**NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**CLASS\_\_\_\_\_\_\_\_\_\_\_\_\_ ADM.NO.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**231/2**

**BIOLOGY**

**THEORY**

**END OF TERM 3 2022**

**TIME: 2 hours**

**INSTRUCTIONS TO CANDIDATES**.

\* Answer ALL the questions in Section a in the spaces provided.

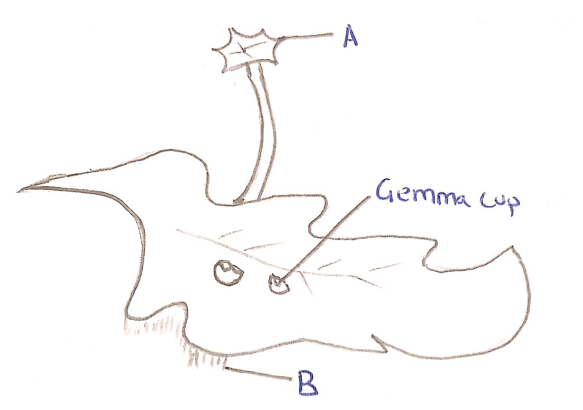
\* In Section B, answer questions 6 (compulsory) and either questions 7 or 8 in the spaces provided.

\* Answer all the questions in correct English.

**FOR EXAMINER’S USE ONLY.**

|  |  |  |  |
| --- | --- | --- | --- |
| **SECTION** | **QUESTION** | **MAXIMUM SCORE** | **CANDIDATE’S SCORE** |
| A | 1 | 8 |  |
|  | 2 | 8 |  |
|  | 3 | 8 |  |
|  | 4 | 8 |  |
|  | 5 | 8 |  |
|  | 6 | 20 |  |
|  | 7 | 20 |  |
|  | 8 | 20 |  |
|  | **TOTAL SCORE** | **80** |  |

1. Study the diagram below and answer the questions that follow.



(a) Name the division to which the organism belongs giving two reasons for your answer. (3 mks)

(i) Division ………………………………………………

(ii) Reasons ………………………………………………………………

………………………………………………………………

(b) Name the function of the part labeled (2 mks)

A ……………………………………………………………………………

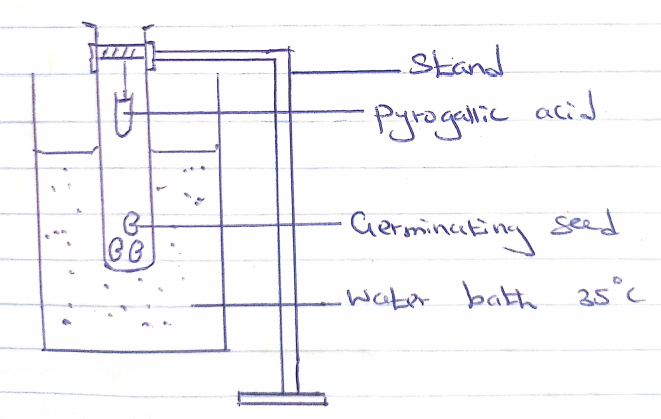
B …………………………………………………………………………….

(c) State three differences between the above named Division and a flowering plant.

(3 mks)

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2. The diagram below shows a set up to investigate a factor necessary for germination.



(a) Name the factor under investigation. (1 mk)

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2. (b) State the role of pyrogallic acid in the set up. (1 mk)

…………………………………………………………………………………..

(c) Which type of respiration is taking place in beans? (1 mk)

………………………………………………………………………………….

(d) Write a word equation for the process in (c) above. (1 mk)

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(e) Explain why plants can only carry out the above respiration process for a

short time. (1 mk)

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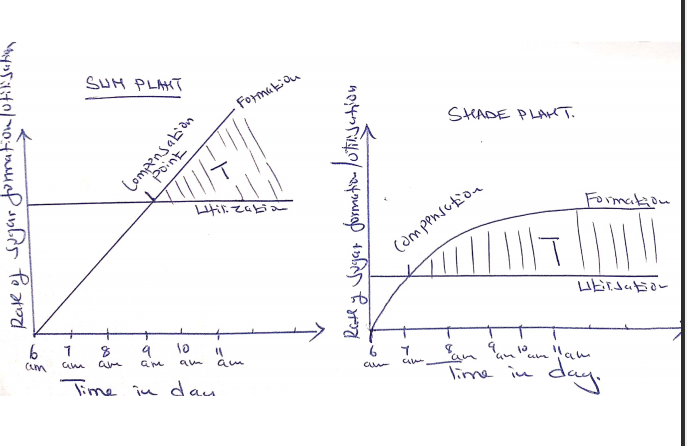
(f) State other three factors for germination. (3 mks)

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3. Figure 1 and 2 below show the rate of sugar formation and utilization in sun plants and shade plants respectively.



(a) (i) State the advantages of the shade plant reaching compensation point

earlier in the day than the sun plant. (2 mks)

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

(ii) What is represented by letter T? (1 mk)

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(b) Compare photosynthesis and respiration as they occur in organisms.(2 mks)

Photosynthesis Respiration

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…………………………………………. ………………………………………

4. (a) What is internal fertilization? (1 mk)

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(b) Suggest **two** disadvantages of internal fertilization in most mammals.(2 mks)

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(c) State **two** roles of the placenta in mammals. (2 mks)

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(d) Mention **one** role played by each of the following hormones in human menstrual cycle. (3 mks)

(i) Oestrogen hormone…………………………………………………………

(ii) Leutenising hormone……………………………………………………….

(iii) Follicle stimulating hormone……………………………………………….

5. The volume of gases contained in 100cm3 of blood samples were at two points in the mammalian circulatory system. The results were tabulated below.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Oxygen | Carbon (IV) oxide | Nitrogen |
| Blood entering lings (cm3) | 8.42 | 55.70 | 0.75 |
| Blood leaving lungs (cm3) | 20.75 | 30.15 | 0.75 |

(a) Account for the differences in gaseous composition of:

(i) Blood entering lungs (2 mks)

(ii) Blood leaving lungs (2 mks)

(b) Name the blood vessel through which blood enters the lungs. (1 mk)

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(c) Explain why athletes in Kenya prefer training in high altitude areas.(3 mks)

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6. In an experiment to investigate the activity of amylase enzyme, the amount of maltose formed at different concentrations of chloride ions was determined and recorded in the table below. The investigations were carried out a 25oC

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Chloride ion conc.(mg/100ml) | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 |
| Maltose formed (mg) | 1.5 | 1.6 | 2.4 | 5.9 | 8.6 | 11.7 | 11.7 | 11.7 |

(a) Plot a graph of maltose against chloride ion concentration. (6 mks)

(b) Account for the shape of the graph. (4 mks)

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(c) What is the optimum chloride ion concentration for amylase activity?(1 mk)

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(d) Explain the role of chloride ions in amylase activity. (2 mks)

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(e) What is the source of chloride ions in human digestion? (1 mk)

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(f) Determine the amount of maltose formed at chloride ions concentration of 0.045.

(1 mk)

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(g) Other than the factor above, state three other factors that affects enzymatic reaction. (3 mks)

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(h) State any two enzymes found in a germination seed. (2 mks)

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7. (a) Describe the adaptations of *schistosoma* spp to their parasitic mode of life.

(10 mks

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(b) Describe the adaptations of halophytes to their habitat. (10 mks)

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8. (a) Describe the mechanism of inhalation and exhalation in mammals. (10 mks)

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(b) Explain three factors which affect breathing rate in mammals. (10 mks)

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