પુના International School

Shree Swaminarayan Gurukul, Zundal

Student Name					
Date	09/09/2020 (Wednesday)	Grade	XII	Roll No.	
Subject	Biology	Marks	80	Teacher's Sign	Time : 3 Hours

General instructions

1. **There are a total of 27 questions and five sections in each question paper. All questions are compulsory.**
2. **Section A contains 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 questions numbers from 13 to 21 ,short answer type II questions of three marks each.
   Section D contains question numbers from 22 to 24 , case based short answer type questions of three marks each.
   Section E contains question numbers from 25 o 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 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 o the question out of the two given in question paper with the same question number.**

SECTION A

1 Which of the following represents the female gametophyte in angiosperms?

(a) Embryo
(b) Embryo sac
(c) Synergid
(d) Endosperm

OR

How many functional sperms and how many ova will be formed by a primary spermatocyte and a primary oocyte, respectively?

a) One, One
(b) One, Four
(c) Four, One
(d) Four, Four

2 Genes are

(a) Segment of chromosome
(b) Segments of mitochondria
(c) Segment of nucleus
(d) Segment of DNA

OR

In the immune system, interferons are a part of

(a) physiological barriers
(b) cellular barriers

(c) physical barriers
(d) cytokine barriers.

3 The theory of use and disuse was given by
(a) Aristotle
(b) Lamarck
(c) Stebbins
(d) Vavilox

4 Semi-conservative replication of DNA was first demonstrated in

(a) Salmonella typhimurium
(b) Streptococcus pneumoniae
(c) Drosophila melanogaster
(d) Escherichia coli

5 . The development of fruits without fertilisation of the ovary, is called
(a) parthenogenesis
(b) parthenocarpy
(c) agamospermy
(d) apomixis

SECTION B

6 Name the organic materials of which exine and intine of an angiosperm pollen grains are made up of. Explain the role of exine

OR

Name any two organisms and the phenomenon involved where the female gamete undergoes development to form new organisms without fertilisation.

7 What is amniocentesis? How is it misused?

8 Mention the fate of corpus luteum and its effect on the uterus in the absence of fertilisation of the ovum in human female.

9The phenotypic and genotypic ratios in F2F2 generation are same in a certain kind of inheritance. Name and organism in which it occurs and mention the kind of inheritance .

10 What are vestigial organs? Give examples.

11 List two essential roles of ribosome during translation.

12 Differentiate between microsporogenesis and megasporogenesis. Which type of cell division occurs during these events? Name the structures formed at the end of these two events?

SECTION C

13 .Why are angiosperm anthers called dithecous? Describe the structure of its Microsporangium.

14 If implementation of better techniques and new strategies are required to provide more efficient care and assistance to people, then why is there a statutory ban on amniocentesis? Write the use of this technique and give reason to justify the ban.

OR

With a neat, labelled diagram, describe the parts of a typical angiosperm ovule.

15 Describe how the changing levels of FSH, LH and progesterone during menstrual cycle induce changes in the ovary and the uterus in human female?

16 Mention two functions of the codon AUG.

17 How does industrial melanism support Darwin's theory of natural selection explain?

18 Arrange the following in the decreasing order (most important first) of their importance, for the welfare of human society. Give reasons for your answer, Biogas, Citric acid, Penicillin and curd.

19 Write a short note on vaccination.

20 With a neat diagram explain the 7-celled, 8- nucleate nature of the female gametophyte.

OR

How many eggs are released by a human ovary in a month? How many eggs do you think would have been released if the mother gave birth to identical twins? Would your answer change if the twins born were fraternal?

21 Do you think that reproductive health in our country has improved in the past 50 years? If yes, mention some such areas of improvement

SECTION D

22 What is sewage? In which way can sewage be harmful to us?

23 Three water samples namely river water, untreated sewage water and secondary effluent discharged from a sewage treatment plant were subjected to BOD test. The samples were labelled A, B and C; but the laboratory attendant did not note which was which. The BOD values of the three samples A, B and C were recorded as 20 mg/L, 8 mg/Land 400 mg/L, respectively. Which sample of the water is most polluted? Can you assign the correct label to each assuming the river water is relatively clean?

24 If the sequence of one strand of DNA is written as follows:
5′-ATGCATGCATGCATGCATGCA
TGCATGC-3′
Write down the sequence of complementary strand in 5′ -> 3′ direction.

SECTION E

25 A flower of tomato plant following the process of sexual reproduction produce 240 viable seeds. Answer the following questions giving reasons:

(a) What is the minimum number of pollen grains that must have been involved in the pollination of its pistil ?
(b) What would have been the minimum number of ovules present in the ovary ?
(c) How many megaspore mother cells were involved ?
(d) What is the minimum number of microspore mother cells involved in the above case ?
(e) How many male gametes were involved in this case/

OR

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 single locus.

26 How did Hershey and Chase differentiate between DNA and protein in their experiment white proving that DNA is the genetic material?

OR

Arrange the following in the decreasing order (most important first) of their importance, for the welfare of human society. Give reasons for your answer. Biogas, Citric acid, Penicillin and Curd.

27 What is spermatogenesis? Briefly describe the process of spermatogenesis.

OR

What is oogenesis? Give a brief account of oogenesis.