



# BK BIRLA CENTRE FOR EDUCATION

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

PRE BOARD EXAMINATION – 2023-24

## BIOLOGY (044)



Class : XII sci  
Date : 21.12.23  
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. Androgens are synthesized by \_\_\_\_\_. 1  
a.) Sertoli Cells    b.) Leydig cells    c.) Seminal vesicles    d.) Bulbourethral gland
2. A procedure that finds use in testing for genetic disorders, but is also misused for female foeticide is \_\_\_\_\_. 1  
a.) Lactational amenorrhea    b.) Amniocentesis  
c.) Artificial insemination    d.) Parturition
3. Which type of immune response is responsible for the rejection of tissues/organs in the patient's body post transplantation? 1  
a.) auto-immune response    b.) humoral immune response  
c.) physiological immune response    d.) cell-mediated immune response
4. Which among the following is the producer of citric acid. 1  
a) Rhizopus    b) Trichoderma    c) Penicillium notatum    d) Aspergillus niger
5. 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

6. The most important cause of biodiversity loss is: \_\_\_\_\_ . 1  
 a.) Over exploitation of economic species  
 b.) Habitat loss and fragmentation  
 c.) Invasive species  
 d.) Breakdown of plant-pollinator relationships
7. The meiocyte of rice has 24 chromosomes. The number of chromosomes in its endosperm is 1  
 a) 24            b) 12            c) 48            d) 36
8. The process of evolution of different species in a geographical area starting from a point and radiating to other areas of geography is called – 1  
 a) Founder effect b) Adaptive radiation c) Convergent evolution d) Saltation
9. Bt toxin is produced by a bacterium called \_\_\_\_\_. 1  
 Lacto bacillus      b) Bacillus      c) Bacillus tumifaciens      d) Bacillus thuringiensis
- 10 Agarose extracted from sea weeds is used in 1  
 (a) Spectrophotometry      (b) tissue culture      (c) PCR      (d) gel electrophoresis
11. 14. Which type of association is found in between entomophilous flower and pollinating agent? 1  
 a) Mutualism      b) Commensals      c) Co-operation      (d) Co-evolution
- 12 .Which one of the following hormones is responsible for uterine contractions during parturition? 1  
 a. relaxin            b. vasopressin            c. oxytocin            d. prolactin

*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 : Person suffering from Elephantiasis exhibits swollen limbs .  
 Reason: The causative worms block the flow of lymph in the body due to their accumulation in the lymph nodes. 1
- 14 Assertion: Human insulin can be produced into bacterial cells using biotechnology  
 Reason :To produce human insulin the A, B and C polypeptides of the human insulin are produced separately in the bacterial cells, extracted and combined by creating di sulphide bond 1
15. Assertion: Habitat destruction is the main reason for the loss of biodiversity.  
 Reason: This actually causes an increase in the edge area and a reduction in the core area. 1
- 16 Assertion: yeasts such as Saccharomyces cerevisiae are used in baking industry.  
 Reason: Carbon dioxide produced during fermentation causes bread dough to rise by thermal expansion. 1

## SECTION B

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

17. How does an encysted *Amoeba* reproduce on return of favourable conditions? 2
- OR
- What are gemmules and conidia? Name one organism each in which these are formed?
18. Name any two copper releasing IUD's. State how they act as a contraceptive. 2
19. Why is it not possible to study the pattern of inheritance of traits in human beings, the same way as it is done in pea plant? Name the alternate method employed for such an analysis of human traits.
20. How is the sex of the child determined in human beings? 2
21. Explain the events that occur in the host cell on introduction of nematode-resistant gene into the tobacco plant by using *Agrobacterium* vectors. 2

## SECTION C

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

22. Construct a pyramid of biomass starting with phytoplankton. Label its three trophic levels. Is the pyramid upright or inverted? Justify your answer. 3
23. Draw a well-labelled diagram of L.S of a pistil of a flower showing the passage of growing of pollen tube up to its destination. 3
24. How does gain or loss of chromosome(s) takes place in humans? Describe one example each of chromosomal disorder along with the symptoms involving an autosome and a sex chromosome. 3
- OR
- A small stretch of DNA strand that codes for a polypeptide is shown below:  
3'--- --- --- --- CAT CAT AGA TGA AAC--- --- --- --- 5'
- a) Which type of mutation could have occurred in each type resulting in the following mistakes during replication of the above original sequence?
- i. 3`... .. ...CAT CAT AGA TGA ATC... .. ...5`
- ii. 3`... .. ...CAT ATA GAT GAA AC... .. ... 5`
- b) How many amino acids will be translated from each of the above strands i) and ii)?
- c) Mention names of some known amino acids
25. "Apomixes is a form of asexual reproduction that mimics sexual reproduction in plants". Explain with the help of a suitable example. 3
26. How is inbreeding advantageous as well as disadvantageous in cattle breeding programme? (Mention any two advantages and two disadvantages ) 3
27. "Specific Bt Toxin gene is incorporated into cotton plant so as to control infestation of Bollworm". Mention the organism from which the gene was isolated and explain its mode of action. 3
28. What are State any two criteria for determining biodiversity hotspots. Name any two hotspots designated in India. 3

## OR

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

## SECTION D

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

29. Hybridisation experiment carried out by Mendel where he crossed tall and dwarf pea plants to study the inheritance of one gene. He collected the seeds produced as a result of this cross and grew them to generate plants of the first hybrid generation. This generation is also called the Filial1 progeny or the F1. Mendel observed that all the F1 progeny plants were tall, like one of its parents; none were dwarf (Figure 5.3). He made similar observations for the other pairs of traits – he found that the F1 always resembled either one of the parents, and that the trait of the other parent was not seen in them.
- a. If a plant heterozygous for tallness is selfed, the F2 generation has both tall and dwarf plants. Which law of inheritance does it prove? 1
- b. What does F1 stand for? 1
- c. What were the 2 observations made by Mendel? 2

OR

What is hybridisation? Name the two types of cells formed after hybridisation.

30. Some restriction enzymes break a phosphodiester bond on both the DNA strands, such that only one end of each molecule is cut and these ends have regions of single stranded DNA. BamH1 is one such restriction enzyme which binds at the recognition sequence, 5'-GGATCC-3' and cleaves these sequences just after the 5'-guanine on each strand
- a) Explain how the gene of interest is introduced into a vector. 1
- b) What are restriction enzymes? 1
- c) Which is the recognition sequence of BamH1? Mention it. 2

OR

What is a phosphodiester bond? Where is it present?

## SECTION E

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

31. With reference to Spermatogenesis and Oogenesis answer the following questions:
- a.) About 300 million spermatozoa may be present in a human male ejaculation at one time. Calculate how many spermatocytes will be involved to produce 300 spermatozoa. 1
- b.) How many chromosomes are found during Oogenesis in Primary oocyte? 1
- c) When does meiosis II take place in oogenesis? 1
- d) Name the hormone secreted by hypothalamus which stimulates the process of spermatogenesis. 1
- e) Which is the hormone which stimulates both Spermatogenesis and Oogenesis. 1

OR

With diagram Explain the human male reproductive system 5

32. Explain Amplification of gene of interest using PCR technique. mention any two uses . 5

OR

Explain the process of DNA technology with diagram. 5

33. a. Give reason :

1) Why HIV is called human immune deficiency virus. ? 1

2) Why cancer is called the most dreaded disease? 1

3) Why malarial parasite ,Plasmodium needs two hosts ? 1

4) Why vaccines are used to treat diseases? 1

b. differentiate between AMI and CMI. 1

OR

Explain the life cycle of malarial parasite in 2 hosts. 5

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