Candidates must write the Code on the title page of the answer-book.

- कृपया जाँच कर लें कि इस प्रश्न-पत्र में पुनर्द्रित पृष्ठ 8 हैं।
- प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए कोड नंबर को छात्र उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें।
- कृपया जाँच कर लें कि इस प्रश्न-पत्र में 30 प्रश्न हैं।
- कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, प्रश्न का क्रमांक अवश्य लिखें।
- इस प्रश्न-पत्र को पढ़ने के लिए 15 मिनट का समय दिया गया है। प्रश्न-पत्र का वितरण पूर्वांग में 10.15 बजे किया जाएगा। 10.15 बजे से 10.30 बजे तक छात्र केवल प्रश्न-पत्र को पढ़ें और इस अवधि के दौरान उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखें।
- Please check that this question paper contains 8 printed pages.
- Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains 30 questions.
- Please write down the Serial Number of the question before attempting it.
- 15 minutes time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the students will read the question paper only and will not write any answer on the answer-book during this period.

बीय विज्ञान (सैद्धांतिक)

BIOLOGY (Theory)

निर्धारित समय : 3 घंटे

Time allowed : 3 hours
General Instructions:

(i) All questions are compulsory.

(ii) This question paper consists of four Sections A, B, C and D. Section A contains 8 questions of one mark each, Section B is of 10 questions of two marks each, Section C is of 9 questions of three marks each and Section D is of 3 questions of five marks each.

(iii) There is no overall choice. However, an internal choice has been provided in one question of 2 marks, one question of 3 marks and two questions of 5 marks weightage. A student has to attempt only one of the alternatives in such questions.

(iv) Wherever necessary, the diagrams drawn should be neat and properly labelled.

खण्ड A
SECTION A

1. अपने खाद्य शृंखला किन-किन की बनी होती है? वे सब अपनी ऊष्मा एवं पोषण आवश्यकताओं की किस प्रकार पूरी करते हैं?

What is a detritus food chain made up of? How do they meet their energy and nutritional requirements?
2. Why are green algae not likely to be found in the deepest strata of the ocean?

3. Name the phenomenon and one bird where the female gamete directly develops into a new organism.

4. When does a human body elicit an anamnestic response?

5. Name any two diseases the 'Himgiri' variety of wheat is resistant to.

6. State the role of transposons in silencing of mRNA in eukaryotic cells.

7. Name the type of biodiversity represented by the following:
   (i) 1000 varieties of mangoes in India.
   (ii) Variations in terms of potency and concentration of reserpine in *Rauwolfia vomitoria* growing in different regions of Himalayas.

8. Why is the use of unleaded petrol recommended for motor vehicles equipped with catalytic converters?
SECTION B

9. “It is possible that a species may occupy more than one trophic level in the same ecosystem at the same time.” Explain with the help of one example.

10. What is meant by “alien species” invasion? Name one plant and one animal alien species that are a threat to our Indian native species.

11. Write any four ways used to introduce a desired DNA segment into a bacterial cell in recombinant technology experiments.

12. Why is proinsulin so called? How is insulin different from it?

13. Differentiate between the two cells enclosed in a mature male gametophyte of an angiosperm.

14. Work out a cross to find the genotype of a tall pea plant. Name the type of cross.

15. Write the Oparin and Haldane’s hypothesis about the origin of life on Earth. How does meteorite analysis favour this hypothesis?
16. When a vaccine for any disease is introduced into the human body, the immune system recognizes it as foreign and responds by producing antibodies. List the events that take place when a vaccine is administered.

OR

17. A person with cuts and bruises following an accident is administered tetanus antitoxin. Why is this done? Give reasons.

18. Name the bacterium responsible for the large holes seen in "Swiss Cheese". What are these holes due to?

SECTION C

19. (a) Explain DNA polymorphism as the basis of genetic mapping of human genome.
(b) State the role of VNTR in DNA fingerprinting.

20. Explain the increase in the numbers of melanic (dark winged) moths in the urban areas of post-industrialisation period in England.

21. Describe how biogas is generated from activated sludge. List the components of biogas.
Write the changes a fertilized ovule undergoes within the ovary in an angiosperm plant.

OR

(a) Draw a diagrammatic sectional view of a human seminiferous tubule, and label Sertoli cells, primary spermatocyte, spermatogonium and spermatozoa in it.

(b) Explain the hormonal regulation of the process of spermatogenesis in humans.

30. प्राकृतिक करण की प्रक्रिया द्वारा हार्डी-वीनबर्ग संतुलन किस प्रकार प्रभावित होता है?

अथवा

(a) कोई एक उपयुक्त उदाहरण लेकर समझाइए कि मेंडल का स्वतंत्र अपव्युत्क्रम का प्रयोग क्या होता है?

(b) इसी नियम के संदर्भ में ड्रोसोफिला में बैंगनात प्रतिरूप में होने वाले विचलन को मापने के किस प्रकार उपयोग किया जा सकता है?

How does the process of natural selection affect Hardy-Weinberg equilibrium? Explain. List the other four factors that disturb the equilibrium.

OR

(a) Explain Mendel’s law of independent assortment by taking a suitable example.

(b) How did Morgan show the deviation in inheritance pattern in Drosophila with respect to this law?