**MARKING SCHEME**

**231/1**

**BIOLOGY**

**PAPER 1**

**THEORY**

**EAGLE II JOINT EXAMINATION**

1. Give the structure of the cell that perform the following function-: (2Mks)
2. Regulate exchange of substances in and out of the nucleus
* **Reject Nuclear membrane, cell membrane.**
1. Synthesis of ribosomes :-
* **Nucleolus**
1. State the functions of the followings apparatus in collecting and observing specimens (3Mks)
2. **Pooter :- Used for sucking small animals from rock surfaces or bark of trees**
3. **Abait trap :- For attracting and trapping small animals e.g rats**
4. **Pit fall trap : - For catching crawling animals e.g. millipedes**
5. Define the term resolution (1Mk)
* **Ability of a microscope to distinguish between two close points as distinct entities**
1. Explain the absence of the following components in urine of a healthy person (2Mks)
2. Glucose
* **All glucose are actively reabsorbed in the blood stream**
1. Plasma proteins
* **Have large molecules size hence not filtered through small pores of the capillary walls of glomerulus**
1. Differentiate between primary and secondary growth (2Mks)
* **Primary growth occurs at the tip of the roots and shoots due to the activity of apical meristems resulting in increase in height. While secondary growth increase width/ girth due to activity of cambium meristem.**
1. Give a reason why lack of roughage in diet often leads to constipation. (1Mks)
* **Lack of roughage results in slow movement of food**

**7.a)**State the role of the following bacteria in the nitrogen cycle (3Mks)

i) Rhizobium bacteria: **Convert nitrogen gas into nitrates**

ii) Nitrosomonas :**Convert ammonia to nitrites**

 iii) Nitrobacter :**Convert nitrites to nitrates**

1. What is the function of carnassials teeth. (2Mks)
* **Slice flesh**
* **Crush bones**
1. List the changes that takes place during inhalation in the breathing cycle of mammal in the following (2Mks)
2. Ribcage :-
* **Moves upwards and outwards**
1. Diaphragm : -
* **Flattens**

**10.a)**What is metamorphosis (1Mk)

* **Changes in the body form during the life cycle of animal**

 b) What is the biological importance of the larval stage during metamorphosis (2Mks)

* **There is vigorous feeding; hence the insect obtain enough nutrients; rapid cell division for growth**

**11.a)** What is seed dormancy (1Mk)

* **A period in which a seed cannot germinate even if provided with all the conditions necessary for germination when conditions are suitable**

b) Name a growth inhibitor in seed (1Mk)

* **Abscisic acid** (reject wrong spelling)

c) Differentiate between hypogeal and epigeal germination in seeds (2Mk)

* **Epigeal the cotyledon is brought above ground level (due to elongation of hypocotyl, )**
* **Hypogeal cotyledon remain below ground level (due to elongation of epicotyls)**

**12.** Name the causative agent of the following diseases in man (2Mks)

a) Candidiasis :-

* **Candida albicans**

**b)** Syphilis:-

* **Treponema pallidum**

**13.** Study the diagram below and answer the questions that follow

1. i) Identify the type of circulatory system shown above (1Mk)
* **Single circulatory systems**

ii) Give a reason for your answer in (a) (i) (1Mk)

* **Blood flows through the heart once in a complete circulation**

ii) Give a disadvantages of this type of circulation (2Mk)

* **Blood flows under low pressure ; making circulation slow hence the animals are less active;**

**14.** Give a reason for each of the following biological phenomena (2Mks)

a) A mature plant cell does not lose its shape after losing water

* **Has a cell wall which gives a plant a regular shape**

b) Amoeba will not burst when placed in a hypotonic solution

* **Has a contractile vacuole for excretion of excess water.**

**15.** Mention two differences between pollen grains of wind and insect pollinated flower

 (2Mks)

|  |  |
| --- | --- |
| **Wind**  | **Insect**  |
| **small** | **Large**  |
| **Light**  | **Heavy** |
| **Smooth**  | **Rough/sticky** |
| **Numerous**  | **Few**  |

**16.** State the functions of the following structures in human reproductive system (3Mks)

* Seminiferous tubules **:- Produce sperms**
* Interstitial cells**:- Produces androgen / test to sterone**
* Epidydimis**: - Store sperms**

**17.** The following are text messages on a cell phone that represent gene mutation

Intended message Actual message

1. Buyme a coat Buyme a goat
2. John is paying John is praying

a) Identify the type of gene mutation that is represented in each case (2Mks)

* **A – Substitution**
* **B – Insertion**

b) Identify any two disorder arising due to gene mutation in humans (2Mks)

* **Albinism**
* **Sickle cell anaemia**
* **Haemophilia**
* **Colour blindness**

**18.** State one effect of magnesium deficiency in green plants. (1Mks)

* **Chlorosis/yellowing of leaves**

**19.** Explain why water logging of the soil may lead to death in plants. (2Mks)

* **When soil is water logged oxygen cannot diffuse into the root tissues hence no respiration**

**20.** A dog weighing 15.2kg requires 216kj while a mouse weighing 50g requires 2736kj per day. Explain. (2Mks)

* **A mouse has high surface area to volume ratio and tends to lose heat faster. It requires more energy to replace.**

**21.** The equation below shows an oxidation reaction of food substance.

 5C51 H98O6 + 145CO2 102CO2 + 98H20 + Energy

a) Determine respiratory quotient of the oxidation of food substance. (2Mks)

**RQ=CO2 produced =102**

 **O2 used up 145**

**RQ=0.7**

 (b)Give two reasons why the above food substance is not the substrate. (2Mks)

* **Not very soluble in water**
* **Require more oxygen to oxidise**

**22.** An individual is blood group B positive

a) Name the antigens in the individual’s blood (2Mks)

* **‘B’ and rhesus factors or antigen ‘D’**

b) Give the reason why the individual cannot receive blood from blood group A donor (2Mks)

* **Recipient plasma has antibody ‘a’ which corresponds to antigen A which causes antigen antibody reaction causing agglutinations of red blood cells**

**23.** Below data was obtained in an ecosystem

Mango tree - 1

Caterpillars - 100

Sparrow - 50

Hawk – 5

1. Sketch a pyramid of numbers for this feeding relationship (2Mks)

**5**

**50**

**100**

**1**

 **Hawk**

 **Sparrow**

 **Caterpillars**

 **Mango tree**

1. Identify the shape of the pyramid of number (1Mk)
* **Inverted pyramid of numbers**

**24**.a) What is organic evolution (2Mks)

* **Is the gradual emergence of complex life forms of organisms from pre-existing,**

**Simple life forms over a long period of time**

b) i)What are vestigial structure (1Mk)

* **Are structures that have ceased to be functional in some organisms and have over time reduce in size**

ii) Give two examples of vestigial structures in human (2Mks)

* **Appendix**
* **Coccyx**
* **Nictitating membrane**

**25.** Name the kidney disease which affects the glomerulus (1Mk)

* **Nephritis**

**26.** Name the kingdom to which plasmodium belongs. (1Mks)

* **Protoctista**

**27**. a) What is non- disjunction (1Mk)

* **Failure of homologous chromosomes to separate during cell division 1 resulting in gametes with extra chromosome and other with less**

b) State two disorders in human that are as a results of non-disjunction (2Mks)

* **Down’s syndrome**
* **Turner’s syndrome**
* **Klinefelter’s syndrome**

**28.** Name two external features found in the class Mammalia only. (2Mks)

* **Have mammary glands**
* **Body covered with fur/hair**
* **Have pinna**

**29.** State two roles of diffusion in human being. (2Mkss)

* **Absorption of digested food materials into the blood stream**
* **Gaseous exchange.**
* **Excretion of nitrogenous waste**

**30.** How do the following factors affect the rate of diffusion. (2Mks)

a) Diffusion gradient

* **The greater the diffusion gradient, the greater the rate of diffusion**.

b) Surface area to volume ratio

* **The greater the surface area the higher the rate of diffusion**.

**31.** Name two fat soluble vitamin manufactured by the human body. (2Mks)

* **Vitamin D,K,A**

**32.** Name two sites of gaseous exchange in frogs. (2Mks)

* **Skin**
* **Mouth**

**33.** State two characteristic features of members of division Bryophyta. (2Mks)

* **Absence of vascular bundles**
* **Body parts not differentiated into roots, stem and leaves**

**34.** How are lenticels adapted for gaseous exchange**.** (2Mks)

* **Cells are loosely arranged to facilitate air circulastion.**
* **Cells have moist surfaces; to dissolve respiratory gases**.