Roll Number		

SET C

INDIAN SCHOOL MUSCAT
FIRST PRE – BOARD EXAMINATION
BIOLOGY

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

14.03.2021 | Max. Marks: 70

General Instructions:

(i) All questions are compulsory.

(ii) The question paper has four sections: Section A, Section B, Section C and Section D. There are 33 questions in the question paper.

(iii) Section–A has 14 questions of 1 mark each and 02 case-based questions. Section–B has 9 questions of 2 marks each. Section–C has 5 questions of 3 marks each and Section–D has 3 questions of 5 marks each.

(iv) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

(v) Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION A

1	Name the part of gynoecium that determines the compatible nature of pollen grain.	1
2	In case of polyembryony, if an embryo develops from the synergid and another from the nucellus which is haploid and which is diploid?	1
3	Name the type of pollination in Cleistogamous flowers.	1
4	Identify the process of formation of spermatozoa from spermatids.	1
5	Name a plant in which DNA has been completely sequenced.	1
6	In Hershey and Chase experiment, what was the observation in the bacteriophage grown in radioactive phosphorous?	1
7	What would happen if histones were to be mutated and made rich in acidic amino acids such as aspartic acid and glutamic acid in place of basic amino acids such as lysine and arginine?	1
8	Which vector less method is suitable for plants for the transfer of recombinant DNA?	1
9	How is proinsulin different from mature insulin?	1
10	State Allen's Rule.	1
11	Assertion (A) : Nucleotide consists of sugar and phosphate group Reason (B): Phosphate group is attached to sugar through ester bond.	1

(a) Both Assertion and Reason are correct, and reason is the correct explanation of assertion.

(b) Both Assertion and Reason are correct, but reason is not the correct explanation of assertion.

(c) Assertion is true but reason is false.

(d) Assertion is false but reason is true.

12 Assertion (A): Rosie is a transgenic cow that produces milk containing human alpha lactalbumin. 1

Reason (B): Transgenic mice were used to test the safety of Polio vaccine.

(a) Both Assertion and Reason are correct, and reason is the correct explanation of assertion.

(b) Both Assertion and Reason are correct, but reason is not the correct explanation of assertion.

(c) Assertion is true but reason is false.

(d) Assertion is false but reason is true

13 Assertion (A): Logistic growth curve is considered realistic. 1

Reason (B): No species can have unlimited resources to permit exponential growth.

(a) Both Assertion and Reason are correct, and reason is the correct explanation of assertion.

(b) Both Assertion and Reason are correct, but reason is not the correct explanation of assertion.

(c) Assertion is true but reason is false.

(d) Assertion is false but reason is true

14 Assertion (A): The Sixth Extinction presently in progress is similar to the previous episodes. 1

Reason (B): The extinction rate of Sixth episode is slow.

(a) Both Assertion and Reason are correct, and reason is the correct explanation of assertion.

(b) Both Assertion and Reason are correct, but reason is not the correct explanation of assertion.

(c) Both Assertion and Reason are correct.

(d) Both Assertion and Reason are false.

15 **Read the following and answer any four questions from 15(i) to 15(v) given below:** 4

Thalassemia are group of blood disorders caused by defects in the synthesis of globin polypeptide. Since haemoglobin has ă and β polypeptide chains, the mutant gene in sufferer is unable to synthesise one of the globin chains resulting in an excess of the other. In this condition free globin chains which are insoluble, accumulate inside the RBCs. Based on this globin chain is defective. Thalassemia is classified into ă and β thalassemia.

(i) Which among the following is true with respect to thalassemia?

a) Thalassemia is a sex-linked recessive disorder.

b) Thalassemia is an autosomal recessive disorder.

c) Thalassemia is an autosomal dominant disorder.

d) Thalassemia is a chromosomal disorder

(ii) Alpha thalassemia is controlled by

a) HbAHbS

b) HBA1HBA2

c) HbSHbS

d) HBB

(iii)Thalassemia is transmitted from

a) Father to son alone

b) Grandfather to Grandson through daughter

c) From heterozygous parents to the offspring

d) Normal parents to their offsprings only.

(iv)Choose the correct statement.

a) Thalassemia is sex linked whereas sickle cell anaemia is autosomal recessive.

b) Thalassemia is quantitative problem and sickle cell is qualitative problem.

c) Thalassemia is caused by deletion and sickle cell anaemia by insertion.

d) None of the above

(v) Assertion: β thalassemia is caused by a single gene on chromosome 11 of each parent.

Reason: this occurs due to mutation of the genes.

(a) Both Assertion and Reason are correct, and reason is the correct explanation of assertion.

(b) Both Assertion and Reason are correct, but reason is not the correct explanation of assertion.

(c) Assertion is true but reason is false.

(d) Assertion is false but reason is true

16 **Read the following and answer any four questions from 16(i) to 16(v) given below:** 4

Biodiversity describes the richness and variety of life on earth. It is the most complex and important feature of our planet. Without diversity, life would not sustain.
The term biodiversity was coined in 1985. It is important in natural as well as artificial ecosystem. It deals with nature's variety the biosphere. It refers to variability among plants animals and microorganisms species. Biodiversity includes the number of different organisms and their relative frequencies in an ecosystem. It also reflects the organisation of organisms at different levels. Biodiversity holds ecological and economical significance. It provides us with nourishments, housing, fuel, clothing and several other resources. It also extracts monetary benefits through tourism. Therefore, it is important to have a good knowledge about biodiversity for a sustainable livelihood.

(i) Genetic variation between distinct populations of the same species is known as:

a) Genetic diversity b) Species diversity

c) Ecosystem diversity d) Biodiversity

(ii) Steller's sea cow became extinct because

a) Global environmental changes

b) Over exploitation by humans

c) Invasion of non-native species

d) Pollution

(iii)Red data book deals with

a) Endemic plants

b) Plants that are extinct

c) Animals on the verge of extinction

d) Extinct plants and animal species

(iv)Which among the following is the last refuges for a large number of rare and threatened plants.

a) Sacred grooves

b) Botanical gardens

c) Sanctuaries

d) National parks

(v) Hotspots of biodiversity are

a) Where maximum species richness is found

b) Where maximum number of flora are found

c) Where maximum animal diversity is found

d) Where maximum natural resources are found

SECTION B

17 Classify the following contraceptive measures into different methods of birth control. 2

a) Saheli b) Tubectomy c) Diaphragms d) Lactational amenorrhea

18 How do drones develop in honey bees? Name the process. 2

19 Differentiate between endemic and exotic species. 2

20 One of the codons of mRNA is AUG. Draw the structure of tRNA adapter molecule for this codon. Mention the uniqueness of this RNA. 2

OR

Why does the toxin produced by *B. thuringiensis* not kill the Bacillus?

21 Explain the roles of the following with the help of an example each in recombinant DNA technology: (a) Restriction Enzymes (b) Plasmids 2

22 How has *Agrobacterium tumifaciens* been suitably modified to act as a cloning vector? 2

OR

You have developed a GM organism. Which government organisation will you approach to obtain clearance for its mass production? Write the roles of this organisation.

23 a) Cattle and goats not seen browsing on Calotropis growing in the fields. Give reason. 2
b) Give an example of an organism that enter into diapause.

24 Identify the features of a stable biological community. 2

25 Differentiate between in-situ and ex-situ approaches for conserving biodiversity. Give an example for each. 2

SECTION C

26 A true breeding pea plant homozygous for axial violet flowers is crossed with another pea plant with terminal white flowers (aavv) 3

a) What would be the phenotype and genotype of F1?

b) Give the phenotypic ratio of F2 generation.

27 Draw a flow chart to depict the multiplication of an HIV virus in a host cell. 3

28 Explain with the help of an example each any three ways the ecologists use to measure population density of different organisms rather than by calculating their absolute number. 3

OR

Given below is a table depicting population interactions between species A and species B.

TYPE OF INTERACTION	SPECIES A	SPECIES B
(a)	+	+
(b)	+	0

(i) Name and define the types of interactions (a) and (b) in the above table.
(ii) Write two examples of interaction (b) in nature.

29 Given below are the events in human reproduction. Write them in correct sequential order. 3
Insemination, gametogenesis, fertilization, parturition, gestation, implantation

30 In a bacterial culture some of the colonies produced blue colour in the presence of a chromogenic substrate and some did not due to the presence or absence of an insert (rDNA) in the coding sequence of β -galactosidase. (a) Mention the mechanism and the steps involved in the above experiment. (b) How is it advantageous over antibiotic resistant method? 3

SECTION D

31 (a) Draw the embryo sac of a flowering plant and label (i) central cell (ii) Chalazal end of the embryo sac (iii) synergids. (b) Name the cell that develops into the embryo sac and explain how this cell leads to the formation of Embryo sac. Also mention the fate of polar nuclei after fertilization. 5

OR

(b) Show diagrammatically the stages of embryonic development from zygote up to implantation in humans.

32 Name the genes that constitute an operon. How does lac operon get switched on in the presence of lactose? 5

OR

a) Compare the processes of DNA replication and transcription in prokaryotes.
b) Differentiate between exons and introns.

33 Discuss the role of lymphoids in the immune response. Explain the different types of lymphoid organs giving two example of each type in human. 5

OR

Explain the functioning of sewage treatment plants (STPs.)

End of the Question Paper