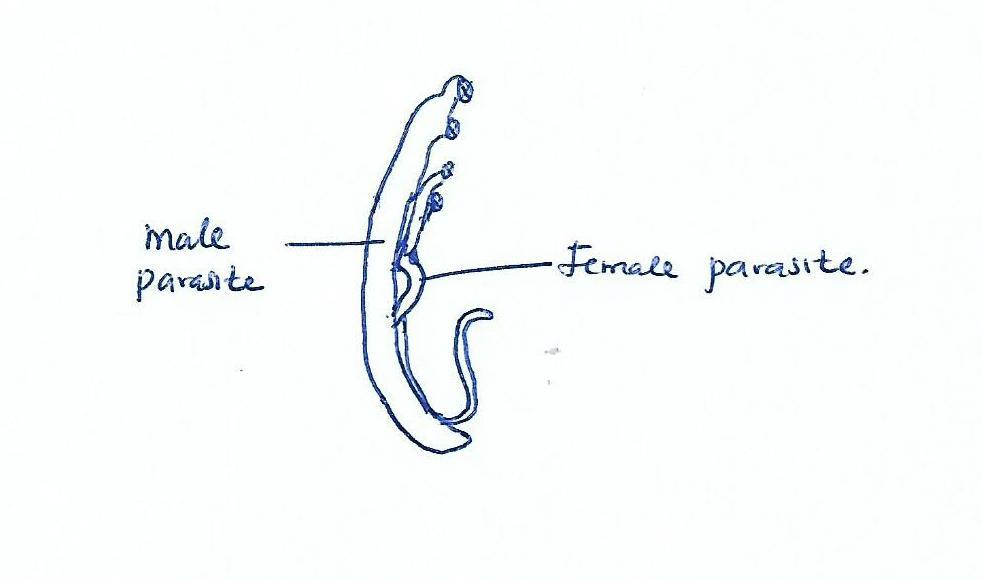
- saprophytic bacteria help in decomposition

- of organic materials

- help in nitrogen fixation

- fermentation process *mark first 2*

**18. A patient blood was found to have the parasite below:**

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**a. Name the parasite; [1mk]**

-schistosoma/ bilharzia worm

**b. Name the disease the patient was suffering from; [1mk]**

-Schistosomiasis/ bilharzia

**c. State three ways the above disease can be controlled. [3mks]**

-Proper disposal of human waste;

-Treating drinking water /boiling;

-Avoid bathing /swimming in water infested by snails;

-Avoid walking bare footed in stagnant water; *mark first 3*

**19. A human egg is described as haploid.**

**i. what is meant by the term haploid. [1mk]**

**-**have one set of parental chromosomes in a gamete;

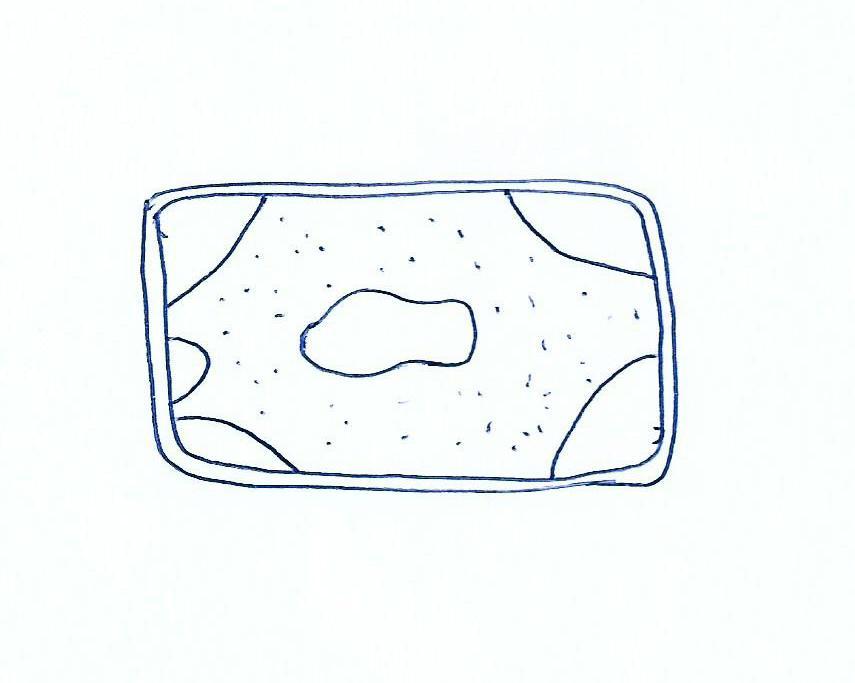
**ii. What is the importance of eggs being haploid? [1mks]**

-Maintain /restore same chromosomes number;

-prevent doubling /increase in number of chromosomes;

-Combining two [single]sets will restore correct number; *Total 3mks max 1*

**20. Below is a diagram of a plant cell**

****

**a. what name is used to describe such a cell. [1mk]**

-plasmolysed cell /flaccid cell;

**b. Describe what has happened to the cell [3mks]**

-The cell was placed in a hypertonic solution; lose water by osmosis and shrink; and cytoplasm pulls away from the cell wall;

**21. Explain how each of following affect enzyme controlled reaction;**

**i. Temparature (2mks)**

**-**low temperature inactivates enzymes hence decreases enzymatic activites;

-opitimum temperature gives highest maximum enzymatic activities;

-high temperatures denatures enzyme hence decreases enzymatic activity;

**ii. pH (1mk)**

Enzymes work best at optimum pH; extreme pH denatures enzymes

**22. Name the cartilage found in between vertebrae of vertebral column [1mk]**

**-**Intervertebral disc;

**b. State two functions of the cartilage named in [a] above [2mks]**

**-**Allows flexibility of the bones;

-Acts as a shock absorber;

**23. State two differences between smooth muscles and skeletal muscles** **[2mks]**



**SMOOTH SKELETAL MUSCLES**

**-**spindle shaped -cylindrical shaped;

**-**uninucleated -multinucleated;

**-**Involuntary -voluntary;

**-**in visceral organ -located on skeleton; *mark first 2*

**24. Give the difference between pyramid of biomass and pyramid of numbers [2mks]**

* Pyramid of biomass represents the dry mass of organisms at each tropic level; pyramid of numbers represents the number of organisms at each tropic level;

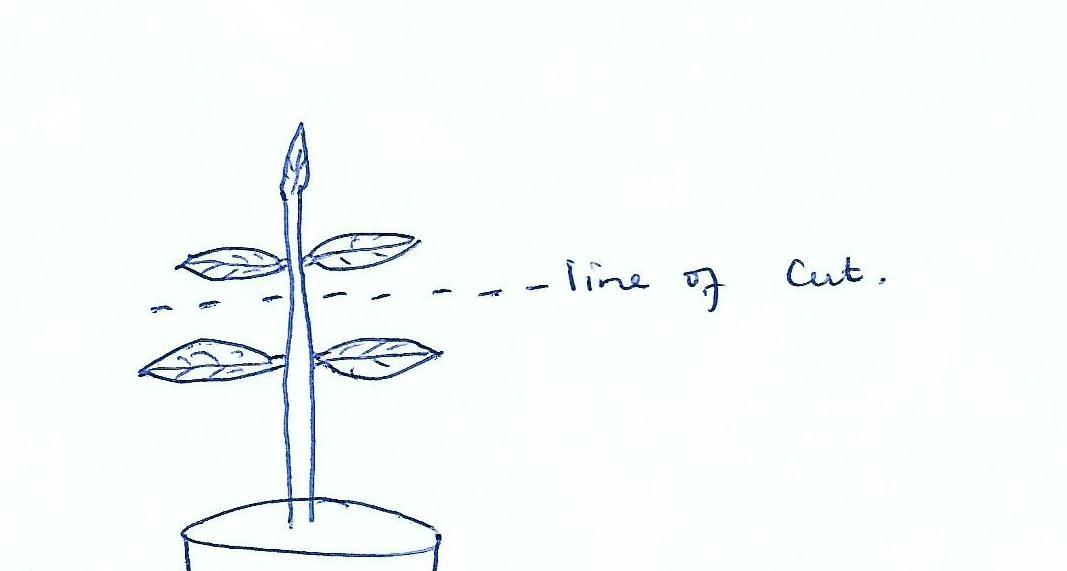
**b. Why is pyramid of biomass a better method of representing ecological relationships in habitats [1mk]**

* It illustrates the true flow of energy from one trophic level to another in a habitat;

**25. Explain why an athlete pants heavily after sprint race [2mks]**

-incurs shortage of oxygen in a race; breath heavily to provide oxygen is required to oxidize lactic acid produced;

**26. In an experiment a shoot tip of a young tomato plant was decapitated as shown below**



**a. State the expected results after two weeks [1mk]**

-The auxiliary /lateral buds will sprout/branches are formed;

**b. Give a reason for your answer in [a] above [2mks]**

**-**Decapitation removes the hormone auxin; produced at the root tip; absence of auxins promotes branching /development of axillary buds;

**27. State the importance of fossils as evidence of organic evolution. [2mks]**

-they give direct evidence of type organisms that existed at a certain geological age;

-it shows gradual increase in complexity of organisms over time;

-fossils show extinct animals;

**28. State the importance of the following features in a respiratory surface. [2mks]**

**i. moist**

-to dissolve the gases;

**ii. thin wall**

-to reduce the diffusion distance over which gases diffuse;

**29. When seedlings are grown in the dark, they become tall with long internodes, yellow in Colour and weak.**

a. **What name is used to describe the phenomenon. (1mk)**

- Etiolation;

**b. Explain the observation made above:(2mks)**

- In darkness synthesis of auxins increases; higher auxin concentration stimulates shoot cell elongation; (hence becoming tall).

**30. a) What is glycolysis (1 mark)**

-Breakdown of glucose;

**b) Where in a cell does glycolysis occur. (1 mark)**

- Cytoplasm;

**C)Explain why patients who cannot feed orally are given glucose in a drip. (1 mark)**

-Glucose is directly absorbed into cells without need for chewing and digestion;

**31.State the function of the following structures in the human n ear.**

1. **Semi – circular canals. (1mark)**

Maintenance of body balance and posture;

1. **Eustachian tube. (1mark)**

Equalizes air pressure in the outer and mid ear to prevent distortion of the ear drum;

**32. The table below shows some physiological changes observed in a person in two different regions. The results were taken after the person stayed in each region for 2 weeks.**

|  |  |  |
| --- | --- | --- |
| **Physiological change** | **Region I** | **Region II** |
| **Heart beat per minute** | **80** | **71** |
| **Breath** | **Very deep** | **Average** |
| **Breathing rate** | **fast** | **Average** |

1. **Which one of the regions was likely to be at 4,000M above sea level? Give a reason for your answer. (2 marks)**

-Region I less oxygen at higher altitudes hence faster and deeper breath; to draw in more air in order to meet the deficient normal inhalation would take less oxygen to lungs;

1. **Why was it necessary to take results after a duration of 2 weeks? (1marks)**

-Give time for the individual to acclimatize;