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INDIAN SCHOOL SOHAR

Class: XII **PREBOARD EXAMINATION (2019 -20)** **Max. Marks: 70**

Date: 3.2.2020 **BIOLOGY (044)** **Duration: 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.*
   *Section **B** contains question numbers 6 to 12, short answer type I questions of two marks each.*
   *Section **C** contains question numbers 13 to 21, short answer type II questions of three marks each.*
   *Section **D** contains question number 22 to 24, case-based short answer type questions of three marks each.*
   *Section **E** contains question numbers 25 to 27, long answer type questions of five marks each.*
3. *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 in the question paper with the same question number.*
4. *Wherever necessary, the diagrams drawn should be neat and properly labeled.*

SECTION-A

1. Asexually reproductive structures seen in sponges:
   a) zoospores b) conidia c) gemmules d) buds.

OR

In non-primates mammals the cyclic changes during reproduction are called
a) oestrus cycle b) menstrual cycle c) juvenile cycle d) vegetative phase. 1

2. DNA cannot pass through cell membrane. The bacterial cell is made competent to take up DNA by
   a) heat shock b) micro-injection c) biolistics d) disarmed pathogen. 1
3. The barrier that protects the non-infected cells from further viral infection.
   a) cytokinin barrier b) physiological barrier c) cellular barrier d) physical barrier. 1
4. The technique that is based on the principle of antigen antibody interaction
   a) Elecrophoresis b) ELISA c) PCR d) Cloning. 1
5. Organisms like zooplantons tide over unfavourable conditions by
   a) hibernation b) aestivation c) diapause d) migration.

OR

Which of the following is a pioneer species in xerarch succession?
a) phytoplankton b) lichens c) sedges d) bryophytes. 1

SECTION-B

6. A mother of a one year old child wanted to space her second child. She adopted for oral contraception. How do oral contraceptive pills act in a human female? 2
7. A multinational company outside India tried to propagate a new variety of crop without proper authorization.
   a) Name the term used and cite an example for such an act committed by the multinational company.
   b) Analyse the unethical practice adopted by MNC and suggest provisions in the Indian Law to prevent such malpractices. 2

8. Choose and rearrange any four of the following groups of plants in as ascending evolutionary scale: Cycads, Gnetales, Monocotyledons, Rhynia-like plants, Chlorophyte ancestors, Dicotyledons and seed ferns.

OR

The phenotypic and genotypic ratio in the F_2 generation are the same in certain kind of inheritance. Taking an example work out a cross to depict this and mention the pattern of inheritance involved. 2

9. a) 'A population has been exhibiting genetic equilibrium'. Explain the statement.
b) Draw a graph to show how natural selection leads to directional selection. 2

10. In autogamy, pollination is achieved within the same flower. What are the two pre-requisites for this to happen? 2

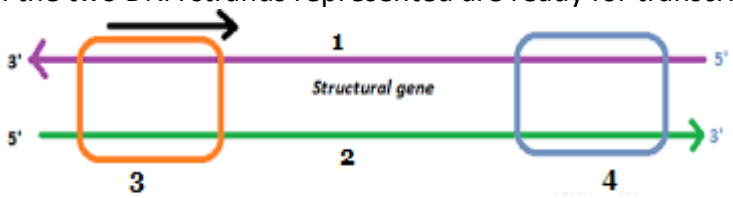
11. Population in terms of number is not always a necessary parameter to measure population density. Justify giving two examples. 2

12. A recombinant DNA is inserted within the coding sequence of beta galactosidase enzyme and is introduced into a bacterium. Explain the method that would help in the selection of recombinants from non-recombinant ones. 2

SECTION-C

13. The embryo formation starts after a certain amount of endosperm is formed. With the help of a labelled sketch depict the fertilized embryo sac. 3

14. In the following diagram the two DNA strands represented are ready for transcription.

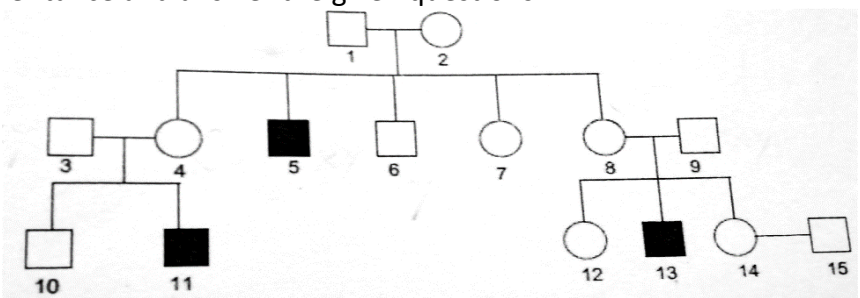


a) Label the parts marked 1to 4 and state their role in transcription.
b) Which one of the two strands of DNA has nucleotide sequence similar to the mRNA that will be transcribed and why? 3

15. a) In which part of the human female reproductive system do the following events take place?
i) release of the first polar body, ii) fertilisation
iii) release of the second polar body, iv) implantation.
b) 'Parturition is induced by a complex Neuro endocrine mechanism'. Justify. 3

16. a) Explain the transcriptionally regulated system elucidated by Jacob and Monod.
b) Why does glucose or galactose not act as an inducer for the operon? 3

17. The pedigree chart given below shows the inheritance of haemophilia in a family. Study the pattern of inheritance and answer the given questions.



a) Give the possible genotypes of the individuals '1' '2' '5'and '12'.
b) A blood test shows that individual 14 is a carrier of haemophilia. The member 15 has recently married the member numbered 14. What is the probability that their first child will be a haemophilic? Depict this with a Punnett square. 3

18. Fill in the gaps from A to F in the given table. 3

Microbe	Products	Significance
Streptococcus	A)----------	B) ----------
C) ----------	D)----------	Blood cholesterol lowering agents
E) ----------	Swiss cheese	F) ----------

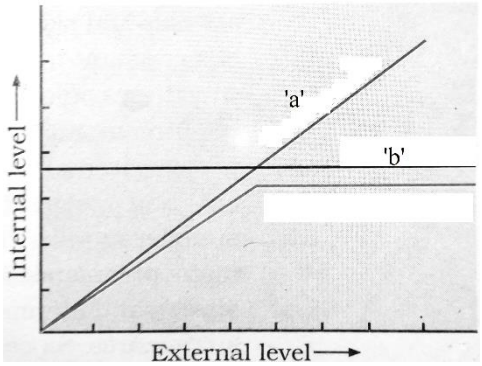
19. Suggest and describe a technique used to obtain multiple copies of a gene of interest in vitro.

OR

Gene therapy allows the correction of a defective gene that has been in a child or embryo. Illustrate this taking an example. 3

20. Biotechnology has helped famers to get pest resistant cotton crops.
    a) Name the source and the type of genes isolated from the bacterium for incorporation into crops.
    b) Why do leptidopterans die, when they feed on the cotton crop? 3

21. The following graph represents the organismic response to certain environmental condition like temperature.



    a) Identify 'a' and 'b' in the given graph.
    b) How do these organisms differ from each other with reference to homeostasis?
    c) Mention the category to which humans belong. 3

OR

Wetlands are among the most diverse and productive ecosystems. However they continue to be degraded and converted to other uses.

    a) What is the main objective of the Ramsar Convention?
    b) What are the areas that are included under wetlands?
    c) Wetlands are vital for human survival. Justify. (Any two points)

SECTION-D

22. A woman aged 35 years had a history of inherited disorders in her family. Other screening tests, such as the combined first trimester screening test, have shown that the baby may have health problems. An amniocentesis can provide a clear diagnosis.
    a) What is amniocentesis?
    b) Why is there a statutory ban on the above technique?
    c) Name two chromosomal abnormalities learnt that can be diagnosed using this technique. 3

23. Malaria is a life-threatening disease caused by parasites that are transmitted to people through the bites of infected female Anopheles mosquitoes. It is preventable and curable. In 2017, there were an estimated 219 million cases of malaria in 87 countries.

a) Name the stage of *Plasmodium* that gains entry into the human body and trace the stages It undergoes in the human body after its entry.

b) How can these vectors and their breeding places be controlled? (Any two points) 3

24. Over the past 30 years humans have made progress in stopping damage to the ozone layer by curbing the use of certain chemicals. But more remains to be done to protect and restore the atmospheric shield that sits in the stratosphere above the Earth's surface.

a) Why is the damage of the ozone layer a cause of concern?

b) State the causes of depletion of ozone layer.

c) Specify any two ill-effects that it can cause in human beings. 3

SECTION-E

25. a) An organic farmer relies on natural predation for controlling plant pests and diseases. Why is this considered to be a holistic approach? (Three points)

b) Having realized the problems of overuse of chemical fertilisers, there is large pressure to switch to biofertilisers. Explain taking two examples how they reduce the dependence on chemical fertilisers.

OR

As traditional breeding techniques failed to keep pace with the agricultural demands and to provide sufficiently fast and efficient systems for crop improvement, a technology was developed in 1950s.

a) Name the technology developed and briefly write the procedure followed.

b) Mention any three advantages of the technique to mankind. 5

26. a) In a dihybrid cross, white eyed, yellow bodied female Drosophila was crossed with red eyed, brown bodied male drosophila. The cross produced 1.3percent recombinants and 98.7 percent progeny with parental type combinations in the F2 generation. Analyze the above observation and compare with the Mendelian dihybrid cross.

b) Why did Morgan use fruit flies as his experimental material?

OR

Certain phenotypes in human population are spread over a gradient and reflect the contribution of more than two genes. Mention the term used for the type of inheritance? Describe it with the help of an example in human population. 5

27. a) Outline the salient features of Carbon cycling in an ecosystem.

b) Enumerate two human activities that have significantly influenced the carbon cycle.

OR

a) Give three hypothesis for explaining, why tropics show greater levels of species richness.

b) A particular species of wild cat is endangered. In order to save them from extinction, which is a desirable approach *in situ* or *ex situ*? Justify your answer and give two difference between the two approaches. 5

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