2021

(July)

ZOOLOGY

(Honours)

EIGHTH PAPER

(Developmental Biology, Environmental Biology and Biotechnology)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. **1** and *any* **four** from the rest

1. Answer any *three* of the following : 4×3=12

(a) What are morphogenetic movements? Explain invagination, epiboly and involution, with the aid of suitable diagrams.

(b) What are birth defects? List the major causative factors along with examples of the corresponding defects.

(c) Briefly describe the various harmful effects of acid rain.

(d) Briefly describe the important physical, climatic and biological features of desert biome.

(e) Describe in brief the type II restriction enzymes and how they can be used in gene cloning.

2. Briefly explain the factors that determine the patterns of cleavage. Explain with the help of diagrams the radial cleavage, rotational cleavage and superficial cleavage. 2+3+3+3=11

3. What are foetal membranes? With the aid of illustrations, explain the structure and functions of the different types of foetal membranes in mammals. 1+6+4=11

4. *(a)* State and explain Liebig's law of minimum. 4

(b) Explain with the help of an illustration the workings of the nitrogen cycle. Add a note on the significance of the cycle. 5+2=7

5. *(a)* Name the common types of ozone depleting chemicals. Explain the mechanism of how CFCs cause ozone depletion. Discuss the health and environmental effects of ozone depletion. 1½+2½+3=7

(b) With the help of an illustration, explain the process and effects of bio-magnification in an ecosystem. 4

6. *(a)* With the help of a diagram, explain the steps involved in the construction of a genomic library. What are the uses of a genomic library? 5+2=7

(b) With the help of an illustration and an example, explain the important features of a plasmid cloning vector. 1+3=4

7. *(a)* With the help of a diagram, explain the principle and the various steps involved in PCR. Mention the different applications of this technique. 1+4+2=7

(b) Explain the general steps involved in the process of a primary ecological succession. 4

8. Write notes on any *two* of the following : 5½×2=11

(a) Development and differentiation of retina

(b) Types of biological indicators and their usefulness

(c) Principle and process of regeneration in an invertebrate

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