



INDIAN SCHOOL SOHAR
PRE-BOARD EXAM-2017
BIOLOGY

STD XII
18.1.17

Marks:70
Time:3Hrs

General Instructions:-

- (i) This question paper consists of five sections **A, B, C, D and E**. Section **A** contains **5** questions of **1** mark each, section **B** is of **5** questions of **2** marks each, section **C** is of **12** questions of **3** marks each, Section **D** contains **1** question of **4** marks and section **E** is of **3** questions of **5** marks each.
- (ii) All questions are compulsory.
- (iii) There is no overall choice. However, an internal choice is provided in one question of **2** marks, one question of **3** marks and all questions of **5** marks weightage. Attempt only **one** of the choices in such questions.
- (iv) 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 30-40 words and section **E** in 80-120 words each.
- (v) Wherever necessary, the diagrams drawn should be neat and properly labeled.

SECTION-A

1. Why is the period between 10th and 17th days of menstrual cycle called the fertile period? (1)
2. How do histones acquire a positive charge? (1)
3. How is a cancer cell different from a normal cell? (1)
4. How has man exploited Cry protein to his benefit? (1)
5. How is diapause different from hibernation? (1)

SECTION-B

6. Wind pollination is quite common among abiotic pollinations. List four characteristic features of wind pollinated flowers. (2)
7. Name the disorder, give the karyotype and characteristic symptoms a human suffers due to the presence of an additional X- chromosome in the body. (2)

OR

Mention the characteristics of Neanderthal Man that lived in near East & Central Asia.

8. In our body, cell growth and differentiation is highly controlled and regulated. Explain two situations where there is breakdown of these regulatory mechanisms. (2)
9. Explain, how introduction of Alien species into an ecosystem will lead to loss of biodiversity in that area taking an example from India and abroad. (2)
10. (a) A population has certain attributes that an individual organism does not. Name them. (2)
(b) If in a pond there are 20 lotus plants last year and through reproduction 8 new plants are added taking the current population to 28. Calculate the birth rate.

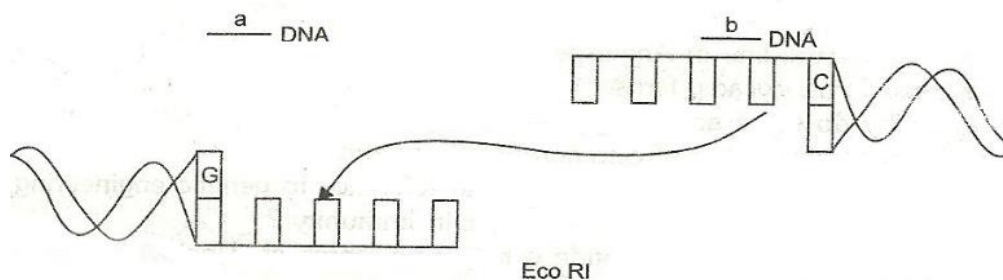
SECTION-C

11. Explain the development and the structure of the male gametophyte in plants. (3)
12. Draw a neat diagram showing the structure of a human ovum surrounded by corona radiata. (3)
Label the following parts: ovum, plasma membrane, zona pellucida. State the function of zona pellucida.
13. Australian marsupials and placental mammals are the suitable examples of adaptive radiation (3) and convergent evolution explain giving reasons.

OR

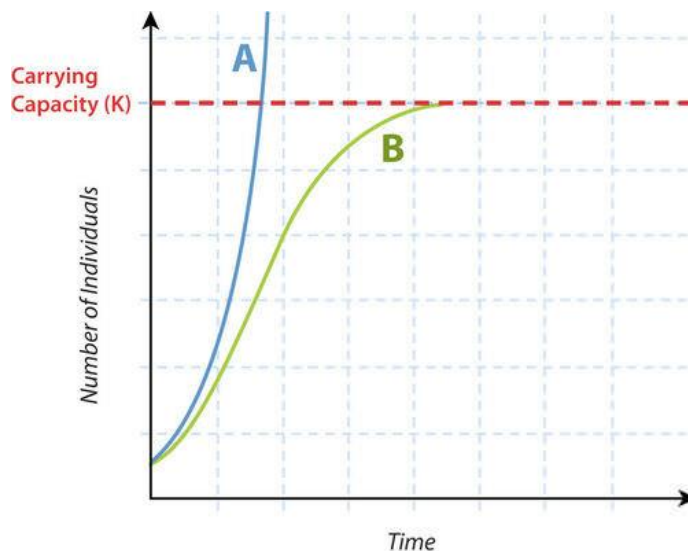
Explain, how Industrial Melanism supports Darwinian natural selection.

14. (a) Name the three major types of RNAs needed for protein synthesis and mention their function. (3)
(b) Structural genes may be monocistronic or polycistronic. Bring out the differences between the two.
15. Using a Punnett square, workout the distribution of phenotypic features in the first filial generation after a cross between a homozygous female and a heterozygous male for a single locus. Mention the phenotypic and genotypic ratio. (3)
16. (a) How is innate immunity different from the immunity that you acquire through vaccination?
(b) Mention the role played by the primary lymphoid organs in the human body. (3)
17. Breeding and development of cultivars resistant to diseases enhances food production. List the steps involved in breeding plants for disease resistance. Cite two examples. (3)
18. Cite an example each to understand the role played by microbes as (i) biocontrol agents (ii) biofertilisers and (iii) an energy source . (3)
19. The following figure depicts the linking of DNA fragments to form a recombinant DNA: (3)



- (a) Name 'a' and 'b' in the above figure.
 - (b) Complete the palindrome which is recognized by EcoRI.
 - (c) Name the enzyme that can recognizes such a sequence and can link the two DNA fragments.
20. How did the process of RNAi help to control the nematode from infecting the roots of tobacco plants? Explain. (3)
 21. (a) Diagrammatically represent the sedimentary cycle in an ecosystem. (3)
(b) Decomposition is the breakdown of complex organic matter into inorganic substances.
List the factors that affect the process of decomposition.

22. The below graph shows the population growth curve. (3)
- (a) Identify the growth curves 'A' and 'B' and write the status of food and space in the curves 'A' and 'B' .
- (b) What does the dotted line parallel to the 'X' axis signify?
- (c) Which one of the curve is considered realistic and why?



SECTION-D

23. The "record-high" air pollution in New Delhi is a "wake-up call" for the world that unless decisive actions are taken to reduce air pollution, the smog in India's capital and its adverse impact on the daily lives of its citizens will become a commonplace phenomenon, the United Nations children's agency has said. "At a global scale, we need better monitoring of air pollution. When a child, a mother, a father or caregiver know how bad the air is on a real-time basis, they can begin to take actions to reduce exposure." (4)
- (a) What are the deleterious effects of pollutants on humans and animals?
- (b) Name the most widely used device and the principle used in it for removing particulate pollutants in air.
- (c) As responsible citizens, enumerate the steps that can be taken to reduce vehicular air pollution in metro cities. (4 points)

SECTION-E

24. (a) Describe the post-zygotic events leading to implantation and placenta formation in Human. (5)
- (b) What is meant by foetal ejection reflex? Which hormones are involved in induction of parturition?

OR

- (a) Trace the post- pollination events that take place in a flower that leads to fertilization.
- (b) Explain the process of development the endosperm' undergoes in albuminous and exalbuminous seeds. Give one example for each of these seeds.

25. (a) Regulation of gene expression occur at various levels and results in the formation of a polypeptide. How is gene expression regulated at various levels in eukaryotes? (5)
- (b) Represent schematically how the lac operon in E.coli gets 'switched on'?

OR

- (a) Human genome project was called a mega project. List some of the important goals of HGP.
- (b) List the applications and future challenges of HGP.

26. (a) Recombinant DNA technology involves several steps in a specific sequence. How is isolation of the genetic material done? (5)
- (b) State the role of DNA polymerase isolated from *Thermus aquaticus*.

OR

- (a) A recombinant vector with a gene of interest inserted within the gene of alpha –galactosidase enzyme is introduced into a bacterium. Explain the method that would help in the selection of recombinants from non-recombinant ones. Why is this method of selection referred to as 'insertional inactivation'?
- (b) Citing an example, explain how genes can be delivered to transform eukaryotic cell and force them to do what the bacteria or viruses want to?

*****THE END*****