

## **Biology 2006 (Delhi)**

### **General instructions:**

1. This question paper consists of four Sections A, B, C and D. Section A contains 5 questions of 1 mark each, Section B is of 10 questions of 2 marks each. Section C is of 10 questions of 3 marks each and Section D is of 3 questions of five marks each.
2. All questions are compulsory.
3. There is no overall choice. However, an internal choice has been provided in one question of 2 marks, one question of 3 marks and three questions of 5 marks weightage. Attempt only one of the choices in such questions.
4. Question numbers 1 to 5 are to be answered in one word Or one sentence each.
5. Question numbers 6 to 15 are to be answered in approximately 20-30 words each.
6. Question numbers 16 to 25 are to be answered in approximately 30- 50 words each.
7. Question numbers 26 to 28 are to be answered in approximately 80— 120 words each.

**Q. 1.** What prevents collapsing of our trachea during breathing? **(1)**

**Q. 2.** What advantage does the sea anemone get in the sea anemone-hermit crab facultative mutualism? Give an alternative term for this kind of mutualism. **(1)**

**Q. 3.** Name the nitrogenous waste excreted in the larval and adult stages of frog respectively. **(1)**

**Q. 4.** In a wheat field, some broad-leaved weeds were found by a farmer. Which phytohormone can be used to eradicate them? **(1)**

**Q. 5.** Correct the statement given below with respect to brazzein:  
"Brazzein is a high calorie carbohydrate."

### **SECTION - B**

**Q. 6.** What is reverse osmosis? Give its one application. **(2)**

**Q. 7.** Which two heart sounds are heard through the stethoscope when placed on the chest? When are these sounds produced respectively? **(2)**

**Q. 8.** How is polyspermy prevented in humans? **(2)**

**Q. 9.** Write the full form of ELISA? Give example of the clinical application of ELISA test. **(2)**

**Q. 10.** What is fermentation? Name any two organic compounds produced in this process. **(2)**

**Or**

What is glycolysis? Name the two monosaccharides which readily enter the glycolytic pathway. **(2)**

**Q. 11.** Draw a diagrammatic sketch of the microscopic view of a mammalian sperm and label any four parts in it. **(2)**

**Q. 12.** Name the location and function of Meibomian glands in the human eye. **(2)**

**Q. 13.** What would happen to the successive trophic levels in the pyramid of energy if the rate of reproduction of phytoplankton was slowed down? Suggest two factors, which could cause such a reduction in phytoplankton reproduction. **(2)**

**Q. 14.** What is cryopreservation? Give its one use. **(2)**  
Commercial significance of cryopreservation is related to preservation of fishes, meat and other foods.

**Q. 15.** What is meant by total fertility rate? How does it differ from replacement level? **(2)**

### **SECTION - C**

**Q. 16.** What is agamospermy? How is agamospermy different from parthenogenesis and parthenocarp? **(3)**

**Q. 17.**

- i. How can haploid plants be raised in the laboratory?
- ii. Name the plant first used in India to produce haploid plants.
- iii. Can haploid plants raise their own progeny? Give reason. **(3)**

**Q. 18.** What is the law of limiting factors? How would the rate of photosynthesis be affected if the soil water becomes limiting? Explain. **(3)**

**Q. 19.** Give information as asked about the following mineral nutrients in plants: **(3)**

- a. Iron:
  - i. it is a constituent of—,
  - ii. its one typical deficiency symptom.
- b. Zinc:
  - i. the group of enzymes it activates,
  - ii. it is needed for the synthesis of -.
- c. Phosphorus:
  - i. the form in which it is absorbed from the soil,
  - ii. its deficiency effect on seed germination.

**Q. 20.** What is the role of calcium ions, troponin and F-Actin during contraction in striated muscles of humans? **(3)**

**Or**

Explain giving one example of each, the three types of joints in human skeleton, based on the capacity of movement. **(3)**

**Q. 21.** A patient was complaining of frequent urination, excessive thirst, hunger, and tiredness. His fasting blood glucose level was found higher than 130 mg/dl on two occasions. **(3)**

- i. Name the disease.
- ii. Give the root cause of this disease.
- iii. Explain why the blood glucose level is higher than '130 mg/dl.

**Q. 22.** Name and explain any three adaptations of mangroves to the conditions prevailing in the Sunderbans (West Bengal) ` **(3)**

**Q. 23.** What is eutrophication" Explain its consequences on the life of plants and animals living in such waters. Why is oxygen depletion in a eutrophicated water-body faster at night than during the day? **(3)**

**Q. 24.**

- i. What is a vaccine. Give an example of a vaccine produced by recombinant DNA technology?
- ii. Name the disease against which DTP vaccination develops immunity. **(3)**

**Q. 25.** Define senescence Explain the 'programmed senescence theory' of ageing. **(3)**

#### **SECTION - D**

**Q. 26.** Explain the process of Crassulacean acid metabolism. How is it advantageous to plants? **(4)**

**Or**

Explain the major steps in Krebs cycle. Why is this cycle also called citric acid cycle?

**Q. 27.** What is sustainable agriculture? Explain the contribution of biopesticides and biofertilisers in sustainable agriculture. OR **(5)**

What is electrocardiography? What is meant by P-Q interval and S -T interval in electrocardiography? Mention two medical applications of this technique. **(5)**

**Q. 28.**

- i. Draw a section of the microscopic structure of human retina and label any six parts in it.
- ii. Name the structure that determines the eye colour in humans. What is the normal function of this structure?
- iii. Name the point of sharpest vision and the point of no vision in human eye. **(5)**

**Or**

- i. Draw the basic structure of a neural synapse and label the following parts in it Presynaptic cell, Postsynaptic cell, Vesicles, Neurotransmitter, Receptor, Synaptic cleft.
- ii. Give any two differences between chemical synapses and electrical synapses. **(5)**