

Series : AAB3/1



SET-2

प्रश्न-पत्र कोड 57/1/2
Q.P. Code

रोल नं.

Roll No.

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परीक्षार्थी प्रश्न-पत्र कोड को उत्तर-पुस्तिका के मुख-पृष्ठ पर अवश्य लिखें।

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

- कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ 12 हैं।
- प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए प्रश्न-पत्र कोड को छात्र उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें।
- कृपया जाँच कर लें कि इस प्रश्न-पत्र में 13 प्रश्न हैं।
- कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, उत्तर-पुस्तिका में प्रश्न का क्रमांक अवश्य लिखें।
- इस प्रश्न-पत्र को पढ़ने के लिए 15 मिनट का समय दिया गया है। प्रश्न-पत्र का वितरण पूर्वाह्न में 10.15 बजे किया जाएगा। 10.15 बजे से 10.30 बजे तक छात्र केवल प्रश्न-पत्र को पढ़ेंगे और इस अवधि के दौरान वे उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखेंगे।
- Please check that this question paper contains 12 printed pages.
- Q.P. Code 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 13 questions.
- **Please write down the Serial Number of the question in the answer-book before attempting it.**
- 15 minute 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 candidates will read the question paper only and will not write any answer on the answer-book during this period.



जीव विज्ञान (सैद्धान्तिक) BIOLOGY (Theory)

निर्धारित समय : 2 घण्टे

Time allowed : 2 hours

अधिकतम अंक : 35

Maximum Marks : 35

57/1/2

280B

1

P.T.O.

General Instructions :

- (i) *This question paper contains **13** questions. All questions are compulsory.*
- (ii) *The question paper has **three** Sections – **Section A, B** and **C**.*
- (iii) ***Section – A** has **6** questions of **2** marks each. **Section – B** has **6** questions of **3** marks each, and **Section – C** has a case-based question of **5** marks.*
- (iv) *There is no overall choice. However, internal choices have been provided in some questions. A candidate has to attempt **only one** of the alternatives in such questions.*
- (v) *Wherever necessary, neat and properly labelled diagrams should be drawn.*

SECTION – A

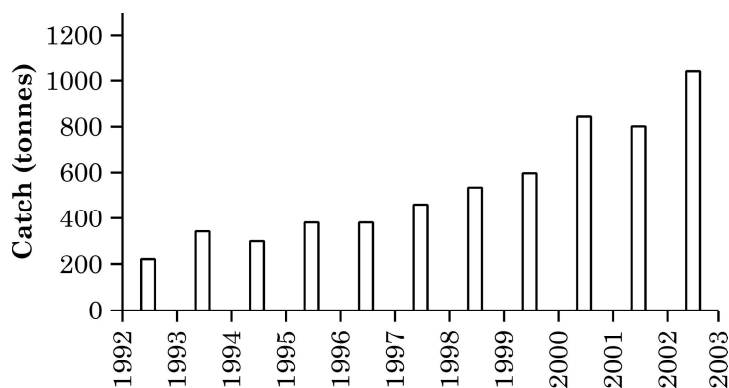
1. State the impact of constant mechanical agitation and pumping of air in the aeration tank on the sewage during the biological treatment. **2**

OR

- (a) Cattle excreta is important source for producing a domestic fuel. Name the fuel and write its main components.
- (b) Write the biological process that is responsible for the production of this fuel.
2. Mention the two types of acquired immune responses present in our body. Give one major role of each. **2**



3. The histogram given below representing the data for annual shark harvest in the great barrier reef / coral reef located on the east coast of Queensland, Australia. Study the histogram and answer the questions that follow.



Source : Fijisharkdiving.blogspot.com

- (a) Write your interpretation of the data given.
- (b) Write the impact on the biodiversity of the area that you can interpret on the basis of given data. 2

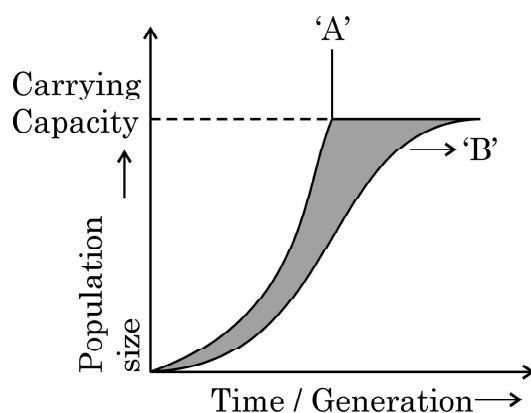
OR

“Stability of community depends upon its species richness.” How did David Tilman show this experimentally ?

4. Name the source organism (scientific name) that produces statins. Mention its use in medical field and how does it act. 2
5. (a) Give an example of viral biocontrol agent.
- (b) Why are they considered to be desirable when an ecologically sensitive area is being treated ? 2



6. Study the graph given below, showing the population growth curves 'A' and 'B' respectively. Answer the following questions :



- (a) What is 'Carrying Capacity' in respect of Curve 'B' indicative of ?
- (b) Mention the action of possible natural forces that could have lead to curve 'B'.

2

SECTION - B

7. (a) What does the equation $\frac{dN}{dt} = rN$ express in terms of population growth ?
 - (b) Write the significance of 'r' in a population survey.
8. (i) State the role of a selectable marker in r-DNA technology.
 - (ii) Name one such selectable marker which is considered to be useful for E.coli.
 - (iii) Give one reason why is it considered to be a useful marker.

3

3

OR

What are plasmids ? How are they different from cloning vectors ? Give one example each for a viral and a bacterial cloning vector.

9. Explain giving reason the action plan followed by organic farmers that support their key belief "biodiversity furthers health of crop lands".

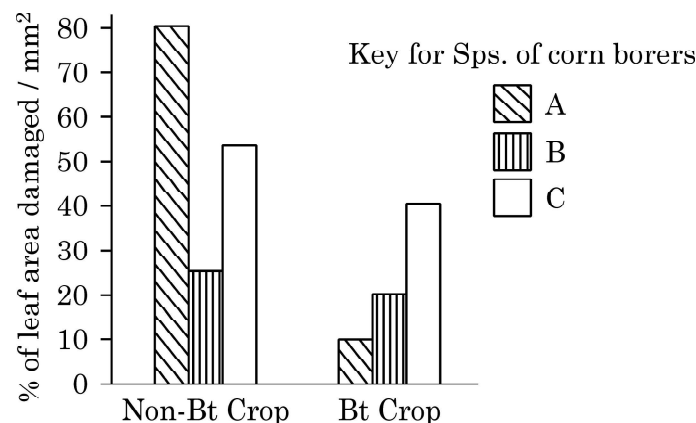
3



10. Bio-diversification of life started to occur almost 3 billion years ago. Since then new species have been evolving and then disappearing en masse from earth.
- How many episodes of mass extinctions of species have already taken place and which one is in progress in the current era ?
 - How is current episode in progress different from the previous episodes and why ? Explain.
- 3
11. (i) Name three molecular diagnostic techniques for diagnosis of a disease.
- (ii) List three advantages of molecular diagnostic techniques over conventional method of diagnosis.
- 3
12. Enumerate the main sources of bio-fertilisers giving one example of each.
- 3

SECTION – C (Case Based)

13. To save the crop plant from the attack of various insect pests the biotechnologists have developed many pest resistant plants. One such example is Bt corn plant. In this plant 'cry' genes were introduced which produces cry-proteins in the plant that has toxic effect on the pest (corn borer). Thus saves the corn plant from the attack of the corn borer. An experimental field study was conducted by the scientists to see the efficacy of the Bt corn plant against the attack of corn borers. Three different species of corn borers namely 'A', 'B', 'C' were collected and were independently fed on non Bt corn plants and Bt corn plants separately for the same period. The extent of the damage caused to the leaf area of the plant was observed and noted down. With the help of the observations and data collected the following bar graph was plotted. Study the graph and answer the questions that follow.



-
- (i) Identify the species of the corn borer that was most successfully controlled by Bt corn plant. Give appropriate reason for your inference.
- (ii) Identify the species of the corn borers which shows least impact of toxin produced by Bt genes.
- (iii) What would be your advise as a Scientist, to the farmers for growing this particular Bt corn variety in the area which is infested by species-‘B’ of corn borers ?
- (iv) Name one Bt gene that encodes protein in corn plants to control corn borers.

5

OR

A gene was identified in a fungus by a research worker in a lab which was considered to be of a great importance in the field of agriculture. As a student of biotechnology, write the steps you would suggest to (i) Isolate this gene of interest from the fungus and (ii) amplify this gene for further experimentation and research.

