**FORM 4 BIOLOGY EVALUATION TEST TERM 1 2020**

**NAME ………….…………………………………………INDEX NO ………….…………………..**

* 1. The equation below represents a metabolic process that occurs in a certain organ in the mammalian body.

Ammonia + carbon (IV) oxide enzyme organic compound Q + water

1. Name the process represented in the equation above. (1 mark)

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

1. Name the organ in which the process occurs. (1mark)

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

1. Why is the process important to mammals (1mark)

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

1. Identify the organic compound Q. (1 mark)

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

1. Explain the source of ammonia in the organ named in (b) above. (2 marks)

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

1. What happens to organic compound Q.? (2 marks)

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

* 1. An athlete training to take part in an international competition moved to a high altitude area where he was to train for twelve (12) days before the competition. He took his pulse rate per minute daily and tabulated them as shown below

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DAY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Pulse per minute | 72 | 78 | 89 | 92 | 92 | 90 | 86 | 80 | 77 | 74 | 72 | 72 |

1. Other than pulse rate, name one other process which was affected by change in altitude. (1mark)

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1. Account for the change in pulse rate from.
2. Day 1 to day 7 (1 mark)

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1. Day 8 to day 12 (1 mark)

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

1. Explain the advantage this athlete has over the one who trains in a lower altitude area. (2 marks)

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1. The equation below represents a reaction which takes place during rapid muscular movements in humans.

Glucose lactic acid + 150kj

1. State two effects of this reaction to an individual (2 marks)

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1. How is lactic acid finally eliminated from the muscle tissue after the muscle return to normal movement (1 mark)

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* 1. Study the diagram below and answer the questions which follow.



1. Identify the muscle represented by letters A and B (2 marks)

A

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

B

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

1. Describe how muscles A and B cause straightening of joint C (2 marks)

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

(b) Name the joint C (1 mark)

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

(c) Name parts label D, E and F (3marks)

 D

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

 E

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

 F

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

* 1. In a certain bird species red flight feathers is controlled by gene R while white flight feather is controlled by gene r. The heterozygous condition Rr results into pink flight feathers.
1. By use of a punned or fusion lines, find the genotype of a cross between pink flight feathered bird and white flight feathered bird.

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1. Which type of dominance is illustrated here? (1 mark)

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1. i) Identify the nuclei acid whose base sequence is shown below. (1 mark)

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 G - A - C - U - A - G - C - G - U

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

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1. If this nucleic acid was involved in protein synthesis, how many amino acid would be present in the protein synthesized.

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* 1. The diagram below represents a longitudinal section through the ileum wall.



1. Identify the structures labeled X and Y (2 marks)

 X

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

 Y

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

1. State one function of X and Y (2 marks)

 X

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

 Y

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

1. State two functions of the ileum (2 marks)

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

1. Explain the role of the liver in digestion (1mark)

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1. State the endocrine (hormonal) role of pancreas in a mammal (1mark)

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* 1. (a) How are lungs adapted to their function?

(b) Describe the mechanism of opening and closing of the stomata using the photosynthesis theory.

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**MARKING SCHEME BIO F4**

1. (a) Detoxification;

 (b) Liver;

 (c) Prevents ammonia from accumulating to toxic levels;

 (d) Urea;

 (e) Excess amino acids are broken down/delaminated to form amino group; which is combined with

 hydrogen atom to form ammonia;

 (f) It is transported to the kidney; where it is excreted;

1. (a) Increase in breathing rate;

 (b) (i) Lower concentration of oxygen in high attitude area; raises the demand of oxygen by body cells;

 (ii) Number of red blood cells has increased hence enough oxygen is reaching all body Cells adequately;

(c) Has a higher capacity of transporting oxygen to body cells; due to higher number of redblood cells in the body;

 (d) (i) Muscle crump;

 Muscle fatigue

 (ii) It is completely oxidized by oxygen into water, Carbon (IV) oxide and energy/is converted into glycogen for storage;

1. (a) (i) A – Biceps

 B – Triceps

 (ii) A (Biceps) relaxes; as B (Triceps) contracts;

 (b) Hinge joint;

 (c) D – Olecranon process; E – Ulna, F - Radius.

1. (a)

Genotype Rr X rr ;

Gametes R r r r

Offspring Rr Rr rr rr

(b) Incomplete;

(c) (i) Ribonucleic acid; Rej. RNA

 (ii) Has uracil base

 (iii) Three (3);

 Reason – Has three codons.

1. (a) X – Villas

 Y – Lacteal

(b) X – Increase surface area for absorption;

 Y – Absorption of fatty acids and glycerol;

(c) Digestion;

 Absorption of end products of digestion;

(d) – Produce bile juice which contain bile salts for emulsification of fat/bile salts provide

 Alkaline medium suitable for enzymes present in pancreatic juice;

(e) Produce hormones insulin and glycogen;

 Reject of one hormone is mentioned

6. (a) ✓ Has numerous alveoli; that provide large surface area for efficient gaseous exchange;

* Epithelial lining between alveoli wall and blood capillaries is thin; to provide a shorter diffusion distance for easy gaseous exchange;
* It is highly supplied with blood capillaries; that transport oxygen and carbon (IV) oxide to and from the body tissues respectively;
* Lungs are covered with pleural membrane; which is gas tight thus changes in pressure within the lungs can occur without external interference;
* Lungs is spongy & has numerous alveoli; that accumulate large volume of gases.

 (b) Opening

* In the guard cells there are chloroplasts; which carry out photosynthesis in the presence of light;
* During the day glucose is produced in the guard cells; this increases osmotic pressure; compared to the neighboring epidermal; water is drawn from the epidermal cell cells into the guard cells by osmosis; their turgidity increases;
* The inner walls of guards cells are thicker than the other wall; so outer walls stretch more than the inner walls causing guard cells to bulge outwards; causing stomata to open;

Closing

* During the night there is no light; no photosynthesis takes place in the guard cells; Glucose in the guard cells is converted into starch. This lowers the osmotic pressure of the guard cells than the neighboring cells;
* Water is then drawn from the guard cells by osmosis into the epidermal cells making them to be flaccid
* Thinner outer wall shrink and the curvature of the thicker inner wall reduces; the stomata close;