

June 2004

1. (a) Describe how plants arise by asexual reproduction

(b) Which of the following types of organisms do you expect to exhibit the greatest genetic variability and why?

- (i) Sexually reproducing
- (ii) Asexually reproducing
- (iii) Self-fertilising

2.(a) What is meant by;

- (i) Homeostasis and
- (ii) Osmoregulation

(b) Explain the part played by each of the following in homeostasis.

- (i) Insulin and glucagon
- (ii) Antidiuretic hormone
- (iii) Fibrinogen

3. (a) Make a large fully labelled diagram of the mammalian skin as-seen in vertical section.

(a) Explain how the skin is adapted to perform its functions. (8,12 mks)

4. (a) Heredity is always associated with ■

- (i) Cell nucleus
- (ii) chromosomes and
- (iii) DNA. Describe in each case an evidence to support this.

(b) (i) What are the principal requirements of genetic materials.

(ii) How does the DNA molecule satisfy such requirements?

5. (a) Define species.

(b) Briefly account for the appearance of new species in a given population. Use specific examples to illustrate your answer,

(c) Explain why closely related species may be unable to interbreed successfully. (4,12, 4 mks)

6. (a) State the different types of gas exchange systems in mammals.

(b) With the aid of diagrams, describe how the lungs function in ventilation,

(c) How is this ventilation controlled?

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7. (a) Make a labelled diagram of the chloroplast as seen under the electron microscope

(b) Name four photosynthetic pigments in plants^

(c) Describe the part played by chlorophyll in the light stage of photosynthesis.

(8, 4, 8 mks)

8. (a) Make a large fully labelled drawing to show the structure of a mammalian heart.

(b)(i) What do you understand by the cardiac cycle

(ii) How is the cardiac cycle brought about?

(c) State how a continuous circulation of blood is maintained in a mammal.