

This question paper contains 4+2 printed pages]

CODE : FS-17

ENVIRONMENTAL SCIENCES

Time : 3 Hours

Maximum Marks : 200

- Note* :— (i) Attempt any *five* questions including Q. numbers 1 and 5 which are compulsory. Minimum of two questions including compulsory shall be attempted from each part. Be brief and to the point. Parts of the same question must be answered together and not to be attempted in between the answers to other questions.
- (ii) Parts of same questions must be attempted together and not to be attempted in between the answers to other questions.

P.T.O.

Part I

1. Write short notes on the following :
 - (a) The theories of 'Origin of Life on Earth'. 8
 - (b) Main features of taxonomic classification of species. 8
 - (c) 'Ecological niche' with examples. 8
 - (d) Types of forests and agro-forests in India. 8
 - (e) Main features of 'Green revolution'. 8
2. (a) Explain with examples the morpho-physiological and biochemical adaptation mechanisms in xerophytes and halophytes. 15
- (b) Explain the physicochemical factors affecting the environmental fate of microorganisms. 15

- (c) Describe with examples the 'Adaptive radiation' and causes of historical extinction of birds and mammals. 10
3. (a) Define conventional and non-conventional sources of energy. Give examples under each category and their contribution to total energy in world and India. 15
- (b) What is 'blue', 'green' and 'grey' water ? Give details of their abundance in India. 15
- (c) Describe the impact of climate change on ecosystems. 10
4. (a) Write a note on 'Ecosystem Services' with example for each type of service. 20

- (b) Differentiate between minerals and metals. List the states of India with their major source of metals and minerals. 20

Part II

5. Write short notes on the following :
- (a) Characteristics of greenhouse gases 8
 - (b) Bio-magnification 8
 - (c) Carbon cycle 8
 - (d) Atmospheric lapse rates 8
 - (e) Physicochemical properties of water and its unique characteristics. 8
6. (a) Describe the heavy metal pollutants and their environmental impacts. 15

- (b) Write a note on persistent organic pollutants and their impacts on environment. 10
- (c) Describe earth's atmosphere and how the atmospheric gas composition has changed during earth's evolution till today. 15
7. (a) Write a note on macro and micro-nutrients of plants in soil and change in their availability with pH and type of soil. 15
- (b) Describe earth's different layers from its core and explain the 'Rock cycle'. 15
- (c) Describe 'continental drift', 'ocean ridges' and 'tectonic plate movement'. Briefly mention the factors contributing to them. 10

8. Write short notes on any *two* :
- (a) 'Hydrological cycle' and 'environmental flows'. 20
 - (b) Describe 'Gibbs energy' and apply the Gibbs energy criteria for spontaneous change with examples. 20
 - (c) Modes of safe destruction of cyanides, aflatoxins and halogenated compounds. 20