

CLASS: XII Model Examination – 1 - BIOLOGY

MARKS: 70

DATE: 27.11.19

CODE: 044

Time: 3Hrs

General instructions:

1. There are a total of 27 questions and five sections in the question paper. All questions are compulsory.
2. Section A contains question numbers 1 to 5; multiple choice questions of one mark each.
3. Section B contains question numbers 6 to 12, short answer type I questions of two marks each.
4. Section C contains question numbers 13 to 21, short answer type II questions of three marks each.
5. Section D contains question numbers 22 to 24; case- based short answer type questions of three marks each.
6. Section E contains question numbers 25 to 27, long answer type questions of five marks each.
7. There is no overall choice in the question paper. However, internal choices are provided in two questions of one mark, one question of two marks, two questions of three marks and all three questions of five marks. An examinee is to attempt any one of the questions out of the two given question paper with the same question number.

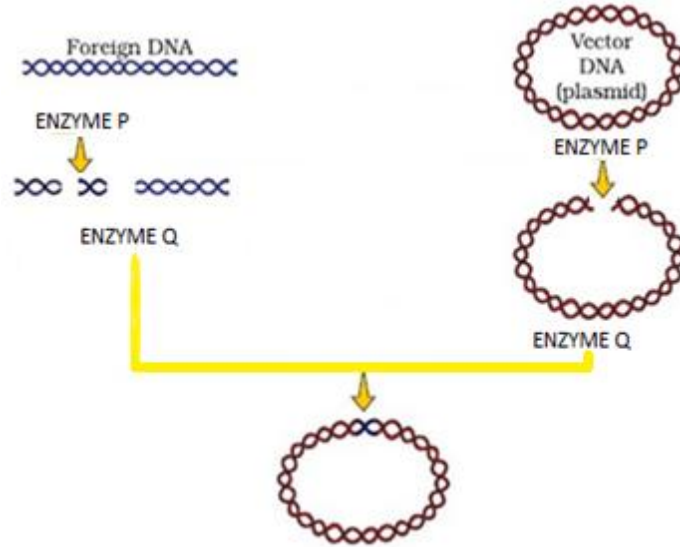
SECTION –A

1. A biotechnologist wanted to create a colony of *E.coli* possessing the plasmid pBR322, sensitive to Tetracycline. Which one of the following restriction sites would he use to ligate a foreign DNA?

- a. Sal I b. Pvu I c. EcoRI d. Hind III

OR

Name the enzymes 'P' and 'Q' that are involved in the processes given below.



- a. Enzyme P-Exonuclease and Enzyme Q-Permease
- b. Enzyme P-Exonuclease and Enzyme Q- Ligase
- c. Enzyme P-Endonuclease and Enzyme Q- Permease
- d. Enzyme P-Restriction endonuclease and Enzyme Q-Ligase

2. The most important cause of biodiversity loss is _____

- a. Over exploitation of economic species
- b. Habitat loss and fragmentation
- c. Invasive species
- d. Breakdown of plant-pollinator relationships

OR

Find the incorrect statement

- a. Gene therapy is a genetic engineering technique used to treat disease at molecular level by replacing defective genes with normal genes.
- b. Calcitonin is a medically useful recombinant product in the treatment of intertility
- c. t toxin is a Biodegradable insecticide obtained from *Bacillis thuringiensis*
- d. Trichoderma sp. is a biocontrol agent for fungal diseases of plants
- e. Totipotency is the potential ability of a cell to develop into a complete plant

3. What is common to the techniques? (i) invitro fertilization (ii) cryo preservation (iii) tissue culture.

- a. All are in situ conservation methods.
- b. All are ex-situ conservation methods.
- c. All require ultra modern equipment and large space.
- d. All are methods of conservation of extinct organisms.

4. In 2005, for each of the 14 million people present in a country, 0.028 were born and 0.008 died during the year. Using exponential equation, the number of people present in 2015 is predicted as _____

- a. 25 millions
- b. 17 millions
- c. 20 millions
- d. 18 millions

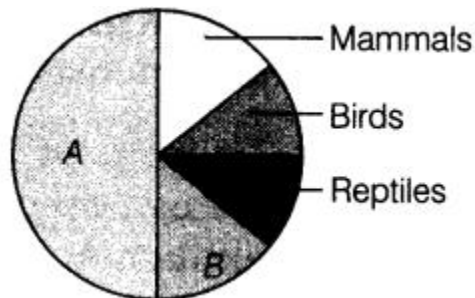
5. Match correctly the following and choose the correct option:

i	Environment protection act	A.	1974
ii	Air prevention and control of pollution act	B.	1987
lii	Water act	C.	1986
iv	Amendment of air act to include noise	D.	1981

SECTION-B

6. "Man can be respiratory as well as secondary consumers." Justify this statement.

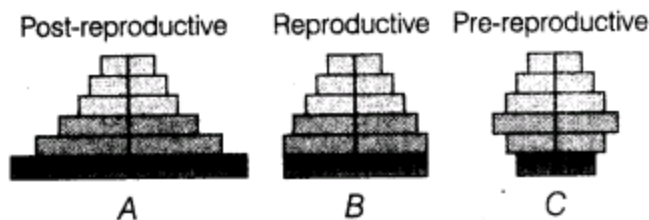
7. Name the unlabelled areas A and B of the pie chart representing the global biodiversity of vertebrates showing their proportionate number of species of major taxa.



8. a. State the role of ligase in biotechnology.

b. What happens when *Meloidegryne incognitia* consumes cells with RNAi Genes?

9. Study the three different age pyramids for human population given below and answer the following questions.



a. Write the names given to each of these age pyramids.

b. Mention the one which is ideal for human population and why?

10. BOD of two samples of water A and B were 120mg/L and 400 mg/L respectively. Which sample is more polluted?

11. Write a difference between net primary productivity and gross productivity.

12. Expand the following: a. cDNA

b. Bt

SECTION-C

13. Suggest and describe a technique to obtain multiple copies of a gene of interest *in vitro*

14. How does β - galactosidase coding sequence act as a selectable maker? Explain. Why is it a preferred selectable marker to antibiotic resistance genes?

15. "A very small sample of tissue or even a drop of blood can help determine paternity ". Provide a scientific explanation to substantiate the statement

16. Predation is usually referred to as a detrimental association. State any three positive roles that a predator plays in an ecosystem.

17. Name the types interaction seen in each of the following examples:

i. *Ascaris* worms living in the intestine of humans

ii. Wasp pollinating fig inflorescence

iii. Clown fish living among the tentacles of sea- anemone

iv. Mycorrhizae living on the roots of higher plants

v. Orchid growing on branch of a mango tree

vi. Disappearance of smaller barnacles when *Balanus* dominated in the coast of Scotland.

18. a. State any two differences between phosphorus and carbon cycles in nature.

b. Write the importance of phosphorus in living organisms.

19. Differentiate between

a. keystone species and endangered species

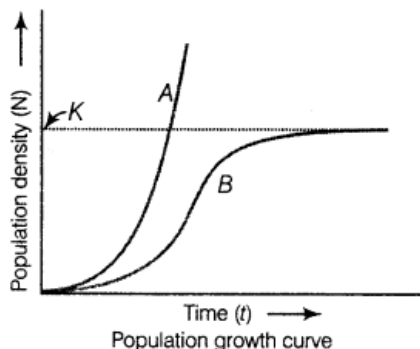
b. genetic diversity and species diversity.

20. '*In- situ*' conservation can help endangered / threatened species. Justify the statement

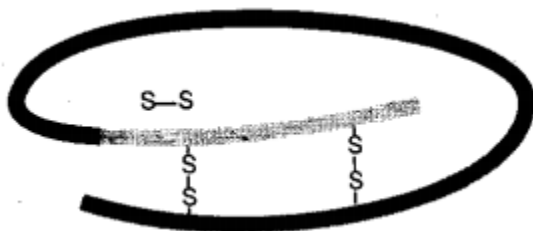
21. What is T_i plasmid? Name the organism where it is found. How does it help in genetic engineering?

SECTION-D

22. Identify the curves A and B shown in the graph given below. List the conditions responsible for growth patterns A and B.



23. Refer to the diagram given below and answer the questions that follow.



i. The diagram shown is insulin or proinsulin, justify.

ii. How is mature insulin synthesized?

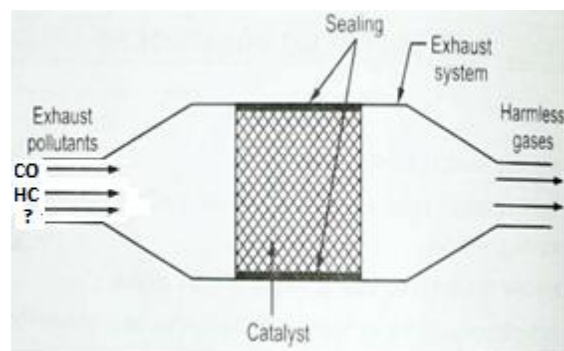
24.

Observe the diagram of the catalytic converter and answer the questions which follow:

a.) Name any two metals used as catalyst in the catalytic converter.

b.) Name the gases that are released after passing the exhaust hydrocarbons through the catalytic converter.

c.) Name the other poisonous gas which is missing (?) in the exhaust pollutant of an automobile in the above diagram?



SECTION-E

25. a. List any three parameters used by ecologist under different situations to measure the population size in a habitat.

b. Mention what do the following stand for in the equation given below.

i. N_{t+1}

ii. B

iii. E

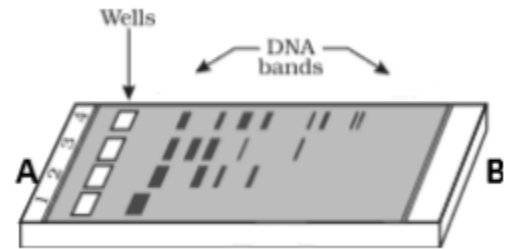
$$N_{t+1} = N_0 + \left[(B+I) - (D+E) \right]$$

Explain the above equation.

OR

Given below is the diagram of agarose gel kept under UV light:

- i. Mention the positive and negative terminals.
- ii. What is the charge carried by DNA molecule and how does it help in its separation?
- iii. How are the separated DNA fragments finally isolated?
- iv. Elaborate the steps involved to visualize the DNA bands.



26. “Indiscriminate human activities have strengthened the greenhouse effect resulting in Global Warming.” Give the relative contribution of various Green House Gases in the form of a pie chart and explain the fate of the energy of sunlight reaching the earth’s surface contributing towards Global Warming.

OR

Given below is a table depicting population interactions between species A and species B.

Type of interaction	Species A	Species B
(a)	(-)	(+)
(b)	(+)	(-)

- i. Name the types of interactions (a) and (b) in the above table.
- ii. Justify giving three reason, how the type of interaction (b) is important in an ecological context.

27. a. With the help of diagrams shows the different steps in the formation of recombinant DNA by action of restriction endonuclease enzyme EcoRI.

b. Name the technique that is used for separating the fragments of DNA cut by restriction endonucleases

OR

The graph shows species – area relationship:

a. if b denotes the relationship on log scale-

- i. Describe a and b.
- ii. How is slope represented? Give the normal range of slope.
- iii. What kind of slope will be observed for frugivorous birds and mammals in a tropical forest?

b. Species diversity of plants (22%) is much less than that of animals (72%). Analyze the reasons for greater diversity of animals as compared to plants.

