

BAL BHARATI PUBLIC SCHOOL
Sample Question Paper 2020-21
Class XII
Biology (044) Theory

Time: 3 Hours

Maximum 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

- Q1. Lactational amenorrhea is a natural method of contraception. How does this method work?
- Q2. How many meiotic divisions are required to produce 76 seeds in guava plant?
- Q3. How primary oocyte gets converted into secondary oocytes inside tertiary follicle?
- Q4. If the frequency of parental form is higher than 25% in a dihybrid cross what does that indicate about the two genes involved?
- Q5. The egg of an animal contains 10 chromosomes of which one is X chromosome. How many autosomes would be there in the karyotype of this animal?
- Q6. Mention the popular use of nucleopolyhedroviruses now a days.
- Q7. Name the type of cells the AIDS virus enters into after getting in the human body.
- Q8. Why do children cured by enzyme replacement therapy for adenosine deaminase deficiency need periodic treatment?
- Q9. How does an alien DNA gain entry into a plant cell by biolistics method?
- Q10. How can bacterial DNA be released from the bacterial cell for biotechnology Experiments?

In the following questions a statement of Assertion followed by a statement of reason is given. Choose the correct answer out of the following choices:

A - Assertion and reason both are correct statements and reason is correct explanation for assertion.

B - Assertion and reason both are correct statements but reason is not correct explanation for assertion.

C - Assertion is correct statement but reason is wrong statement.

D - Assertion is wrong statement but reason is correct statement.

Q11. Assertion: For organ transplantation cyclosporin A needs to be injected to the patient.

Reason: Cyclosporin A inhibits activation of T cells and interferons.

Or

Assertion: Acetic acid production involves both Aerobic and anaerobic processes.

Reason: First alcohol is produced from glucose by Aerobic process which is followed by production of acetic acid by anaerobic process.

Q12. Assertion: In Griffiths experiment the mixture of heat killed virulent R bacteria and live non virulent S bacteria led to the death of mice.

Reason: The transforming principle got transferred from S strain to heat killed R strain and made it virulent.

Q13. Assertion: Eukaryotic mRNA requires post transcriptional modifications to form functional mRNA.

Reason: Eukaryotic transcripts possess extra nonfunctional gene segments called introns.

Q14. Assertion: Proto oncogenes are cellular genes required for normal growth.

Reason: Under certain conditions they lead to the oncogenic transformation of the cell.

*Read the following and answer any **four** questions from 15(A) to 15(E) given below:*

Q15. In grassland, grasses are dominant with nongraminaceous herbs mostly leguminous scattered bushes and occasional tree, e.g. prairies of USA/Canada, pampas of South America, steppes of Eurasia, tussocks of New Zealand, downs of Australia and veldts of South Africa. There is hot summer, cold winter, seasonal 25-75 cm rainfall. Rainfall is short of forming forests and more than the amount that induces desert formation. Grasses can be sod formers or grow in bunches. Height of grasses varies from a few centimeters to 1.5 m in moist regions. Shoot biomass is 50-1000 gm/m². Primary productivity is related to rainfall. Root system is extensive grazing and fire help maintain grassland and prevent woody species to invade the area fauna consists of deer, elk bison, Wolf, Prairie dog, bear bighorn sheep, rabbit, mice, budges, coyote, burrowing owl.

A. Grasslands are dominated mostly by leguminous herbs. The most significant ecological advantage of these herbs in grasslands is:

- i) Increase in nitrogen fertility of the soil.
- ii) Increase in diversity of fauna.
- iii) Increase in primary productivity.
- iv) Decline in phosphorus content of the soil.

B. Grasslands are devoid of trees. According to the study the major reason for the same is:

- i) Less fertile soil.
- ii) Less rainfall.
- iii) Less solar radiation's reaching to the grasslands.
- iv) Deforestation

C. The vegetation in grassland is characterized by

- i) Scattered bushes with less developed shoot system and extensive root system.
- ii) Few huge trees with well-developed canopy.
- iii) Xerophytes and succulents with reduced leaves.
- iv) Extensive growth of herbs and shrubs.

D. Choose the appropriate latitude at which grasslands are present:

- i) 71.21°N
- ii) 25.55°N
- iii) 23.51°N
- iv) 55.5°N

E. State one difference between vegetation of grasslands and savannahs.

*Read the following and answer any **four** questions from 16(A) to 16(E) given below:*

Q16. Robert Koch (1843 to 1910) the first proof that bacteria actually causes diseases came from Robert Koch in 1876 he formulated Koch's postulate which are as follows:

- 1) The organism or pathogen must be regularly found in the body of the animal that is suffering from a disease.
- 2) The organism must be isolated that grow in pure culture or artificial media.
- 3) The same disease must be produced when the cultured organisms are injected into other healthy animals.

4) The same organism must be recovered from the injected animals.

Exceptions to Koch's postulates. These postulates originally were applied for animal diseases but are equally applicable for human diseases. However Koch's postulates are not applicable to viral diseases and bacteria of leprosy because virus and *Mycobacterium leprae* cannot be cultured on artificial media.

A. a) Koch's postulates are not applicable to viral diseases because:

- i) Viruses cannot be cultured in artificial media
- ii) Koch's postulates are true only for animal diseases.
- iii) Viral diseases were not known to Koch.
- iv) Viruses are non-living creatures.

B. Which of the following is incorrect about Koch's postulate.

- i) The organism must be regularly found in the body of the animal that is suffering from the disease.
- ii) The Organism must be isolated and can be grown in pure culture or artificial media.
- iii) The same disease must be produced when the cultured organisms are injected into healthy animals.
- iv) The Organism may or may not be recovered from the injected animals.

C. Select name of the disease for which Koch's postulate will **not** hold true:

- i) Amoebiasis
- ii) Cholera
- iii) Typhoid
- iv) Phenylketoneuria

D. Which of the following disease will help in development of acquired immunity?

- i) Beri Beri
- ii) Cancer
- iii) Allergy towards dust particles
- iv) Mumps

E. State one difference between vector and a pathogen.

Section B

Q17. Describe the mechanism of action of Copper T as contraceptive method.

Q18. Differentiate between perisperm and endosperm along with one example of each.

OR

How will you differentiate between wind pollinated flowers and insect pollinated flowers?

Q19. Explain any two devices by which autogamy is prevented in flowering plants.

OR

State one advantage and one disadvantage of cleistogamy.

Q20. The recognition site of Bam HI in the given sequence is between A and A-

5' AAGCTT 3'

3' TTCGAA 5'

The recognition site of Bal I in the given sequence is between G and C. Based on the information, answer the following:

- i) How the end product produced after the action of these enzyme is going to be different from each other?
- ii) What is the significance of difference in the end product obtained for recombinant DNA technology?

Q21. List the type of cry genes respectively that provide resistance to corn plants and cotton plants respectively against lepidopterns.

Q22. What are sacred grooves? Give example of two such places from India.

Q23. Draw age pyramids for human population showing following growth status:

- i) Expanding in future.
- ii) Declining in future

Q24. Predation is usually referred to as a detrimental association. State any two positive roles played by predator in an ecosystem.

Q25. Mention the level of biodiversity in each of the following cases:

- i) India has more than 50,000 strains of rice.
- ii) Variation in terms of potency and concentration of reserpine in rauwolfia vomitoria growing in different regions of Himalayas.
- iii) Estuaries and Alpine Meadows in India.
- iv) Western Ghats have greater amphibian diversity than Eastern Ghats.

Section C

Q26. With the help of one example each explain the phenomenon of co-dominance and multiple allelism in human population.

Q27. While observing the karyotype of a human male, one extra X chromosome was found. Name the genetic disorder the person is suffering from. Give the karyotype of the person and explain at least four symptoms related to the disorder.

Or

Qa) Explain how a single point mutation causes sickle cell anemia in case of human beings?

b) Write the genotype of both the parents who were appearing normal but produced a sickle celled offspring.

Q28. Explain the mechanism of sex determination in insects like Drosophila and Grasshopper.

Q29. a) Describe the role of Thymus gland as a lymphoid organ.

b) Name the cells that are released from Thymus gland for immune reactions.

c) How do cells released from thymus gland helps in providing immunity?

Q30. Anabaena, Mycorrhiza, Trichoderma are suitable for organic farming which is in great demand these days for various reasons. Mention one application of each of these microbes which makes it suitable for organic farming.

Section D

Q31. a) How is placenta formed in the human female?

b) Explain various functions performed by placenta.

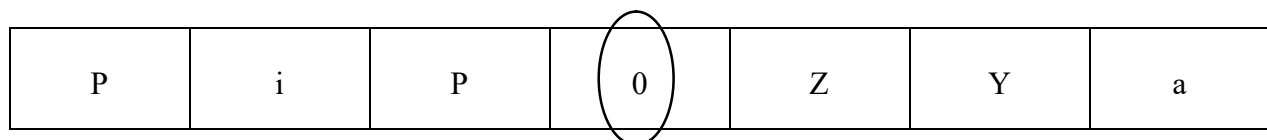
c) What happens to placenta after parturition?

OR

a) How are assisted reproductive technologies helpful to humans? How are ZIFT and GIFT different from intra uterine transfers? Explain.

b) Mention a condition in which embryo is transferred into the uterine cavity of a female other than the biological mother of the child.

Q32. Observe the representation of genes involved in the Lac operon given below:



- a) Identify the region where the repressor protein will attach normally.
- b) Under certain conditions repressor is unable to attach at this site. Explain.
- c) If repressor fails to attach to the said site what products will be formed by z and a.
- d) Explain why this kind of regulation is called negative regulation?
- e) What is the significance of negative regulation in Lac operon?

OR

Q. Beadle and Tatum reported that chromatin fibers look like beads on a string. What are these beads known as? Explain the structure and formation of these beads. Why DNA is being packed in such a manner?

Q33. a) Name and explain the process by which recombinants and non-recombinants are differentiated on the basis of color production in the presence of a chromogenic substrate.

- b) Describe the temperature treatment that enables the bacteria to take up recombinant DNA.

OR

- Q.
- a) Expand the term GEAC and explain its objectives.
 - b) Describe any four advantages of genetically modified organisms.