**Name ------------------------------------------------- Index number ----------------------------------**

**Candidate’s Signature --------------------------- Date -----------------------------------------------**

**231/2**

**BIOLOGY PAPER 2**

**2 hours**

**FORM 4**

**Instruction to the candidates.**

* Write your name admission number and class in the space provided.
* This paper has two sections A and B.
* In section B answer questions 6 (compulsory) and either question 7 or 8 I the places provide after question 8.
* Write your answers in the space provided on the question paper.
* Candidates should answer the question in English.

For examiner’s use only

|  |  |  |  |
| --- | --- | --- | --- |
| Section | Question | Maximum score | Candidates score |
| A | 1 | 8 |  |
|  | 2 | 8 |  |
|  | 3 | 8 |  |
|  | 4 | 8 |  |
|  | 5 | 8 |  |
| B | 6 | 20 |  |
|  |  | 20 |  |
|  | TOTAL SCORE | 80. |  |

**SECTION A (40 marks)**

**Answer all questions in this section in the spaces provided**

1. The diagram below represents a section of a leaf.



1. I) Name the part labeled X and Y. (2 marks)

X ----------------------------------------------------------------

Y -----------------------------------------------------------------

II. Using the arrows indicate on the diagram the direction of flow water during the transpiration stream. (1 mark)

-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

III. State one way in which the leaf is suited to gaseous exchange. (1 mark)

-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. The diagram below shows a vertical section through a mammalian heart.



1. Name the parts labeled A, E and F (3 marks)

A -----------------------------------------------------------------

E ----------------------------------------------------------------

F ----------------------------------------------------------------

1. Give a reason why the wall of chamber C is thicker than chamber D. (1 marks)

-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. A) Distinguish between monoecious and dioecious plants. (1 mark)

-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

B) Explain how the following prevents self fertilization

1. Protandry (1 marks)

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. Self sterility (1 mark)

---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

C) The diagram below representation a stage during cell division



D) I) Identify the stage of cell division (1 mark)

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

II) Give two reasons for your answer in (a)(i) above (2 marks)

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

E) State the functions of the following parts of the embryo

1. Chorion. (1 mark)

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. Amnion. (1 mark)

-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. A) When the offspring’s of the purple and white flowered pea plants were crossed, they produced purple and white flowered plants in the ratio 3:1. Using letter H to represent the gene for purple color,
2. State the genotype of
3. Parents. (1 mark)

-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. F1 generation. (1 mark)

-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. Work out the cross between plants F1 generation. (4 marks)

-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. Name two sex linked traits in human beings (2 marks)

----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. A) The diagram below represents a mammalian pelvic girdle.



1. Name the parts labeled H, F and G. (3 marks)

H ----------------------------------------------------------------------------------------------

F ----------------------------------------------------------------------------------------------

G ---------------------------------------------------------------------------------------------

1. How is structure labeled H adapted to its function? (1 mark)

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. What is the function of X? (1 mark)

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. Name the bone that articulates part F (1 mark)

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. A response exhibited by a certain plant tendril is illustrated below.



Name the type of response (1 mark)

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. Name a support tissue in plants that is thickened with lignin. (1 mark)

----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. A) Name the organism that causes amoebic dysentery. (1 mark)
2. Construct a dichotomous key using two leaves one pinnate and the other bipinnate…… (2 marks)

---------------------------------------------------------------------------------------------------------------------------- ----------------------------------------------------------------------------------------------------------------------------

1. The following below representing feeding relationship in an ecosystem.



1. Write down the food chains in which the guinea fowl are secondary consumers. (2 marks)

---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. What would be the short term effects on the ecosystem if lions invaded the area? (2 marks)

---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. Name the organism through which energy from the sun enters the food web. (1 mark)

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**SECTION B (40 MARK)**

Answer question 6 and either question 7 or 8 I the spaces provided after question 8.

1. An experiment was carried out to investigate transpiration and absorption of water in sunflower plants in their environment with adequate supply of water. The amount of water was determined in two hour intervals. The results are shown in the table below.

|  |  |  |
| --- | --- | --- |
| Time of the day | Transpiration (amount of water in grams) | Absorption (amount of water in grammes) |
| 11.00-13.00 | 33 | 20 |
| 13.00-15.00 | 45 | 30 |
| 15.00-17.00 | 52 | 42 |
| 17.00-19.00 | 46 | 46 |
| 19.00-21.00 | 25 | 32 |
| 21.00-23.00 | 16 | 20 |
| 23.00-1.00 | 08 | 15 |
| 1.00-3.00 | 04 | 11 |

1. Using the same axis, plot graph to show transpiration and absorption of water in grammes against time of the day. (7 marks)
2. At what time of the day was the amount of water the same for transpiration and absorption? (1 mark)

----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. Account for the shape of the graphs of:
2. Transpiration. (3 marks)

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. Absorption. (3 marks)

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. What would happen to transpiration and absorption, if the experiment was continued up to 5.00 hours? (2 marks)

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. Explain two factors that may affect transpiration and absorption at any given time. (2 marks)

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. Describe the:
   1. I) process of inhalation in mammals. (6 marks)

II) Mechanisms of opening and closing of stomata in plants (4 marks)

* 1. Describe the role of skin during hot environmental conditions (8 marks)

1. A) Discuss how the following parts of the mammalian ear are adapted to their functions;
2. Tympanic membrane
3. Eustachian tube
4. Ear ossicles. (10 marks)

B) Describe methods of controlling water pollution. (10 marks)

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

-----------------------------------------------------------------------------------------------------------------