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2011 Past GCE Advanced Level Biology Paper 2

June 2011

1. (a) Describe the Watson and Crick structure of DNA.

(b) Give five structural differences between DNA and RNA

(c) Explain the following terms as applied in DNA replication: (i) Template (ii) Semi-conservative replication (iii) Continuous replication (iv) Discontinuous replication (7, 5, 2, 2, 2,2 mks)

2. (a) Define the following terms: (i) Excretion (ii) Osmoregulation
(b) (i) State the waste products of metabolism in vertebrates.

(ii) Give their origin and

(iii) List the structures responsible for their elimination

3. (a) What is tissue respiration?

(b) Tissue respiration is characterized by aerobic and anaerobic processes. List the processes, indicating which is anaerobic and which is aerobic

(c) Outline the biochemical pathways by which energy is released from glucose in anaerobic conditions.

4. (a) Using suitable examples, differentiate between the following:

(i) Antigen and antibody (ii) Active and passive immunity (iii) Natural and artificial immunity

(iv) Endocrine and exocrine glands.

(b) (i) What role is played by phagocytes and lymphocytes in defending the body against pathogens?

(ii) Explain why some people suffer from allergies. (8,12mks)

5. (a) Give an illustrative account of tissue fluid and lymph formation
(b)How do these fluids differ from and resemble blood?

(c)a person cuts his foot and wound goes septic. Within .a short time his groin hurls. What explanation Can be given to his pain ? (8,12 mrks)

6(a) Using specific examples differentiate between the following: (i) Ecosystem and habitat (ii) Population and community (iii) Gross primary productivity and net primary productivity

(b) What is the role of bacteria in the cycling of nitrogen in the ecosystem? (12, 8mks)

7. (a) What are the characteristic properties of hormones?

(b) Using specific examples of hormones, briefly explain how hormones enter their target cells and exert their effects.

(c) Explain the roles of the following hormones in growth and development: (i) Thyroxin (ii) Growth hormone (iii) Juvenile hormone (4, 8, 8mks)

8. Using suitable examples, differentiate between the following:

(i) Genotype and phenotype

(ii) Complete dominance and co-dominance

(iii) Gene and allele

(iv) Homologous and homozygous -

(b) The gene for bleeder's disease, haemophilia, is sex linked. The gene js recessive. Choosing suitable symbols, write down all possible genotypes for a man and a woman.

(c) A couple, both normal, have a haemophilic child. Explain how this can happen and what must be the sex of the child. (10,5, 5mks)