**Name** ………………………………………………… **Class** …….. **Index No**. …………..………/……..

**231/1 Candidate’s Signature** ……………...………..

**BIOLOGY**

**Paper 1 Date** …………………..

**(Theory)**

**June/ July, 2013**

2 hours

**Kenya Certificate of Secondary Education**

**MOCK EXAMINATIONS, 2013**

***Instructions to candidates***

*Write your name, class and index number in the spaces provided above.*

*Append your signature and write the date of examination in the spaces provided above.*

*Spelling errors especially of Biological terms shall be penalized*

*Answer* ***ALL*** *questions in the spaces provided.*

**For Examiner’s Use Only**

|  |  |  |
| --- | --- | --- |
| **Question** | **Maximum Score** | **Candidate’s Score** |
| **1 – 29** | **80** |  |

**This paper consists of 10 printed pages.**

**Candidates should check the question paper to ascertain that**

**all the pages are printed as indicated and no questions are missing.**

1. Name **two** metallic ions involved in transmission of nerve impulses **(2 marks)**

…………………………………………………………..………………………………...…………

…………………………………………………………..………………………………...…………

1. Write out an equation summarizing the process of anaerobic respiration in plants **(1 mark)**

………………………………………………………………………………………………………………………

1. Name **one** animal cell and **one** plant cell that has no nucleus when fully developed

**(2 marks)**

**Animal cell** ………………………………………………………………………………..

**Plant cell** ………………………………………………………………………………..

1. State any **two** features of a homologous pair of chromosomes **(2 marks)**

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

1. Name **two** respiratory surfaces in terrestrial plants **(2 marks)**

……………………………………………..........................................................................…………

……………………………………………..........................................................................…………

1. Define Heterostyly **(1 mark)**

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

1. The following statements are cellular short messages and represent gene mutations

 **Intended message Actual message**

**I** Eat the meat Heat the meat

**II** This is my team This is my tea

Identify the type of mutation represented in each case **(2 marks)**

**I** ………………………………………………………………………………………….

**II** ………………………………………………………………………………………….

1. **(a)** Name the most appropriate hand- held piece of apparatus used to pick a scorpion from a bait

Trap **(1 mark)**

………………………………………………………………………………………………………………………

**(b)** State **one** other precaution that should be taken before picking the scorpion **(1 mark)**

………………………………………………………………………………………………………………………

1. During which phase of meiosis I does crossing over occur? **(1 mark)**

………………………………………………………………………………………………………………………

1. Name the spore-producing structures in
2. Bryophytes ……………………………………………………………………………. **(1 mark)**
3. Pteridophytes ………………………………………………………………………….. **(1 mark)**
4. State **two** factors within the seed, which would cause dormancy **(2mark)**

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

1. **(a)** Name the membrane that surrounds the mammalian heart **(1 mark)**

………………………………………………………………………………………………………………………

**(b)** Give **two** functions of the membrane mentioned in **(a)** above **(2marks)**

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

1. State **three** processes that take place during the interphase stage of cell division, in a plant cell **(3 marks)**

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

1. Name the hormone responsible for
2. Conversion of glycogen to glucose **(1 mark)**

………………………………………………………………………………………………………………………

1. Regulation of the amount of water in mammalian blood **(1 mark)**

………………………………………………………………………………………………………………………

1. **(a)** What is the function of co-factors in cell metabolism? **(1mark)**

………………………………………………………………………………………………………………………

**(b)** Give **one** example of a metallic co-factor **(1 mark)**

………………………………………………………………………………………………………………………

1. **(a)** In which **two** ways are chloroplasts and mitochondria similar? **(2 marks)**

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

**(b)** Where in a chloroplast does each of the following processes occur? **(2 marks)**

1. Photolysis ……………………………………………………………………………………………

1. Carbon (iv) oxide fixation …………………………………………………………………………..
2. Name **two** mineral elements necessary in the synthesis of chlorophyll **(2 marks)**

………………………………………………………., ……………………………………………………….

1. What **two** ideas are proposed in Jean Baptiste Lamarck’s theory of evolution? **(2 marks)**

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

1. State **three** sources of water for our bodies’ use **(3 marks)**

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

1. Name **two** processes that bring about the translocation of manufactured food **(2 marks)**

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

1. Outline **two** reasons why blood clotting **does not** ordinarily occur inside blood vessels

**(2 marks)**

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

1. **(a)** Give the type of response shown by tendrils in plant stems **(1 mark)**

………………………………………………………………………………………………………………………

**(b)** State the function achieved by the response named in **(a)** above **(1 mark)**

………………………………………………………………………………………………………………………

1. The body cells of an organism contain two copies of 24 000 genes i.e. 48 000 genes in total. Of these, how many genes would have been inherited from the mammal’s female parent?

**(1 mark)**

………………………………………………………………………………………………………………………

1. Colchicine is a chemical substance which prevents the formation of spindle fibres during mitosis. The chromosomes replicate normally and chromatids separate. However, the cell then forms a nuclear membrane and encloses all the chromosomes. What will be the ploidy condition of the resultant cell? **(1 mark)**

………………………………………………………………………………………………………………………

1. State **one** role of each of the following reagents in testing a given stock solution for the presence of non-reducing sugar

**(a)** 1% hydrochloric acid solution **(1 mark)**

………………………………………………………………………………………………………………………

**(b)** Sodium hydrogen carbonate powder **(1 mark)**

………………………………………………………………………………………………………………………

1. Name, precisely, the structure described in each of the following statements **(4 marks)**
2. The structure that transports deoxygenated blood from the mammalian heart

………………………………………………………………………………………………………………………

1. The epithelial cell that secretes mucus in the mammalian trachea

………………………………………………………………………………………………………………………

1. The structure that keeps the mammalian trachea open, preventing its collapse during inhalation and exhalation

………………………………………………………………………………………………………………………

1. Blindly ending pouch (about 7cm long and 1.2cm diameter) leading from the caecum and which possesses no known function in the human digestive system

………………………………………………………………………………………………………………………

1. To estimate the population size of *Cancer pagurus*, a species of a large edible crab of a red-brown colour, in a lagoon, 400 crabs were trapped, marked and released. After four days, 374 crabs were trapped and of these 87 had been previously marked. What was the estimated size of the population? **(2 marks)**

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

1. Shown below is the time taken by cobalt chloride paper to turn pink on upper and lower leaf surfaces of two species of plants- **X** and **Y**

|  |  |  |
| --- | --- | --- |
| **Species** |  **Upper surface** |  **Lower surface** |
|  **X** |  27 seconds |  42 seconds |
|  **Y** |  35 seconds |  21 seconds |

1. What is the likely habitat of the plant species labeled **X**? **(1 mark)**

………………………………………………………………………………………………………………………

1. Account for the results obtained for plant species **Y** **(3 marks)**

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

1. Illustrated below are the dates of menstruation and ovulation in a human female, in a 31-day period of time

 **Menstruation ovulation**

****

 **1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31**

Indicate on the illustration, the dates during which the female would most likely conceive if sexual intercourse took place **(1 mark)**

1. The diagram below shows a specialized plant cell



1. Identify the cell ……………………………………………………………………… **(1 mark)**
2. Name each of the parts labelled **D** and **E** **(2 marks)**

**D** ………………………………………………………………………………………..

**E** ………………………………………………………………………………………..

1. State the function of the part labelled **C** **(1 mark)**

………………………………………………………………………………………………………………………

1. Diagrams **C1**, **C2**, **C3** and **C4** below (on page **8**) show a cell undergoing division
2. The correct sequence of events is **(1 mark)**

………………………………………………………………………………………………………………………

 **   **

1. **(i)** Is this a plant or an animal cell? **(1 mark)**

………………………………………………………………………………………………………………………

**(ii)** Give **one** reason for your answer in **(b)(i)** above **(1 mark)**

………………………………………………………………………………………………………………………

1. The diagrams below are of two conducting structures in the xylem tissue

**A**

****

1. Identify each of the structures shown above **(2 marks)**

 **A-** ……………………………………………… **B-** …………………………………………………

1. Give **two** differences between the structures shown above **(2 marks)**

………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………

1. On diagram **A**, name **two** parts of the structure **(2 marks)**
2. The diagram below (on page **9**) shows a red blood cell and the concentration of ions (in mm dm-3) in the blood plasma and in the cell

Which ions are actively transported

1. Into the red blood cell? ………………………………………………………………… **(1 mark)**



Which ions are actively transported.

1. Into the blood plasma? …………………………………………………………. **(1 mark)**
2. The equation for the oxidation of a certain chemical substance **X** is as shown below

2C51H98O6 + 145O2  102CO2 + 98H2O

 Substance **X**

1. Work out the respiratory quotient for the oxidation of substance **X (1 mark)**

………………………………………………………………………………………………………………………

1. What inference can be made from your answer in **(a)** above, about substance **(1 mark)**

………………………………………………………………………………………………………………………

1. In an investigation carried out in a certain terrestrial ecosystem, the population sizes and biomass of four species were determined and recorded. The results were as shown below

**Species Population Size Biomass (kg)**

 **S1** 1 x 103  1 x 103

 **S2** 1 x 103  1 x 10-1

 **S3** 1 x 105  1 x 101

 **S4** 1 x 101  1 x 104

From the results above

1. construct a food chain involving the organisms in the ecosystem **(1 mark)**

………………………………………………………………………………………………………………………

1. construct a pyramid of numbers of the organisms in the ecosystem **(2 marks)**

***This is the last printed page of this paper***