Roll Number		

SET A

INDIAN SCHOOL MUSCAT
FINAL EXAMINATION
BIOLOGY

CLASS: XII | Sub. Code: 044 | Time Allotted: 3 Hrs.

21.11.2019 | Max. Marks: 70

General Instructions:

a) There are a total of 27 questions and five sections in the question paper. All questions are compulsory.

b) 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.

c) 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.

d) Make your Handwriting legible

SECTION – A

1. The phenotypic ratio of Incomplete dominance is 1

a) 3:1
b) 1:1
c) 9:3:3:1
d) 1:2:1

OR

Phenyl Ketonuria is caused

a) by mutation of gene coding for Phenyl alanine carboxylase
b) by mutation of gene coding for Phenyl Hydroxy oxygenase
c) by mutation of gene coding for Phenyl alanine hydroxylase
d) by mutation of gene coding for Phenyl oxygenase

2. In Urey and Miller experiment the closed flask contained the gases except 1

a) CH_4

b) H_2

c) O_2

d) NH_4

3. GEAC stands for 1

a) Genome Engineering Action Committee

b) Ground Environment Action Committee

c) Genetic Engineering Approval Committee

d) Genetic and Environment Approval Committee

OR

α-antitrypsin is

a) An antacid

b) An enzyme

c) used to treat arthritis

d) used to treat emphysema

4. 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? 1

a) Sal I

b) Pvu I

c) EcoRI

d) Hind III

5. Ecological niche is 1

a) The surface area of ocean

b) An ecologically adapted zone

c) The physical position and functional role of a species within the community

d) Formed of all plants and animals living at the bottom of a lake

SECTION B

6. Can a child have blood group 'O' if his parents have blood group 'A' and 'B'. Explain. 2

7. Following are the features of genetic codes. What does each one indicate? 2

Stop codon, Unambiguous codon, Degenerate codon; universal codon

OR

Write the transcription product sequence for

a) 5'ATGCACTGATCCAA3'

b) 3'GTACGTACGTAC5'

8. Explain the experiment which disproved the theory of spontaneous generation. 2

9. How Pneumonia differs from common cold in respect of its infection sites and pathogens. 2

10. 2

5′ —— GAATTC —— 3′
3′ —— CTTAAG —— 5′

Name the specific enzyme which will act this palindrome site shown here and how do they cut this strand and how this action is useful for the action of DNA Ligase.

11. How genetically modified tobacco plant fights against nematode *Meloidegyne incognitia*? 2

12. Write any *four* uses of PCR technique. 2

SECTION C

13. Mention the two problems of using nuclear energy. Nuclear waste is the dangerous pollutant. Justify it. 3

OR

i) What is snow blindness? How is it caused?

ii) Why CO_2 and CH_4 are commonly called greenhouse gases?

14. a) Explain the role of earthworm, bacteria and fungi in decomposition. 3

b) Name the major producers of terrestrial and aquatic ecosystem.

15. Why is predation important in biodiversity-rich ecosystem? Explain with two suitable examples. 3

16. (a) Explain with an example, how insertional inactivation of an enzyme is used as a selectable marker. 3

(b) What is the use of chitinase and lysozyme in biotechnology?

17. How is ADA-deficiency caused and which system is affected by it? What is the source of ADA gene? Explain how ADA gene cDNA is introduced into the cells. 3

18. IARI has released several varieties of crop plants that are biofortified. Give three examples of such crops and their biofortification. 3

OR

What is poultry? State the components of poultry farm management.

19. (a) Why are cancer patients administered interferons as part of the treatment? 3

(b) Name the site and the host where each of the following are formed for a malarial parasite;

(i) Sporozoites

(ii) Gametocytes

20. (a) What are homologous and analogous organs? 3

(b) Select and write analogous structures from the list given below;

(i) Wings of butterfly and birds

(ii) Vertebrate hearts

(iii) Thorn and Tendrils of bougainvillea and cucurbita

(iv) Tubers of sweet potato and potato

21. (a) Expand VNTR and describe its role in DNA fingerprinting 3

(b) List any two applications of DNA fingerprinting technique.

SECTION D

22. "A population has been exhibithing genetic equilibrium". 3

Answer the following with regard to the above statement.

(i) Explain the above statement.

(ii) Name the underlying principle.

(iii) List any two factors which would upset the genetic equilibruim of the populationn.

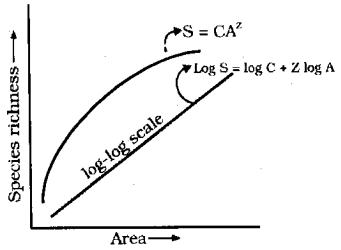
(iv) Take up any one such factor and explain how the gene pool will change due to that factor

23. In industry, microbes are used to synthesize a number of products valuable to human beings. Beverages and antibiotics are some examples. Microbes are also used for commercial and industrial production of certain chemicals like organic acids, alcohols and enzymes. They play a vital role in a day to day life. 3

(a) What is "*toddy*"?

(b) How is '*Statin*' produced? Explain its mechanism of action.

24. 3



The graph explains the area and species richness relationship. With reference to this graph answer the following questions:

(a) What do you infer from the graph shown here?

(b) Name the scientist on whose observation in South American jungles made this generalization.

(c) What is the z-value of the frugivorous birds and mammals in tropical forests?

SECTION E

25. (a) When a cross is made between a tall pea plant with yellow seeds(TtYy) and another tall pea plant with green seeds(Ttyy), What proportion of phenotype I nthe offspring would be expected to be; (i) tall and green (ii) dwarf and green?

(b) Why are grasshopper and *Drosophila* said to show male hetergamety? Explain.

(c) Name one such trait each in humans and *Drosophila*, whose gene is located on X-chromosome in both.

OR

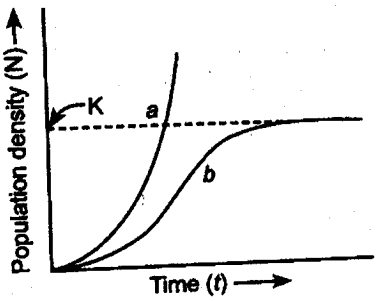
(a) Represent only diagrammatically the replication of DNA.

(b) Why is tRNA called an "adapter"?

(c) Draw and label the secondary structure of tRNA carrying methionine.

26. (a) Represent diagrammatically the age pyramids of (i) an expanding population and (ii) a stable population.

(b) Study the population growth curve in the graph given below and answer the questions which follow:



(i) Identify the growth curves 'a' and 'b'.

(ii) Which one of them is considered a more realistic one and why?

(iii) If dN/dt= rN(K-N/K) is the equation of one of the growth curves, What does K stand for?

(iv) What is symbolized by N?

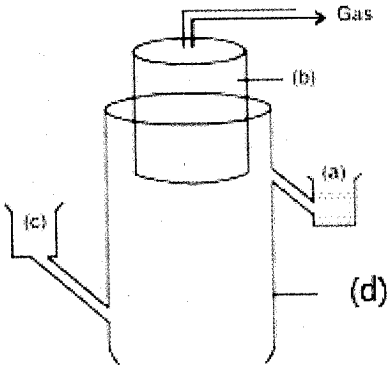
OR

(a) Name any two human activities that influence carbon cycle.

(b) State any two differences between phosphorus and carbon cycles in nature.

(c) Mention the importance of phosphorus to living organisms.

27. The diagram is that of a typical biogas plant. Explain the sequence of events occurring in a biogas plant. Identify a, b,c and d. state the components of biogas.



OR

(a) Describe in detail, the secondary treatment of sewage, till it is fit for discharge into a water body. Why is it called a biological process?

(b) What are biofertilizers? Give two examples.

End of the Question Paper