**DECEMBER HOLIDAY ASSIGNMENT, 2022**

**FORM 2 -BIOLOGY**

***Excretion and homeostasis***

1. Explain the following: - i) Fresh water fish excrete ammonia

ii) Glucose is absent in urine yet present in glomerular

filtrate

2. (a) State two functions of the kidney

(b) Name two substances that are not found in urine of a healthy person

(c) Name two diseases that affect the kidney

3. (a) State two structural modification of the kidneys of deserts animals like kangaroo rat.

(b) Describe how ingestion of very salty food may reduce the amount of water excreted

in urine.

4. A student mixed a sample of urine from a person with Benedict’s solution and heated, the

colour changed to orange.

(a) What was present in the urine sample?

(b) What did the student conclude on the health status of the person?

(c) Which organ in the person may not be functioning properly?

5. (a) If the human pancreas is not functional: -

(i) Name the hormone which will be deficient

(ii) Name the disease the human is likely to suffer from

(b) What is diuresis?

6. State one structural adaptation of nephron in the kidney of a desert mammal

What is the importance of sebaceous glands in the human skin?

7.. Explain why sweat accumulates on a person’s skin in a hot humid environment

8. Distinguish between diabetes mellitus and diabetes insipidus

9. State two processes through which plants excrete their metabolic wastes.

10. State three importance of Osmosis in plants

11. A patient was complaining of thirst most of the times. A sample of the patient’s urine was

found not to contain a lot of sugar but was dilute: -

(a) Name the hormone the person’s body was deficient of

(b) Which gland produces the above hormone

(c) Name the disease that the patient was most likely suffering from

12. State two features in the nephron that facilitate ultra-filtration

13. What role is played by the liver in excretion?

14. The equation below represents a metabolic process that occurs in the mammalian liver:

Amino acids organic compound + urea

a) Name the process

(b) What is the importance of the process to the mammals?

36. In an investigation, two persons A and B drunk the same amount of glucose solution.

Their blood sugar levels were determined immediately and thereafter at intervals of one

hour for the next six hours. The results were as shown in the following table: -

|  |  |  |
| --- | --- | --- |
| Time (hrs.) | Blood glucose level (mg/100ml) | |
|  | Person A | Person B |
| 0 | 90 | 120 |
| 1 | 220 | 360 |
| 2 | 160 | 370 |
| 3 | 100 | 380 |
| 4 | 90 | 240 |
| 5 | 90 | 200 |
| 6 | 90 | 160 |

(a) Draw a graph of blood sugar levels of persons A and B against time on the same axis

(b) Explain each of the following observations; -

(i) Blood sugar level increased in person A between 0 and 1 hour

(ii) The blood sugar level dropped in person A between 1 and 4 hours

(c) From the graph, what is the normal blood glucose sugar level for human beings

(d) Suggest a reason for the high sugar level in person B

(e) How can the high blood sugar level in person B controlled?

(f) What is the biological significance of maintaining a relatively constant sugar level in a human being.

(g) Account for the decrease in the blood glucose level of person B after 4 hours

37. An experiment was carried out to determine the effect of drinking on excess amount of water on the flow of urine. A person drinks one litre of water and urine was collected at intervals of 15minutes. The results were as shown below:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time in minutes | 0 | 15 | 30 | 45 | 60 | 75 | 90 | 105 | 120 | 135 |
| Urine output ml/min | 1.6 | 1.6 | 1.6 | 5.4 | 9.0 | 9.0 | 7.6 | 3.0 | 0.8 | 0.8 |

(a) Plot a suitable graph to represent urine output with time.

(b) Explain the rate of flow of urine between the following times;

(i) 15 and 60minutes.

(ii) 60 and 75minutes.

(iii) 75 and 135 minutes.

(c) Name two hormones responsible for regulation of relative amount of salts and water in man.