

# NAVODAYA VIDYALAYA SAMITI

CLASS: XII

BIOLOGY (044)

PRE BOARD II (2021-22)

Max. Marks 35

Time allowed: 2 hours

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## General Instructions:

- i) All questions are compulsory.
  - ii) The question paper has three sections and 13 questions. All questions are compulsory.
  - 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 student has to attempt only one of the alternatives in such questions.
  - v) Wherever necessary, neat and properly labeled diagrams should be drawn.
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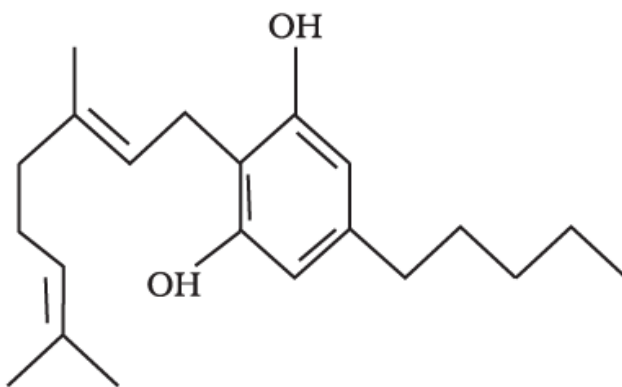
## SECTION/ खंड - A (2 mark each)

1. A farmer while working on his farm was bitten by a poisonous snake. The workers in the farm immediately rushed him to the nearby health centre. The doctor right away gave him an injection to save his life. (a) What did the doctor inject? (b) What kind of immunity it is?
2. A patient admitted in hospital, need an organ transplant from non blood relation donor. Name bioactive agents required during this and source of microbe.?

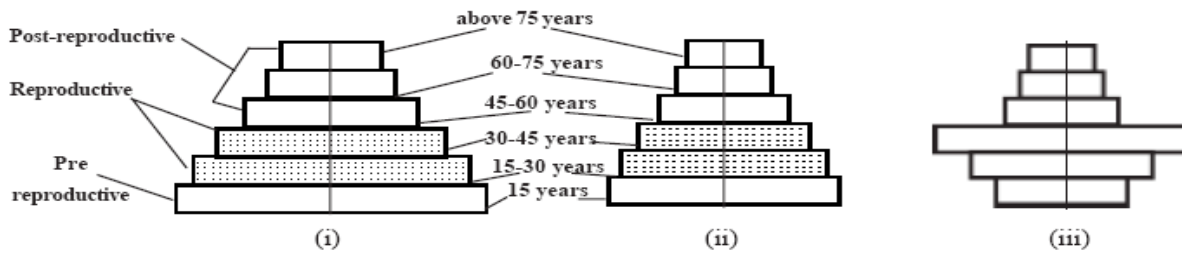
**OR**

A farmer is growing brassica and fruit trees in his farm, He found that they are eaten by the insects larvae. Suggest a holistic approach to control these insects without harming the flora and fauna. Explain with example?

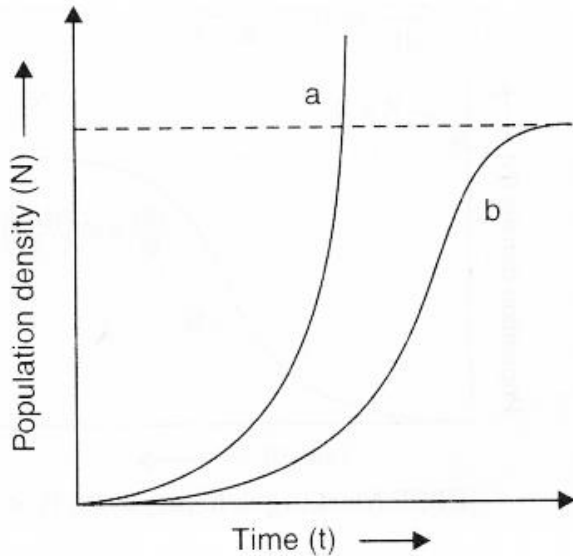
3. Identify the compound chemical structure is shown below. Name the plant from which it is obtained and body system which effects.?



4. Name the microbes that help production of the following products commercially ?:  
 (a) Statin (b) Citric acid (c) Penicillin (d) Butyric acid
5. Study the three representative figures of age pyramid relating to human population given below and answer the following question:  
 (a) Mention the names given to the 3 kinds of age profiles (i), (ii), and (iii). ?  
 (b) Which one of them is ideal for a population and why?



6. In the given below population growth curve,



- What is the status of food and space in the curves (a) and (b)?
- In the absence of the predators, which curve (a) or (b) would appropriately depict the prey population?

**OR**

- In the absence of external source of water, How kangaroo rat meet its water requirements?
- Why many tribes live in the high altitude have a higher red blood cells count than people living in plane area?

**SECTION/ खंड - B (3 mark each)**

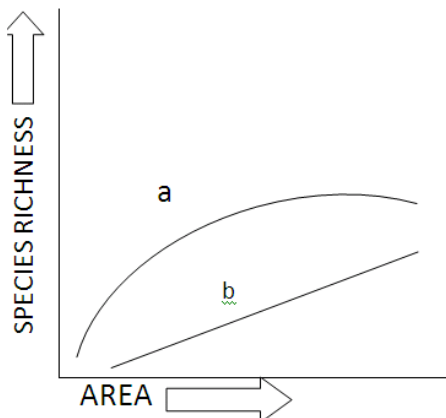
7. How do malignant tumors differ from benign tumor? Name the detection techniques of malignant tumor for early treatment.

**OR**

A person is bite by a Culex female mosquito vector.

- (a) What disease he/she may suffer?
- (b) Which symptoms will help to identify if he/she is suffering from above mentioned disease?

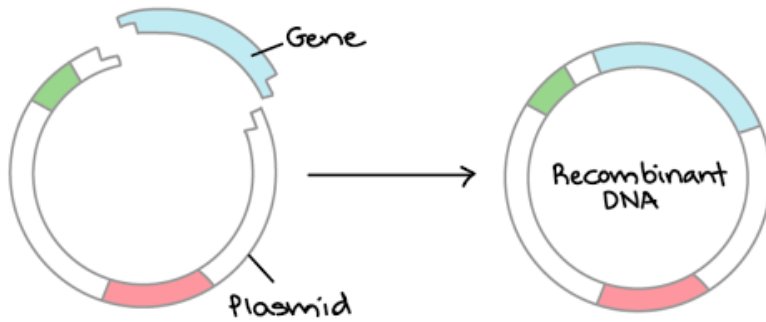
8. (a) Name the type of cells involved in primary and secondary immune response of our body.  
(b) Which among these cells produce antibodies against antigens ?  
(c) Which among these cells are involved in cell mediated immunity?
9. In a biotechnology lab a scientist wants to find the gene of interest from plant cell. Describe the steps up to how he/she isolate gene of interest for the construction of rDNA.
10. 'The Evil Quartet' describes the rates of species extinction due to human activities. (a) Explain how introduction of alien species has led to environmental damage and decline of indigenous species with example?. (b) How is "Sixth extinction" is differ from earlier mass extinction.?
11. The graph below shows species –area relationship.  
(a) Describe a and b.  
(b) How is slope represented? Give the normal range of slope.  
(c) What kind of slope will be observed for frugivorous birds and mammals in a tropical forest?



12. In a bacterial culture some of the colonies produced blue colour in the presence of a chromogenic substrate and some did not due to the presence or absence of an insert (rDNA) in the coding sequence of  $\beta$ -galactosidase.  
(a) Mention the mechanism and the steps involved in the above experiment.  
(b) How is it advantageous over simultaneous plating on two plates having different antibiotics?

**SECTION/ खंड – C (5 mark each)**

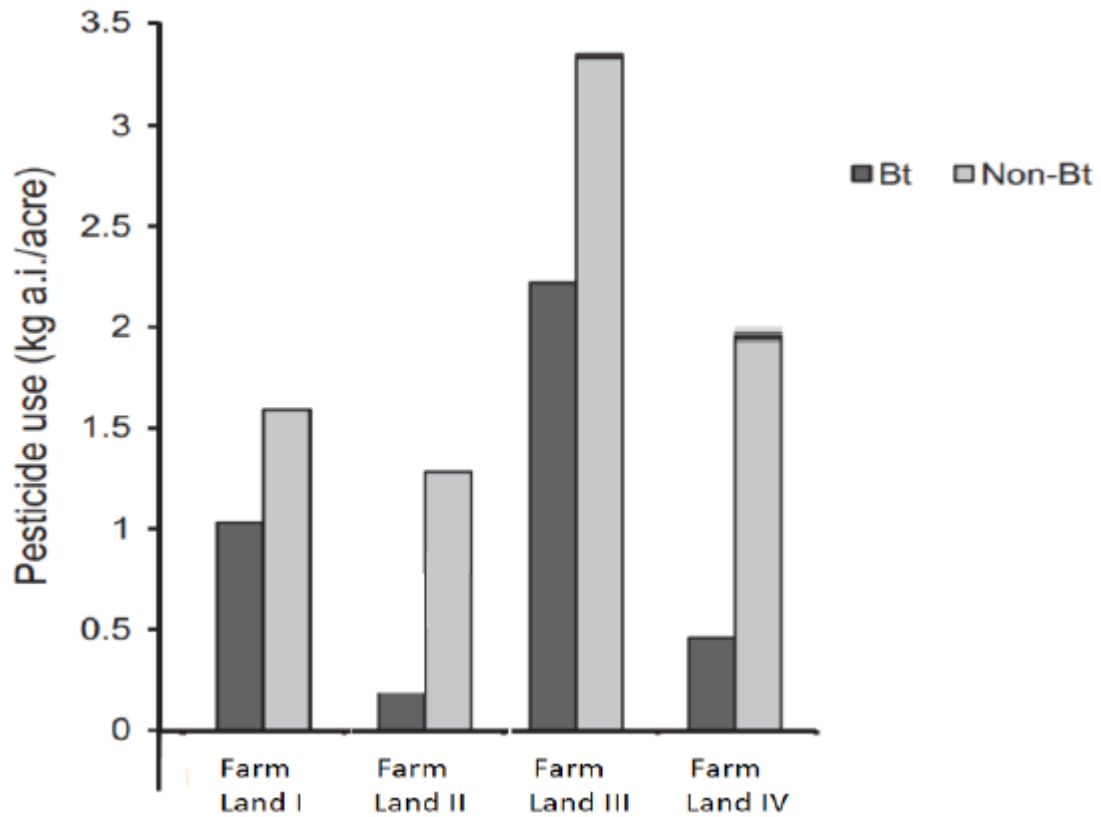
13. Study the given figure some tools are used in recombinant DNA technology all over the world based on these ideas answer the following questions.



- (a) Give the name of the carcinogenic dye which is used to stain gel to make the DNA visible under UV light
- (b) In which technique do we use Taq polymerase enzyme and why?
- (c) Write the palindromic sequence that EcoRI recognises in given DNA.
- (d) Name the enzyme which join sticky ends of two DNA fragments
- (e) What happens when you link alien piece of DNA with above plasmid?

**OR**

GM crops especially Bt crops are known to have higher resistance to pest attacks. To substantiate this an experimental study was conducted in 4 different farmlands growing Bt and non Bt-Cotton crops. The farm lands had the same dimensions, fertility and were under similar climatic conditions. The histogram below shows the usage of pesticides on Bt crops and non-Bt crops in these farm lands,



- (a) Which of the above 4 farm lands has successfully applied the concepts of Biotechnology to show better management practices and use of agrochemicals? If you had to cultivate, which crop would you prefer (Bt or Non- Bt) and why?
- (b) Cotton Bollworms were introduced in another experimental study on the above farm lands wherein no pesticide was used. Explain what effect would a Bt and Non-Bt crop have on the pest.