No of Printed Pages: 4

INDIAN SCHOOL SOHAR

Class: XII **TERM II EXAMINATION (2018 -19)** **Max. Marks: 70**

Date: 26.11.18 **BIOLOGY** **Duration: 3Hrs**

General Instructions:-

- *All questions are compulsory. There are 27 questions in all.*
- *This question paper consists of four sections **A, B, C & D.***
- *Section **A** contains **5** questions of **1**mark each, Section **B** contains **7** questions of **2** marks each. Section **C** contains **12** questions of 3 marks each and Section **D** **contains 3** questions of **5** marks each.*
- *Internal choices have been provided in two questions of one mark, two questions of two marks, four questions of three marks and three questions of five marks weightage. **A student has to***
- *Questions of Section **A** are to be answered in one word or **one sentence** each, Section **B** in approximately **20-30** words each, Section **C** in **30-50** words each and Section **D** in **80-120** words each.*
- *Wherever necessary, the diagrams drawn should be neat and properly labeled.*

SECTION-A

1. Hybrid seeds have to be produced year after year. Justify.

OR

Mention the role of the trophoblast in the human embryo. 1

2. Why should a bisexual flower be emasculated and then bagged prior to artificial pollination in hybridization programme? 1

3. Retroviruses have no DNA. However, the DNA of the infected host cell does possess viral DNA. How is it possible? 1

4. Why Agrobacterium is called the natural genetic engineer of plants? 1

5. Why are cattle and goats not seen browsing on *Calatropis* grown in abandoned fields?

OR

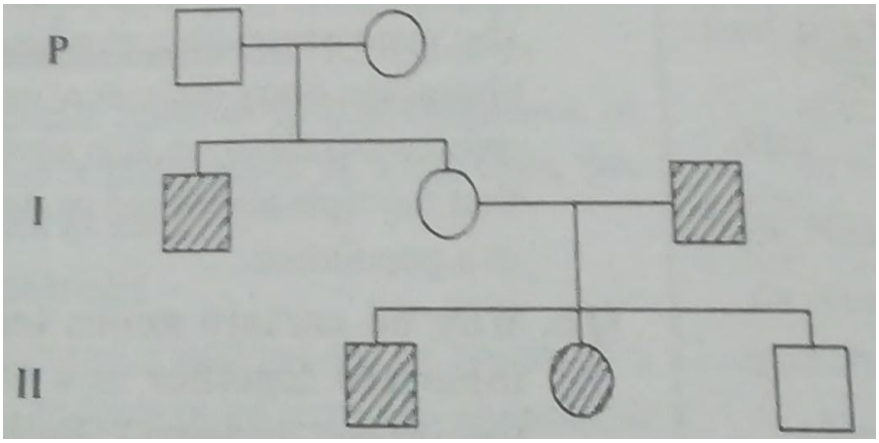
How do bears and zooplanktons avoid stressful external conditions? 1

SECTION-B

6. Provide genetic explanation for the observation in which the flower colour in F_1 generation of snapdragon did not resemble either of the two parents. However parental characters reappeared when F_1 progenies were selfed. Justify.

OR

Observe the pedigree chart and answer the following questions:



a) Identify whether the trait is sex linked or autosomal.
b) Give the genotype of the parents and the daughter and son of the second generation.
c) Give an example of a disease in human beings which show the above pattern of inheritance. 2

7. Haploid content of human DNA is 3.3×10^{-9} bp and the distance between two consecutive bp is 0.34×10^{-9}. What is the length of the DNA molecule? 2

8. Describe the two different methods of embryo transfer in the test tube baby programme. 2

9. In an agricultural field, there is a prevalence of the following crop diseases and pests which are affecting the crop yield badly:
a) White rust b) Aphids c) Leaf and stripe rust d) Jassids
Recommend the varieties of crops the farmers should grow to get rid of the existing problem and thus, improve the crop yield. 2

10. Draw a neat labelled diagram showing the structure of an antibody molecule. 2

11. Name the type of interaction seen in each of the following examples:
a) Wasp pollinating fig infloresence.
b) Clown fish living among the tentacles of sea-anemone.
c) Koel and the crow.
d) Disappearance of smaller barnacles when Balanus dominated the Coast of Scotland.

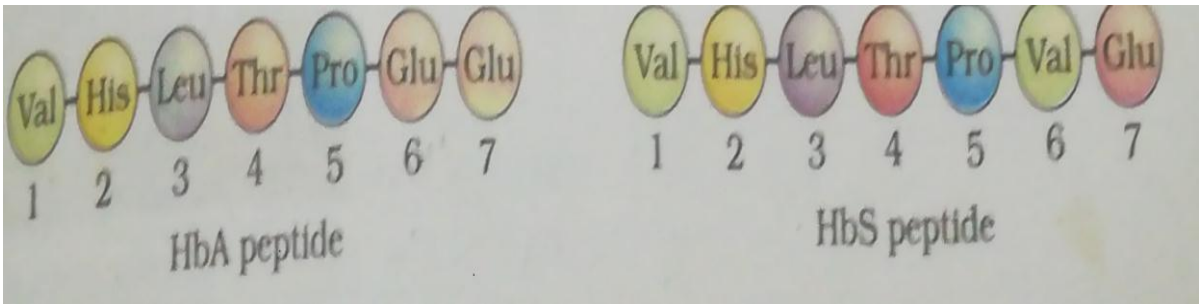
OR

Explain with the help of an example how the pyramid of number and pyramid of biomass can look inverted. 2

12. When and where do chorionic villi appear in humans? State their function. 2

SECTION-C

13. A relevant portion of the chain of haemoglobin of a normal human and the sufferer is given below.



a) The codon for the sixth amino acid glutamic acid is mutated to valine. Explain giving reasons how could mutation bring about the change in the codon?
b) Name the disease caused and explain its pattern of inheritance. 3

14. Reproductive and child health care programme is under action. It holds a seminar in your locality for creating awareness. Explain, the role played by governmental and non-governmental agencies to improve on reproduction related areas.

OR

Pollination by water is quite rare in flowering plants and is limited. Explain, how pollination takes place in water lily, *Vallisneria* and sea grasses. 3

15. a) Draw a schematic representation of the structure of a transcription unit.
b) Mention the function of promoter gene and the terminator in transcription. 3

16. What are 'flocs'? State their role in effluent treatment and their ultimate fate in STPs.

OR

A herd of cattle showed reduced fertility and productivity. Provide one reason for the same. Mention the advantages and explain one suggestion to overcome this problem. 3

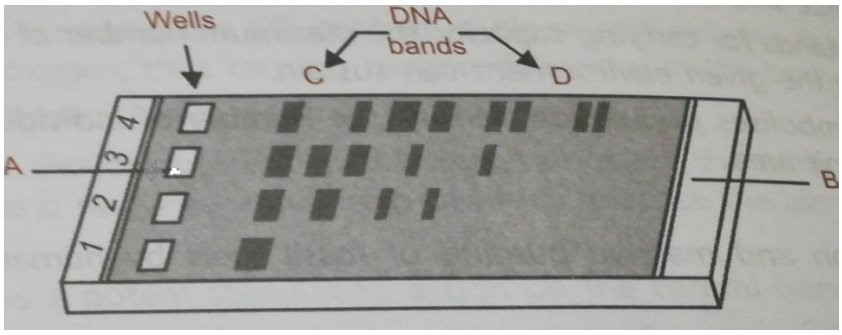
17. a) p2 + 2pq + q2 = 1. Explain this algebraic equation on the basis of Hardy-Weinberg's principle.

b) How does the genetic equilibrium get disturbed and may lead to founder effect?

OR

Evolution is not a directed process, it is a stochastic process based on chance events in nature. Explain citing an example. 3

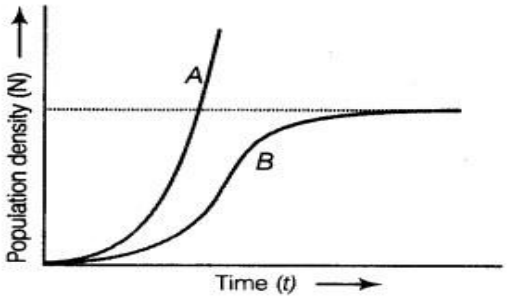
18. Study the diagram given below and answer the questions that follow:



a) Why have DNA fragments in lane 4 moved farther away from 'C' to 'D' in comparison to those in lane 1?
b) Identify the part labelled A and B in the diagram.
c) How are these DNA fragments visualized? 3

19. Name the process involved in the production of nematode resistant tobacco plants, using genetic engineering. Explain the strategy adopted to develop such plants. 3

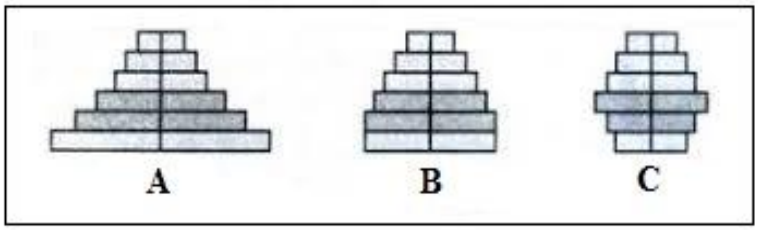
20. Study the graph given below and answer the questions that follow



a) Write the status of food and space in the curves 'A'and 'B'.
b) In the absence of predators, which one of the two curves would appropriately represent prey population?
c) Time has been shown on X-axis and there is a parallel dotted line above it. Give the significance of this dotted line.
d) Which curve 'A' or 'B' is considered to be a more realistic one and why?

OR

Study the different age pyramids for human population given below and answer the questions that follows:



a) Identify the names given to each of these age pyramids.
b) What does the size of the population indicate?
c) Mention the attributes that a population possess. 3

21. Diagrammatically represent the steps involved in the formation of recombinant DNA by action of restriction endonuclease enzyme. 3

22. Amazonian rainforest has the greatest biodiversity on earth. List three hypothesis that are proposed by biologists to account for the biological biodiversity in the tropic. 3

23. a) Cancer is one of the most dreaded diseases of humans. Explain 'Contact inhibition' and 'Metastasis' with respect to the disease.
b) Bone-marrow and the thymus the main lymphoid organ. Justify.
c) How does the moderate and high dosage of cocaine affect the human body? 3

24. Represent schematically the phosphorus cycle operating in a terrestrial ecosystem. 3

SECTION-D

25. With a diagrammatic representation depict the development of the mature embryo sac of an angiosperm. Mention their fate of the cells on fertilisation.

OR

Draw a sectional view of the human ovary showing different stages of oogenesis along with a corpus luteum. Mention the role of corpus luteum and the zona pellucida of the ovum. 5

26. Jacob and Monod elucidated a transcriptionally regulated system. Describe the role of lactose in the lac operon.

OR

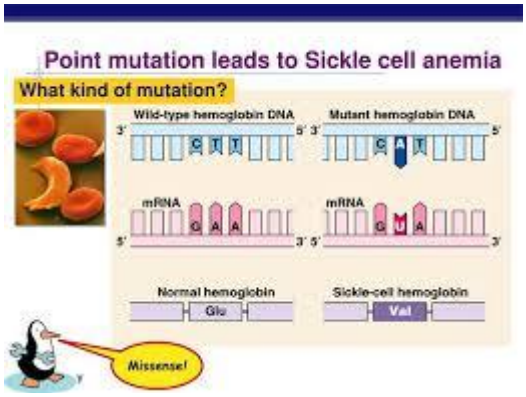
How did Messelson and Stahl prove that DNA in chromosomes replicate semi- conservatively? 5

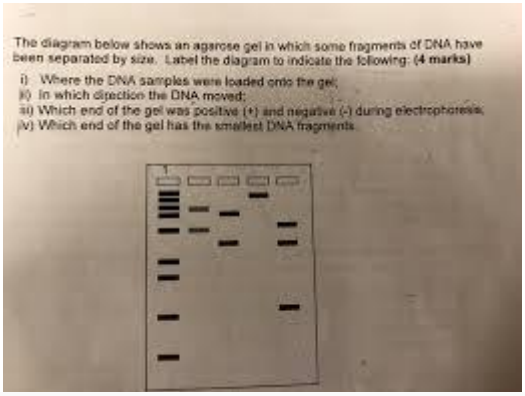
27. a) How does succession help in the conversion of a hydrophytic habitat into mesophytic one?
b) What are the factors that affect secondary succession?

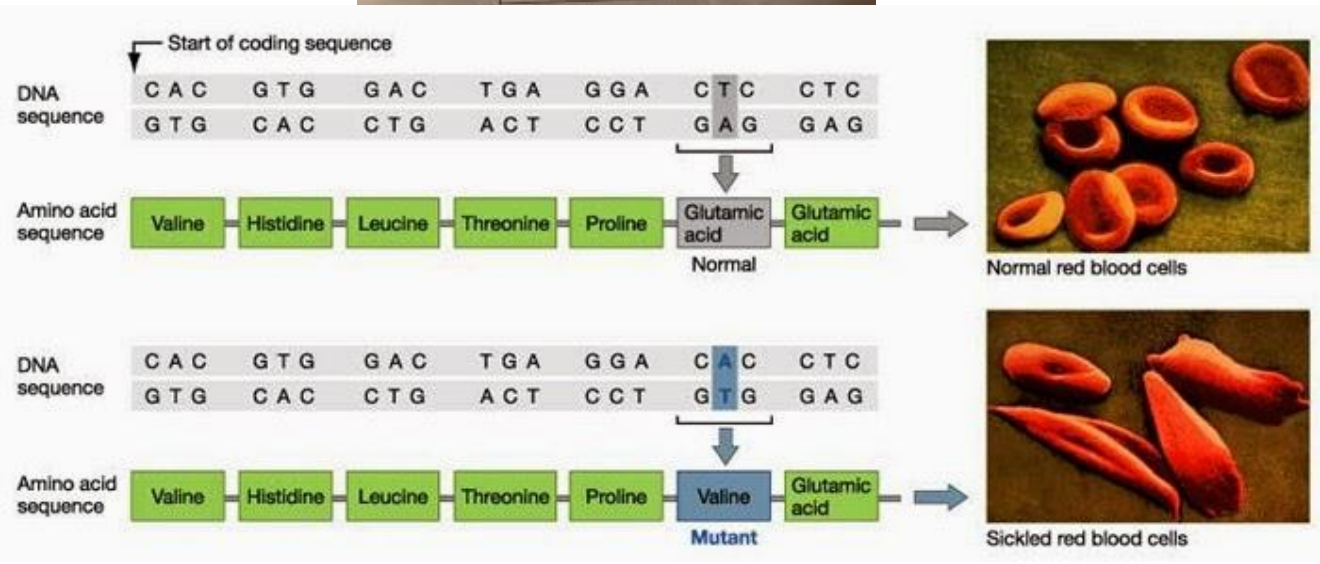
OR

a) How is the sixth episode of extinction presently in progress different from the previous episodes?
b) Explain the various causes that have brought about this difference. 5

****


Point mutation leads to Sickle cell anemia
What kind of mutation?
Wild-type hemoglobin DNA
Mutant hemoglobin DNA
mRNA
mRNA
Normal hemoglobin
Glu
Sickle-cell hemoglobin
Val
Missense!


The diagram below shows an agarose gel in which some fragments of DNA have been separated by size. Label the diagram to indicate the following: (4 marks)
i) Where the DNA samples were loaded onto the gel;
ii) In which direction the DNA moved;
iii) Which end of the gel was positive (+) and negative (-) during electrophoresis;
iv) Which end of the gel has the smallest DNA fragments.


Start of coding sequence
DNA sequence
CAC GTG GAC TGA GGA CTC CTC
GTG CAC CTG ACT CCT GAG GAG
Amino acid sequence
Valine
Histidine
Leucine
Threonine
Proline
Glutamic acid
Glutamic acid
Normal
Normal red blood cells
DNA sequence
CAC GTG GAC TGA GGA CAC CTC
GTG CAC CTG ACT CCT GTG GAG
Amino acid sequence
Valine
Histidine
Leucine
Threonine
Proline
Valine
Glutamic acid
Mutant
Sickled red blood cells