CBSE Class 12 Biology 2020 - Set 57-C-3 - Compartment

Question Paper

Conducted by the Central Board of Secondary Education (CBSE)

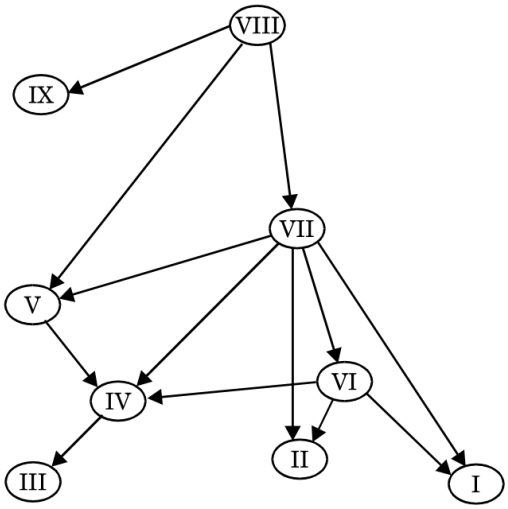
Time Allowed: 3 Hours **Maximum Marks: 70**

General Instructions

(i) This question paper comprises five sections A, B, C, D and E.
(ii) There are 27 questions in the question paper. All questions are compulsory.
(iii) Section A: Questions 1-5 are multiple choice questions carrying 1 mark each.
(iv) Section B: Questions 6-12 are short answer questions type I carrying 2 marks each.
(v) Section C: Questions 13-21 are short answer questions type II carrying 3 marks each.
(vi) Section D: Questions 22-24 are short answer questions type III carrying 3 marks each.
(vii) Section E: Questions 25-27 are long answer questions carrying 5 marks each.
(viii) Answers should be brief and to the point.
(ix) There is no overall choice. An internal choice is provided in two questions of 1 mark, one question of 2 marks, two questions of 3 marks and three questions of 5 marks. Attempt only one alternative in such questions.
(x) Draw neat, proportionate and properly labelled diagrams wherever necessary.
(xi) Follow the separate instructions given with each section and question.

Section A

1. In the illustration given below of a simplified food web on an island, the arrows indicate the direction of energy flow and the Roman numbers indicate species within the food web.



At which trophic level or levels does the species VIII function?

(A) 2nd and 3rd consumer
(B) 1st consumer
(C) Producer
(D) 3rd and 4th consumer

2. Which of the following is **not** a plasmid?

(A) Sal1
(B) YAC
(C) BAC
(D) pBR322

OR

2. Colostrum provides passive immunity to human infants as it contains antibody

(A) IgA
(B) IgM
(C) IgE
(D) IgG

3. The specific site for fertilisation in human female is

(A) Infundibulum
(B) Uterus
(C) Ampulla
(D) Ampullary isthmic junction

OR

3. The hormone that regulates the synthesis and secretion of androgens in human males is

(A) GH
(B) FSH
(C) LH
(D) Prolactin

4. In biotechnology experiments, 'molecular scissors' used are

(A) Plasmid
(B) Restriction enzymes
(C) Vectors
(D) Sigma factor

5. 'Cry genes' that code for insecticidal toxins are present in

(A) Cotton bollworms
(B) Nematodes
(C) Corn borer
(D) *Bacillus thuringiensis*

Section B

6. State the cause of inbreeding depression in cattle. Mention a way to overcome it.

7. Mendel did not explain the expression of incomplete dominance in plants. Give an example of flower exhibiting incomplete dominance.

Name and state the Law of Mendel the genes which exhibit incomplete dominance follow.

OR

7. Your teacher gave you a tall pea plant and asked you to find whether the plant is homozygous tall or heterozygous tall. How will you proceed to find the genotype of the given plant?

8. Draw a schematic diagram of a transcription unit with the polarity of the DNA strands and label coding strand, template strand and terminator.

9. Causative organisms of some diseases gain entry into human body through mosquito bites and make humans suffer from the disease.

Name one such :
(i) protozoan disease along with the scientific name of the causative organism.
(ii) helminthes disease along with the scientific name of the causative organism.

10. What is 'bagging'? State its importance in artificial hybridization of flowering plants.

11. (a) Mention the difference in the level of BOD before and after the secondary treatment of sewage water.
(b) Write the importance of 'flocs' during the secondary treatment of sewage.

12. Explain the action of EcoRI on DNA in rDNA technology experiment.

Section C

13. How does the human body respond to an allergen? Write the type of antibody produced by it. Name the type of drugs that can help in reducing the symptoms of allergic reactions.

14. Name the three different parts of a human sperm and write their involvement in the process of fertilisation.

15. Why do doctors suggest some married couples to go for 'IVF'? Explain the steps carried out in the process of 'IVF'.

16. Explain the events occurring in a 'Replicating Fork' during replication of DNA.

OR

16. Name the different types of RNA polymerases in a eukaryotic cell. Write their roles in transcription.

17. Why are poultry farms set up? Write the different components to be kept in mind in poultry farm management.

18. Describe the technique that is very effectively used to get a large amount of desired DNA for research and detailed investigation.

19. What are transgenic animals? How are they being used for vaccine safety and chemical safety testing? Explain.

20. Differentiate between pleiotropy and polygenic inheritance by taking one example of each.

OR

20. State Oparin and Haldane hypothesis. How did S.L. Miller experimentally prove it? Explain.

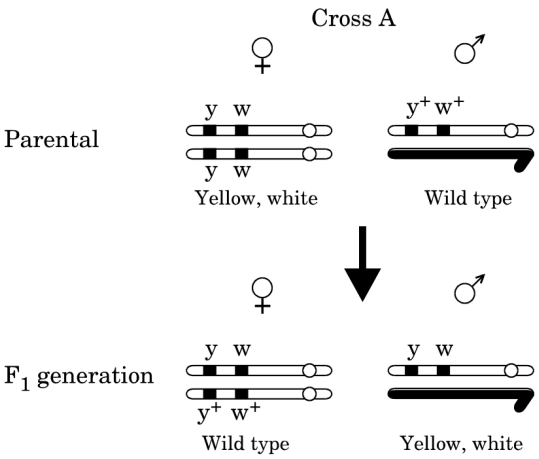
21. Name the two primary lymphoid organs in humans. Explain their functions in providing immunity.

Section D

22. Tigers inhabit forests. Over the past many decades the tiger population was on the decline in our country. A project 'Save Tiger' was launched in 1973 to conserve this precious species. It is heartening to see in the last couple of decades that there has been a gradual increase in the tiger population in our country.

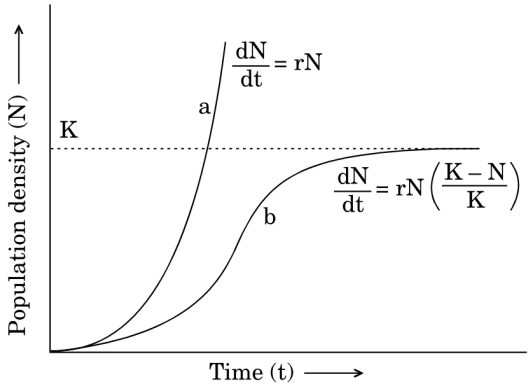
Answer the questions :
(a) Mention one major cause responsible for the decline in tiger population.
(b) Write one main effort of the biodiversity conservationists that must have helped in the increase in tiger population.
(c) State how it is possible to count the number of tigers in a forest area.

23. T.H. Morgan carried out a cross on *Drosophila Melanogaster*, involving genes for body colour (y^+/y) and genes for eye colour (w^+/w). Study the schematic representation of the cross upto F_1 generation and answer the questions that follow :



(a) Name the kind of cross it represents.
(b) Identify and write the dominant phenotype with respect to eye colour.
(c) What are these genes located on the chromosome shown referred to as?

24(a). Study the graph given below showing the different types of growth curves of different species.



Answer the questions :

Name the type of growth curve 'a' shown in the graph.

24(b). State one reason why the growth curve 'b' is said to be logistic.

24(c). What is 'K' representing in the equation $dN/dt = rN[(K-N)/K]$ given along the logistic curve.

Section E

25. Compare the mechanism of sex determination in humans, honeybees and birds.

OR

25. (a) Write the symptoms of Thalassemia in humans. How is the disease caused? Explain.
(b) Thalassemia and sickle cell anemia are both blood related diseases in humans but very different. How?

26. (a) What is ecological succession?
(b) How is ecological succession which starts on bare rocks/area different from ecological succession which begins in an abandoned farmland?

OR

26. (a) With the help of suitable examples, describe the following interactions in a living community :
(i) Parasitism
(ii) Commensalism
(iii) Predation
(iv) Competition
(b) Mention one common characteristic that exists amongst organisms showing commensalism, predation and parasitism types of interactions.

27. Where does megasporogenesis begin in an ovule of an angiosperm? Describe the process up to the development of a mature embryo sac.

OR

27. (a) Differentiate between spermatogenesis and oogenesis in humans starting from primary spermatocyte and primary oocyte up to the respective gamete formation.
(b) Draw a labelled diagram of a human ovum.

- End of Question Paper -