

CBSE
Class XII Biology (Theory)
Board Paper 2018 All India (Set 3)

Time allowed: 3 hrs**Maximum Marks: 70****General Instructions:**

1. There are total **26** questions and five sections in the question paper.
All questions are compulsory.
2. *Section A* contains questions number **1 to 5**; very short answer type questions of **1** mark each.
3. *Section B* contains questions number **6 to 10**, short-answer type **I** questions of **2** marks each.
4. *Section C* contains questions number **11 to 22**, short answer type **II** questions of **3** marks each.
5. *Section D* contains question number **23**, value based question of **4** marks.
6. *Section E* contains questions number **24 to 26**, long-answer type questions of **5** marks each.
7. There is no overall choice in the question paper; however, an internal choice is provided in one question of **2** marks, one question of **3** marks and all the three questions of **5** marks. In these questions, an examinee is to attempt any of the two given alternatives.

SECTION A

1. How do cytokine barriers provide innate immunity in humans? [1]
2. Write the dual purpose served by deoxyribonucleoside triphosphates in polymerisation. [1]
3. Write the names of the following : [1]
(a) A 15 mya primate that was ape-like
(b) A 2 mya primate that lived in East African grasslands
4. Mention the chemical change that proinsulin undergoes, to be able to act as mature insulin. [1]
5. Name two diseases whose spread can be controlled by the eradication of *Aedes* mosquitoes. [1]

SECTION B

6. How did a citizen group called Friends of Arcata Marsh, Arcata, California, USA, help to improve water quality of the marshland using Integrated Waste Water Treatment? Explain in four steps. [2]
7. Your advice is sought to improve the nitrogen content of the soil to be used for cultivation of a non-leguminous terrestrial crop. [2]
(a) Recommend two microbes that can enrich the soil with nitrogen.
(b) Why do leguminous crops not require such enrichment of the soil?
8. You have obtained a high yielding variety of tomato. Name and explain the procedure that ensures retention of the desired characteristics repeatedly in large populations of future generations of the tomato crop. [2]
9.
(a) Name the source plant of heroin drug. How is it obtained from the plant?
(b) Write the effects of heroin on the human body. [2]
10. With the help of an algebraic equation, how did Hardy-Weinberg explain that in a given population the frequency of occurrence of alleles of a gene is supposed to remain the same through generations? [2]

OR

Although a prokaryotic cell has no defined nucleus, yet DNA is not scattered throughout the cell. Explain.

SECTION C**11.**

- (a) Differentiate between analogous and homologous structures.
- (b) Select and write analogous structures from the list given below: [3]
 - (i) Wings of butterfly and birds.
 - (ii) Vertebrate heads
 - (iii) Tendrils of bougainvillea and cucurbita
 - (iv) Tubers of sweet potato and potato

12. How has the use of *Agrobacterium* as vectors helped in controlling *Meloidogyne incognita* infestation in tobacco plants? Explain in correct sequence. [3]

13.

- (a) "India has greater ecosystem diversity than Norway". Do you agree with the statement? Give reasons in support of your answer.
- (b) Write the difference between genetic biodiversity and species biodiversity that exists at all the levels of biological organization. [3]

OR

Explain the effect on the characteristics of a river when urban sewage is discharged into it. [3]

14. Explain the mechanism of 'sex determination' in birds. How does it differ from that of human beings? [3]

15. Explain out-breeding, out-crossing and cross-breeding practices in animal husbandry. [3]

16.

- (a) Organic farmers prefer biological control of diseases and pests to the use of chemicals for the same purpose. Justify.
- (b) Give an example of a bacterium, a fungus and an insect that are used as biocontrol agents. [3]

17.

- (a) How has the development of bioreactor helped biotechnology?
- (b) Name the most commonly used bioreactor and describe its working. [3]

18. Explain the roles of the following with the help of an example each in recombinant DNA technology: [3]

- (a) Restriction Enzymes
- (b) Plasmids

19. Differentiate between parthenocarpy and parthenogenesis. Give one example of each. [3]

- 20.** Medically it is advised to all young mothers that breastfeeding is the best for their newborn babies. Do you agree? Give reasons in support of your answer.[3]
- 21.** Draw a diagram of a mature human sperm. Label any three parts and write their functions. [3]
- 22.**
- (a) Expand VNTR and describe its role in DNA fingerprinting
 - (b) List any two applications of DNA fingerprinting technique. [3]

SECTION D

- 23.** Looking at the deteriorating air quality because of air pollution in many cities of the country, the citizens are very much worried and concerned about their health. The doctors have declared health emergency in the cities where the air quality is very severely poor. [4]
- (a) Mention any two major causes of air pollution.
 - (b) Write any two harmful effects of air pollution to plants and humans.
 - (c) As a captain of your school Eco-club, suggest any two programmes you would plan to organise in the school so as to bring awareness among the students on how to check air pollution in and around the school.

SECTION E**24.**

- (a) Write the scientific name of the organism Thomas Hunt Morgan and his colleagues worked with for their experiments. Explain the correlation between linkage and recombination with respect to genes as studied by them.
- (b) How did Sturtevant explain gene mapping while working with Morgan? [5]

OR

- (a) State the 'Central dogma' as proposed by Francis Crick. Are there any exceptions to it? Support your answer with a reason and an example.
- (b) Explain how the biochemical characterization (nature) of 'Transforming Principle' was determined, which was not defined, from Griffith's experiments. [5]

25.

- (a) Following are the responses of different animals to various abiotic factors. Describe each one with the help of an example.
- (i) Regulate
 - (ii) Conform
 - (iii) Migrate
 - (iv) Suspend
- (b) If 8 individuals in a population of 80 butterflies die in a week, calculate the death rate of population of butterflies during that period. [5]

OR

- (a) What is a trophic level in an ecosystem? What is 'standing crop' with reference to it?
- (b) Explain the role of the 'first trophic level' in an ecosystem.
- (c) How is the detritus food chain connected with the grazing food chain in a natural ecosystem? [5]

26.

- (a) Describe any two devices in a flowering plant which prevent both autogamy and geitonogamy.
- (b) Explain the events up to double fertilisation after the pollen tube enters one of the synergids in an ovule of an angiosperm. [5]

OR

- (a) Explain menstrual cycle in human females.
- (b) How can the scientific understanding of the menstrual cycle of human females help as a contraceptive measure? [5]