



INDIAN SCHOOL AL WADI AL KABIR
SAMPLE PAPER 1
Class: XII - BIOLOGY (044) – SET I

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

1. What is the significance of two types of flowers produced in Oxalis and Commelina.
2. In relation to the endosperm, in tender coconut how will you distinguish the coconut water and the white kernel surrounding it.
3. How many meiotic divisions are required to produce 84 seeds in a jackfruit?
4. Name the Pituitary hormone that act on Leydig cells which contribute to the synthesis of which hormone from the cells.
5. What type of inheritance does snapdragon show and name the colour of the flower produced in the F1 progeny
6. Differentiate between Mendelian disorders and chromosomal disorders.
7. Predict the effect if, the codon UAC coding for an amino acid at the 15th position of a polypeptide of 40 amino acids, is mutated to UAG.
8. How is mature insulin different from pro-insulin?
9. What are the main features in vectors engineered nowadays, used in rDNA technology.
10. Why does India have a greater ecosystem diversity as compared to Norway.

11. **Assertion:** A codon is unambiguous

Reason: Some amino acids are coded by more than one codon

- 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: Amino acids are added one by one and translated into a polypeptide.

Reason: The ribosome moves from codon to codon along the mRNA

- Both assertion and reason are true, and the reason is the correct explanation of the assertion.
- Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
- Assertion is true but reason is false.
- Both assertion and reason are false

12. **Assertion:** *E. coli* having pBR322 with DNA insert at Pst I site cannot grow in medium containing ampicillin

Reason: Recognition site for Pst I is present in amp^R region of pBR322.

- Both assertion and reason are true, and the reason is the correct explanation of the assertion.
- Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
- Assertion is true but reason is false.
- Both assertion and reason are false

13. **Assertion:** The Logistic growth model is considered a more realistic growth

Reason: Since resources for growth are infinite in a population.

- Both assertion and reason are true, and the reason is the correct explanation of the assertion.
- Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
- Assertion is true but reason is false.
- Both assertion and reason are false

14. **Assertion:** In *Ophrys* one petal of the flower bears an uncanny resemblance to the female bee.

Reason: This shows how co-evolution operates

- Both assertion and reason are true, and the reason is the correct explanation of the assertion.
- Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
- Assertion is true but reason is false.
- Both assertion and reason are false

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

Types of Pollination

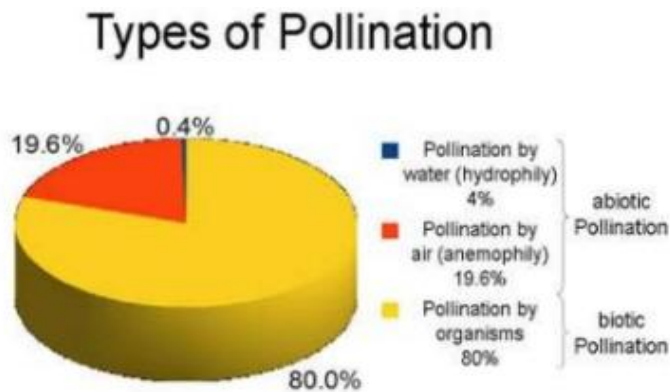
Pollination is the transfer of pollen grains from the anther of one flower to the stigma of the same or another flower. It is said to be the first process of sexual fertilization in flowering plants.

In self-pollinating plants, there is less dependence on the external factors to cause pollination.

Hydrophilous Flowers-These flowers are pollinated by water means. The flowers are often very small and inconspicuous They do not have any fragrance or too much color on their petals.

Zoophilous flowers– In this type of pollination, the pollinating agents are animals the

zoophilous flowers have pollen that is designed to stick on to the body of the animal so that they can be easily carried from one flower to another. **Anemophilous flowers** – These flowers are pollinated by the agency of wind. These flowers, are small and inconspicuous. The pollen grains are very light, non-sticky and sometimes winged. **Entomophilic flowers** – These flowers are pollinated by insects. These flowers are often attractive to look at with bright petals and are fragrant to attract the insect. Many of the insect-pollinated flowers also secrete pollen grains in these flowers are often spiny or have extensions that help them to stick on to the body of the insects.



i) From the pie chart given above the percentage of pollination by organism is highest because

- Flowers provide floral rewards to the pollinators
- Many insect pollinated flowers look attractive
- Many insect pollinated flowers are fragrant
- Flowers look attractive, are fragrant and provide floral rewards to the pollinators

ii) The approach to include growing fruits and flowers as a part of modern scientific agriculture while growing crop plants is:

- To help the farmers to get added income by selling them
- To attract pollinators in the farm.
- To supply fresh fruits and flowers to the local market
- All of them

iii) Two important prefertilisation events for sexual reproduction to take place is

- Gamete formation and pollination
- Formation of flower and inflorescence
- Zygote formation and embryogenesis
- Seed and endosperm formation

iv) Anemophilous flowers are pollinated by

- Insects
- Wind
- Water
- Animals

v) **Assertion: Hydrophilous Flowers**-These flowers are pollinated by water means are often very small, inconspicuous, nonfragrant and colorless.

Reason: They produce large pollen grains to compensate for wastage

- a) Both assertion and reason are true, and the reason is the correct explanation of the assertion.
- b) Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
- c) Assertion is true but reason is false.
- d) Both assertion and reason are false

16. Read the following and answer any **four** questions from 16(i) to 16(v) given below:

Gene therapy is a medical technique, used to deal with genetic or congenital diseases. This therapy aims at correction of a genetic defect by delivery of a normal gene to an individual to take over or compensate the function of a non-functional gene.

The lymphocytes of a patient were grown in a culture in vitro. A functional ADA cDNA was introduced in these lymphocytes using a retroviral vector. The transformed lymphocytes were introduced back into the blood of the patient. The patient is regularly infused with transformed lymphocytes. For a permanent cure of ADA deficiency, a gene isolated from bone marrow cell is introduced in the patient in the early stage.

i) ADA disorder is caused due to----- for adenosine deaminase

- a) Addition of the gene
- b) Deletion of the gene
- c) Point mutation of the gene.
- d) Frame mutation of the gene.

ii) ADA enzyme is crucial for the ----- to function.

- a) Nervous system
- b) Blood clotting system
- c) Immune system
- d) Excretory system.

iii) A functional ADA cDNA is introduced into the lymphocytes using -----

- a) Plasmid vector
- b) Bacteriophage vector
- c) Retroviral vector
- d) Blood transfusion

- iv) The patient is regularly infused with transformed lymphocytes because
- a) Lymphocytes are not immortal
 - b) Lymphocytes are immortal
 - c) They are genetically engineered
 - d) None of these
- v) In conclusion a gene isolated from bone marrow cell is introduced in the patient in the early stage could be the permanent cure for this disease
- a) True
 - b) False
 - c) Partially true
 - d) None of the above.

SECTION – B

17. Name the oral pills for females that was developed in India by the CDRI, give reasons as to why it is well accepted by the females.
18. Karyotype of a child shows XXY with chromosome number 47. Identify the disorder and state the symptoms which are likely to be exhibited in this case.
19. Explain four features of Acquired Immunity.
20. Explain any two-method used to introduce alien DNA into a competent bacterial host cell to take up recombinant DNA?

OR

What are bioreactors? Briefly explain the Simple stirred tank bioreactor.

21. Explain why both the strands of DNA is not transcribed into mRNA.
22. Why should the DNA be cut by the same restriction enzyme, State the significance of this step-in recombination DNA technology.

OR

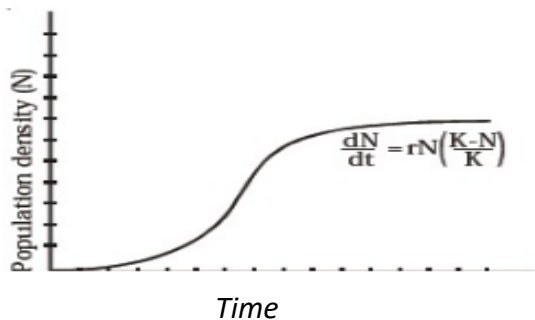
Explain the procedure by which PCR aids in early detection of HIV AIDS.

23. What is ex-situ technique of conservation, explain how advanced ex-situ conservation techniques assist in preserving threatened species of plants and animals.
24. Describe the different chemical defense mechanism with examples that the plants have developed against the herbivores.
25. Name the kind of interaction, built by a termite feeding on wood and the other is a protozoan residing in the gut of this termite, give reason for both the interactions.

SECTION – C

26. Illustrate the Life cycle of the Plasmodium in the secondary host.
27. Draw a neat and labelled diagram showing the structure of a sperm.
28. How would you find out the genotype of a tall pea plant at F₂? Explain with the help of Punnett's square showing crosses.
29. A farmer noticed that his cotton plant was getting infected by cotton bollworms which has reduced the yield of cotton. Suggest a strategy used in biotechnology which can save the farmers plant from the pest. Explain the technique.

30a) Interpret the following growth curve in relation to i) growth ii) K



b) State any two importance of predators in a community.

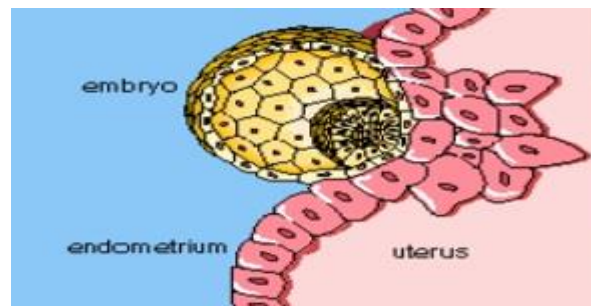
OR

Give reasons for the following:

- Desert lizards show behavioural response to cope with variations in their environment.
- What is the significance of genetic variation in the Rauwolfia vomitoria plant.
- Mammals from colder climates generally have shorter ears and limbs, State the Rule with a reason

SECTION – D

31. The following figure shows the implantation of the embryo within the uterus lining. On the basis of the given figure, answer the questions that follow:

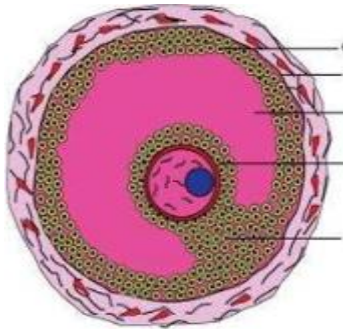


- Name the stage of the embryo at the time of implantation and what will implantation lead to.

- b) Briefly describe its structure of the embryo at this stage with the help of a neat labelled diagram.
- c) Briefly explain the formation of the placenta.
- d) Placenta also acts as an endocrine gland –comment with two examples.

OR

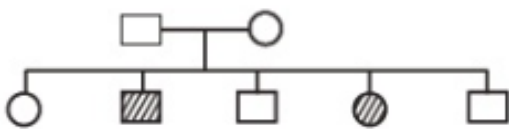
The following figure shows the structure of the Graafian follicle, On the basis of the given figure, answer the questions that follow:



- a) Briefly describe the structure of the Graafian follicle
- b) Identify and briefly describe the stage before the formation of the Graafian follicle.
- c) Explain the events that will follow after the Graafian follicle will burst.

32. The following pedigree shows a particular trait which is absent in the parents but found in the subsequent generation irrespective of the sexes.

- a) Analyze the pedigree and draw a conclusion.



- b) A colour-blind father has a daughter with normal vision. The daughter marries a man with a normal vision. What is the probability of her children to be colour blind? Explain with the help of a pedigree chart.
- c) Briefly explain why is sickle cell anemia an example of point mutation,

OR

- a) What is split gene arrangement.
- b) Explain the two additional steps in the process of transcription in Eukaryotes.

c)What is aminoacylation of tRNA and what is its importance in the process of translation.

33a) A person has chronic inflammation of the lower limbs, resulting in gross deformity as shown in the figure, answer the questions in relation to it



- i) Identify the disease and the causative organism of the disease.
 - ii) Where do the causative organism usually live and cause the inflammation.
 - iii) How is the disease transmitted.
- b) How do normal cells get transformed into cancerous cells?
- c)Mention the difference between viral oncogenes and cellular oncogenes.

OR

- a) Differentiate between primary lymphoid organs and secondary lymphoid organs.
- b) How does Spleen and MALT help the immune system of our body.
- c)What causes inflammatory response during an allergic reaction and name the antibody produced during this reaction.

Prepared by : The Department of Science 2020 -21
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