



BK BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL

MID-TERM EXAMINATION 2023-24

BIOLOGY (044)



Class : XII
Date : 18.10.23
Admission No.:

Duration: 3 Hrs
Max. Marks: 70
Roll No.:

General Instructions:

- (i) This question paper consists of 33 questions. All questions are compulsory.
- (ii) Question paper is divided into five sections viz. A, B, C, D and E.
- (iii) Section A – question numbers 1-12 are multiple choice questions and 13-16 are assertion & reason, carrying 1 mark each.
- (iv) Section B – question numbers 17-21 are Very short Answer type questions carrying 2 mark each. Answers to these questions should be in the range of 30 to 50 words.
- (v) Section C – question numbers 22-28 are short Answer type questions carrying 3 mark each. Answers to these questions should be in the range of 50 to 80 words.
- (vi) Section D – question numbers 29-30 are 3 Case Based units of assessment having 4 questions carrying 1 or 2 mark each.
- (vii) Section E – question numbers 31-33 are Long Answer type questions carrying 5 marks each. Answers to these questions should be in the range of 80 to 120 words.
- (viii) There is no overall choice. However, an internal choice has been provided in some questions. A student is expected to attempt only one of these questions.

Section–A

(Select and write one most appropriate option out of the four options given for each of the questions 1-12 of 1 mark each)

1. Which of the following fruit is produced by parthenocarpy? 1
(a) Brinjal (b) Apple (c) Banana (d) Jackfruit
2. The method of directly injecting a sperm into ovum in assisted reproductive technology is called _____. 1
(a) GIFT (b) ZIFT (c) ICSI (d) ET
3. Cryptorchidism is a condition where _____. 1
(a) One of both testes are not developed
(b) One or both testes fail to descend into the scrotum
(c) One or both testes are not formed
(d) None of the above
4. After ovulation Graafian follicle regresses into _____. 1
(a) Corpus atresia (b) corpus callosum (c) corpus luteum (d) corpus albicans
5. From the sexually transmitted diseases mentioned below, identify the one which does not specifically affect the sex organs. 1
(a) Syphilis (b) AIDS (c) Gonorrhoea (d) Genital warts
6. Colour blindness is an _____ linked recessive trait. 1
(a) Z chromosome (b) Y chromosome (c) X chromosome (d) None of the above
7. Hershey and Chase's experiment was based on the principle _____. 1
(a) Transformation (b) Translation (c) Transduction (d) Transcription

8. The primer in DNA replication is _____. 1
 (a) Small ribonucleotide polymer (b) Helix destabilizing protein
 (c) Small deoxyribonucleotide polymer (d) Enzyme joining nucleotides of new strands
9. The theory of spontaneous generation stated that _____. 1
 (a) life arose from living forms only
 (b) life can arise from both living and non-living
 (c) life can arise from non-living things only
 (d) life arises spontaneously, neither from living nor from the non-living.
10. Paleontological evidences for evolution refer to the _____. 1
 (a) development of embryo (b) homologous organs
 (c) fossils (d) analogous organs.
11. The substance produced by a cell in viral infection that can protect other cells from further infection is _____. 1
 (a) serotonin (b) colostrum (c) interferon (d) histamine.
12. Humoral immunity is associated with _____. 1
 (a) T-cells (b) B-cells (c) macrophages (d) both (a) and (b)

Directions: In each of the following questions 13-16, a statement of Assertion is given, and a corresponding statement of Reason is given just below it. Of the statements, given below, mark the correct answer as:

- (a) Both assertion and reason are true, and reason is the correct explanation of assertion.
 (b) Both assertion and reason are true, 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: Autogamy is a transfer of pollen grains from an anther to the stigma of the same flower on the same plant. 1
 Reason: Xenogamy is pollination between two flowers on different plants.
14. Assertion: Gametes receives only one allele of a gene. 1
 Reason: During gamete formation, mitosis takes place leads to formation of haploid cells.
15. Assertion: The two chains of DNA have anti-polarity. 1
 Reason: In one chain of DNA, ribose sugar at 5' end consists of a free phosphate moiety while at the other end the ribose has a free 3' OH group. 1
16. Assertion: Plasmodium vivax is responsible for malaria. 1
 Reason: Malaria is caused by polluted water.

Section-B

(Q.no.17-21 are very short answer questions of 2 marks each)

17. Explain the different parts of the human sperm with a neat labelled diagram. 2
18. How many kinds of phenotype would you expect in F₂-generation in a monohybrid cross exhibiting codominance? 2
19. Lactational amenorrhea is a contraceptive method. List two advantages. 2
20. How is convergent evolution different from divergent evolution? 2
21. Differentiate between active & passive immunity? 2

OR

Breast-fed babies are more immune to diseases than bottle-fed babies. Why?

Section– C

(Q.no.22-28 are short answer questions of 3 marks each)

22. What is menstrual cycle? State the significance of the following stages during the lifetime of a female:
- (a) Menarche (b) Menopause 3
23. Differentiate between Polygenic inheritance and pleiotropic inheritance. 3
24. Why is the Human Genome project called a mega project? 3
25. What is Pollination? List out the agents of pollination. 3
26. Write differences between two surgical methods of contraception. 3
27. Write brief account of origin and evolution of Man. 3

OR

- State postulates of Oparin and Haldane's theory with reference to the origin of life.
28. Draw labelled diagram of structure of antibody .Write characteristics of an antibody. 3

Section– D

(Q.no.29-30 are case based questions of 4 marks each)

29. The endosperm makes the main source of food for the embryo. Generally the endosperm nucleus divides after the division of the oospore, but in several cases the endosperm is formed to a great extent even before the first division of the oospore. There are three general types of endosperm formation: (a)nuclear type, (b) cellular type and (c) helobial type. The endosperm is usually triploid but haploid endosperm is also found. Endosperm may either be completely consumed by the developing embryo before seed maturation or it may persist in the mature seed. Based on endosperm, seeds may be endospermic or non- endospermic.
- (a). What is the ploidy of endosperm cell? 1
- (b). Mention the importance of endosperm. 1
- (c). Enlist the types of endosperms. 2

OR

- How is endosperm cell formed in an angiospermic ovule?
30. According to Hardy-Weinberg principle, the allele frequencies in a population are stable and remain constant through generations. When the frequency differs from the expected values, the difference indicates the extent (direction) of evolutionary change. Disturbance in the genetic equilibrium or Hardy-Weinberg equilibrium in a population can be interpreted as resulting in evolution.
- (a) Write the algebraic equation representing Hardy-Weinberg equilibrium. 1
- (b) How is evolutionary change indicated? 1
- (c) List the five factors that affect the genetic equilibrium. 2

OR

What is the effect of migration on genetic equilibrium?

Section–E

(Q.no.31-33 are Long answer questions of 5 marks each)

31. Explain in detail the various developmental stages of the zygote until implantation. 5

OR

Draw neat labelled diagram of human male reproductive system and explain the parts.

32. Using Punnett square show the F_2 result of a dihybrid cross where the pure breed parents have contrasting traits with reference to seed shape and seed colour in *Pisum sativum*. Give the phenotypic ratio. 5

OR

(a). A couple with blood group A and B, respectively have a child with blood group O. Workout a cross to show how it is possible, and the probable blood groups that can be expected in their other offspring. 3

(b). Explain the genetic basis of blood groups in human population. 2

33. Describe the structure of a nucleosome with a labelled diagram of a nucleosome. 5

OR

Explain the experiment performed by Frederick Griffith on *Streptococcus pneumoniae*.

=====: **BEST OF LUCK** :=====