

KENDRIYA VIDYALAYA SANGATHAN

I Pre Board Exam
SESSION: 2020-21
Class – XII
SUBJECT: BIOLOGY

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 of 4 marks each. 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. Between amphibians and birds which will be able to cope with global warming? Give reason.
- Q2. What is the linkage between nitrogenous base and pentose sugar called?
- Q3. How is the bacterium *Thermus aquaticus* employed in recombinant DNA technology?
- Q4. A woman's husband is infertile, so the lady has decided to have baby by taking sperms from sperm bank. Which technique will you suggest for her pregnancy?
- Q5. The meiocyte of rice has 24 chromosomes. How many chromosomes are present in its endosperm?
- Q6. What stimulates pituitary to release the hormone responsible for parturition?
- Q7. Give an example of a plant which came into India as a contaminant and is a

cause of pollen allergy.

- Q8. What was speciality of the milk produced by the transgenic cow Rosie?
- Q9. Suggest a technique to a researcher who needs to separate fragments of DNA.

Q10. State the role of C peptide in human insulin.

Q11. **Assertion:** Haemophilia shows criss-cross inheritance.

Reason: The gene that causes Haemophilia is recessive and lies in the X-sex chromosome.

- 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) Both assertion and reason are false

Or

Assertion: A gamete contains a single allele for each trait.

Reason: During gametogenesis, the two alleles of each trait segregate, one passing into each gamete at random.

- 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) Both assertion and reason are false

Q12. **Assertion:** Alcoholism and tobacco smoking are regarded social diseases.

Reason: Both adversely affect the individuals and their families.

- 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) Both assertion and reason are false

Q13 **Assertion:** The cut pieces of DNA are linked with plasmid DNA.

Reason: Plasmid DNA fails to act as vectors.

- 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) Both assertion and reason are false.

Q14 **Assertion:** Yeasts should not be used in brewing and baking industries.

Reason: They produce several harmful products during brewing and baking.

- 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) Both assertion and reason are false

Q15. Read the following and answer any four questions 15(i) to 15(v) given below:

Morgan worked with the tiny fruit flies, which were found very suitable for such studies. They could be grown on simple synthetic medium in the laboratory. They complete their life cycle in about two weeks, and single mating could produce a large number of progeny flies. Male and female flies are easily distinguishable. Also it has many types of hereditary variations that can be seen with low power microscopes.

- i) Lack of independent assortment of two genes A and B in fruit fly *Drosophila* is due to
 - a) Recombination
 - b) Linkage
 - c) Crossing over
 - d) Repulsion
- ii) Test cross in plants or in *Drosophila* involves crossing
 - a) Between two genotypes with recessive trait
 - b) Between two F1 hybrids
 - c) The F1 hybrid with a double recessive genotype
 - d) Between two genotypes with dominant trait

- iii) Chromosomal theory of inheritance was proposed by_____
- a) Sutton in 1902
 - b) Boveri in 1902
 - c) Correns in 1909
 - d) Sutton and Boveri in 1902
- iv) What is the number of linkage groups in the *Drosophila*?
- a) Two
 - b) Four
 - c) Eight
 - d) None of the above
- v) **Assertion:** *Drosophila melanogaster* is widely used in genetic research
- Reason:** *Drosophila melanogaster* is a readily available insect.
- 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) Both assertion and reason are false

Q16. Read the following and answer any four questions 16(i) to 16(v) given below: Some organisms are able to maintain homeostasis by physiological means which ensures constant body temperature, constant osmotic concentration, etc. All birds and mammals, and a very few lower vertebrates and invertebrates species are indeed capable of such regulation. Evolutionary biologists believe that the success of mammals is largely due to their ability to maintain a constant body temperature and thrive whether they live in Antarctica or in Sahara Desert.

Thermoregulation is energetically expensive for many organisms. This is particularly true for small animals like shrew and humming birds. Heat loss or heat gain is a function of surface area. Since small animals have a larger surface area relative to their volume, so they tend to lose body heat very fast when it is cold outside, then they have to expend much energy to generate body heat through metabolism.

- i) While heat gain or heat loss is the function of _____ heat production is the function of _____ of the body of an animal.
- Volume; Surface area
 - Surface area; Volume
 - Volume; Volume
 - Surface area; surface area
- ii) Animals from colder climates generally have smaller limbs. This is called
- Niche rule
 - Allen's rule
 - Ehrlich
 - None of these
- iii) Shivering during cold is beneficial for mammals. It helps to
- Decrease body temperature
 - Increase body temperature
 - Decrease rate of metabolism
 - None of the above
- iv) Their body temperature
- Do not change with the ambient temperature.
 - Changes irrespective of ambient temperature
 - Changes with the ambient temperature.
 - None of the above
- v) **Assertion:** An overwhelming majority of animals and nearly all plants cannot maintain a constant internal environment.
Reason: These animals are simply conformers
- Both assertion and reason are true and reason is the correct a explanation of assertion.
 - Both assertion and reason are true but reason is not the correct explanation of assertion .
 - Assertion is true but reason is false .
 - Both assertion and reason are false.

SECTION –B

Q17. Draw a labelled schematic sketch of Replication fork of DNA.
Or

Draw a schematic diagram of a transcription unit with the polarity of the DNA strands and label coding strand ,template strand and

terminator .

Q18. Differentiate between chasmogamous and cleistogamous flowers.

Do you think cleistogamy is advantageous to plants. If yes how?

Or

Why is CuT considered a good contraceptive device to space children?

Q19. Name a disease for which gene therapy has been done. How gene therapy is done to cure this disease?

Q20. Write the difference between incomplete dominance and co-dominance. Give one example of each.

Q21. Which microbe is used in manufacturing Swiss cheese? How the holes get created?

Q22. Give three hypotheses for explaining “Why tropical regions show greatest levels of species richness”?

Q23. Name the causal organism of

- a) Filariasis
- b) Pneumonia
- c) Common cold
- d) Ring worm

Q24. Using conventional methods of diagnosis (serum and urine analysis etc.) early diagnosis of a disease is not possible. Write two techniques that serve the purpose of early diagnosis.

Q 25. Define diapause and give one example of it .

Section –C

- Q26. What is apomixis? Write two ways of development of apomictic seeds?
- Q27. Write the source organism and medicinal use of the following products.
- i. Streptokinase
 - ii. Cyclosporin A
 - iii. Statins

- Q28. A couple with normal vision bear a colour blind child work out the cross to show how it is possible and mention the sex of the child.

Or

Write three points of difference between Turner and Klinefelter syndrome.

- Q29. Selection of recombinants due to inactivation of antibiotics is a cumbersome procedure. Therefore alternative selectable markers have been developed which differentiates recombinants from non-recombinants on the basis of colour change. Describe this method.

- Q30. Name the interaction in each of the following :-
- i. Wasp Laying eggs in a fig fruit
 - ii. Cuckoo(Koel) lays its egg in crow's nest.
 - iii. Plasmodium reproduces asexually in liver cell of human being.
 - iv. Orchid growing as epiphyte on mango branch.
 - v. Herbivores eat plants.
 - vi. Mycorrhizae are associations between fungi and the roots of higher plants.

SECTION-D

- Q31. a) Make a flow chart to show the process of spermatogenesis in humans.
b) Draw a well labelled diagram of human sperm.

OR

- a) Draw a labelled diagram of the sectional view of a typical anatropous ovule.
b) Mention the fate of all the components of the embryo sac after fertilization?

- Q32. Why is that once a person starts taking alcohol or drugs, it is difficult to get rid of this habit? How this habit can be prevented or controlled.

Or

Explain the stages in the life cycle of malarial parasite with the help of diagram.

- Q33. How did Hershey and Chase proved that DNA is transferred from virus to bacteria?

Or

- a) Write the cause of thalassemia. Why does a patient requires frequent blood transfusion in this disease?
b) Give one example of pleiotropy and explain.