

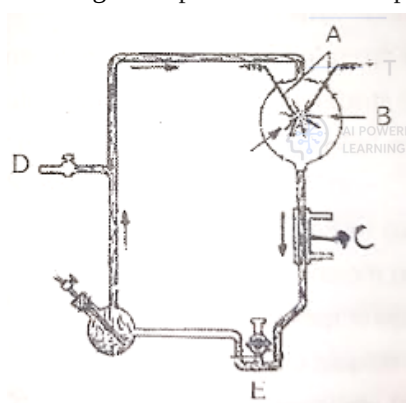
Class XII | Session 2026-27
Subject - Biology
Sample Question Paper - Set 1

General Instructions:

1. All questions are compulsory.
2. The question paper has five sections and 33 questions. All questions are compulsory.
3. Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.
4. 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.
5. Wherever necessary, neat and properly labeled diagrams should be drawn.

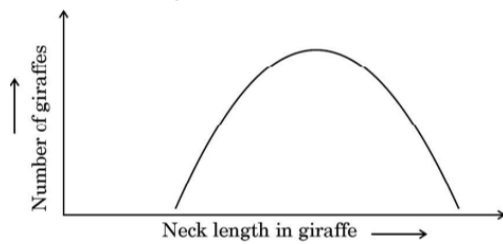
Section A

1. Mycorrhiza is an example of: [1]
 - a) Saprophytism
 - b) Parasitism
 - c) Thyroxine
 - d) Symbiosis
2. The diagram represents miller's experiment. Choose the correct combination of labelling. [1]



- a) A-electrodes, B- $\text{NH}_3 + \text{H}_2\text{O}$, C-hot water, D-tap, E-U trap
 - b) A-electrodes, B- $\text{NH}_4 + \text{H}_2 + \text{CO}_2 + \text{CH}_3$, C-hot water, D-vacuum, E-U trap
 - c) A-electrodes, B- $\text{NH}_3 + \text{H}_2 + \text{H}_2\text{O} + \text{CH}_4$, C-steam, D-vacuum, E-U trap
 - d) A-electrodes, B- $\text{NH}_3 + \text{H}_2 + \text{H}_2\text{O} + \text{CH}_4$, C-cold water, D-vacuum, E-U trap
3. Energy transfer from one trophic level to another is: [1]
 - a) 50%
 - b) 100%
 - c) 5%
 - d) 10%

4. Select the option that gives the correct description of the process of Natural Selection with respect to the length of the neck of giraffe. [1]



- a) Stabilising selection as giraffes with medium neck lengths are selected. [1]
 b) Directional selection as giraffes with longer neck lengths are selected.
 c) Disruptive selection as giraffes with smaller and longer neck lengths are selected.
 d) Stabilising selection as giraffes with longer neck lengths are selected further.

5. **Assertion (A):** Large holes in **Swiss cheese** are due to the production of a large amount of carbon dioxide by specific microbe. [1]

Reason (R): The specificity of characteristic texture, flavour and taste of **Swiss cheese** is due to the use of bacterium *Propionibacterium shermanii*.

- a) Both Assertion and Reason are true, and Reason is the correct explanation of the Assertion. [1]
 b) Both Assertion and Reason are true, but Reason is **not** the correct explanation of the Assertion.
 c) Assertion is true but Reason is false.
 d) Both Assertion and Reason are false.

6. **Assertion:** Gene flow increases genetic variations. [1]

Reason: The random introduction of new alleles into the recipient population and their removal from the donor population affects allele frequency.

- a) Assertion and reason both are correct statements and reason is correct explanation for assertion. [1]
 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.

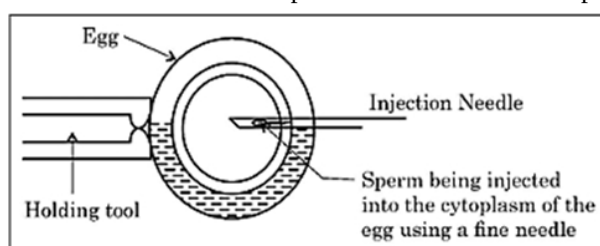
7. Hot spots are places where: [1]

- a) High degree of endemism [1]
 b) All of these
 c) High degree of species richness
 d) High degree of habitat loss

8. Which of the following is a hormone releasing Intra-Uterine Device (IUD)? [1]

- a) Multiload- 375 [1]
 b) Cervical cap
 c) Vault
 d) LNG-20

9. Observe the schematic representation of assisted reproductive technology given below: [1]



Identify the most appropriate technique depicted in the above diagram.

- a) ZIFT
- b) ICSI
- c) IUT
- d) IUI

10. Among the following stem cells, which are found in umbilical cord: [1]

- a) Cord blood stem cells
- b) All of these
- c) Embryonic stem cells
- d) Adult stem cells

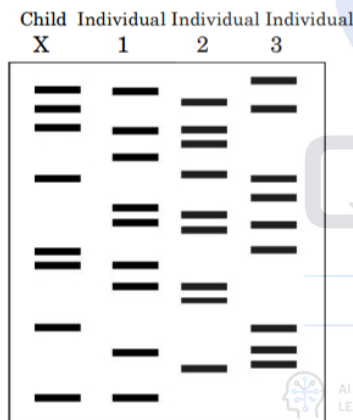
11. α - interferon acts as [1]

- a) Biological response modifier
- b) Sedative
- c) Allergen
- d) Carcinogen

12. In a test-cross involving F_1 dihybrid flies, more parental-type offspring were produced than the recombinant-type offspring. This indicates: [1]

- a) The two genes are linked and present on the same chromosome
- b) Both of the characters are controlled by more than one gene.
- c) Chromosomes failed to separate during meiosis
- d) The two genes are located on two different chromosomes

13. Study the DNA profiles obtained as a result of DNA fingerprinting of a child X and three individuals 1, 2 and 3. Which one of the following options shows the possible parents of the child X? [1]



- a) 1 and 3
- b) Only individual 3
- c) 2 and 3
- d) 1 and 2

14. In a particular climatic condition, decomposition rate is slower if: [1]

- a) Detritus is rich in humus.
- b) Detritus is rich in sugars.
- c) Detritus is rich in nitrogen.
- d) Detritus is rich in lignin and chitin.

15. **Assertion (A):** Some aquatic ecosystems have inverted biomass pyramids. [1]

Reason (R): More energy is required by the organisms occupying higher trophic levels.

- a) Both A and R are true and R is the correct explanation of A.
- b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.

16. **Assertion (A):** Generally, a woman does not conceive during the lactation period. [1]

Reason (R): The hormone 'prolactin initiates and maintains lactation in a postpartum woman

a) Both A and R are true and R is the correct explanation of A.

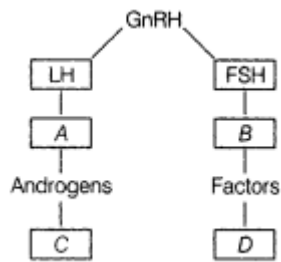
c) A is true but R is false.

b) Both A and R are true but R is not the correct explanation of A.

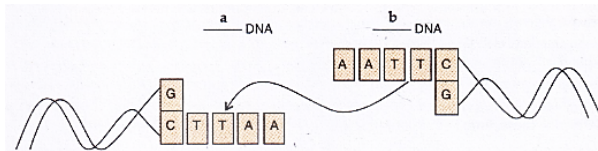
d) A is false but R is true.

Section B

17. Identify A, B, C and D with reference to gametogenesis in humans, in the flow chart given below. [2]



18. Study the linking of DNA fragments shown above. [2]



Study the linking of DNA fragments shown above.

i. Name 'a' DNA and 'b' DNA

ii. Name the enzyme that can link these two DNA fragments.

19. How has the bacterium *Bacillus thuringiensis* helped us in controlling caterpillars of insect pests? [2]

OR

What is LAB? What is its role in human stomach?

20. In the diagram given below, show the path of a pollen tube from the pollen on the stigma into the embryo sac. [2]
Name the components of egg apparatus.



QuestIQ
— ACADEMY —
— THINK BEYOND LIMITS. —



Powered by QualCrypt

21. Sangeeta has developed a transgenic crop. She wants to grow this crop directly into the field. Will you allow her to do so? What will you suggest her? [2]

Section C

22. Observe the diagram of Genetic code and answer the following questions: [3]

		Second letter					
		U	C	A	G		
First letter	U	UUU } Phe UUC } UUA } Leu UUG }	UCU } Ser UCC } UCA } UCG }	UAU } Tyr UAC } UAA } Stop UAG } Stop	UGU } Cys UGC } UGA } Stop UGG } Trp	U C A G	Third letter
	C	CUU } Leu CUC } CUA } CUG }	CCU } Pro CCC } CCA } CCG }	CAU } His CAC } CAA } Gln CAG }	CGU } Arg CGC } CGA } CGG }	U C A G	
	A	AUU } Ile AUC } AUA } AUG } Met	ACU } Thr ACC } ACA } ACG }	AAU } Asn AAC } AAA } Lys AAG }	AGU } Ser AGC } AGA } Arg AGG }	U C A G	
	G	GUU } Val GUC } GUA } GUG }	GCU } Ala GCC } GCA } GCG }	GAU } Asp GAC } GAA } Glu GAG }	GGU } Gly GGC } GGA } GGG }	U C A G	

i. How many codons codes for amino acids and how many do not?

ii. Explain the following giving one example of each.

- Unambiguous and specific codon
- Degeneration codon
- Universal codon
- Initiator codon

23. i. Why is the collection of white-winged moths and dark-winged moths made in England between 1850 - 1920 considered a good example of natural selection? [3]

ii. **Evolution is based on chance events in nature and chance mutations in organisms.** Justify the statement.

24. A species-area curve is drawn by plotting the number of species against the area. How is it that when a very large area is considered the slope is steeper than that for smaller areas? [3]

OR

What does the term genetic diversity refer to? What is the significance of large genetic diversity in a population?

25. a. Write the complete name of the diagnostic test for AIDS. Explain the principle it works on. [3]
b. Name the type of genetic material present in AIDS-causing pathogen.

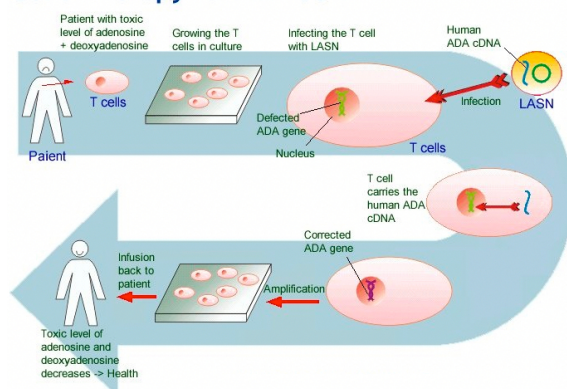
26. Define the following terms and give one example for each: [3]

- Commensalism
- Parasitism
- Camouflage
- Mutualism
- Interspecific competition

27. Define and design a test cross. [3]

28. This image highlights the process of Gene Therapy of ADA-SCID. [3]

Gene Therapy for ADA-SCID



i. Mention the cause of ADA deficiency in humans.

ii. How has genetic engineering helped patients suffering from it?

Section D

29. Read the following passage and answer the questions that follow: [4]

"Mosquitoes are drastically affecting the human health in almost all the developing tropical countries. Different species of mosquitoes cause very fatal diseases so much so that many humans lose their life and if they survive, are unable to put in productive hours to sustain their life. With the result the health index of the country goes down."

- Name the form in which Plasmodium gains entry into (i) human body (ii) the female Anopheles body. (1)
- Why do the symptoms of malaria not appear in a person immediately after being bitten by an infected female Anopheles? Give one reason. Explain when and how do the symptoms of the disease would appear. (2)

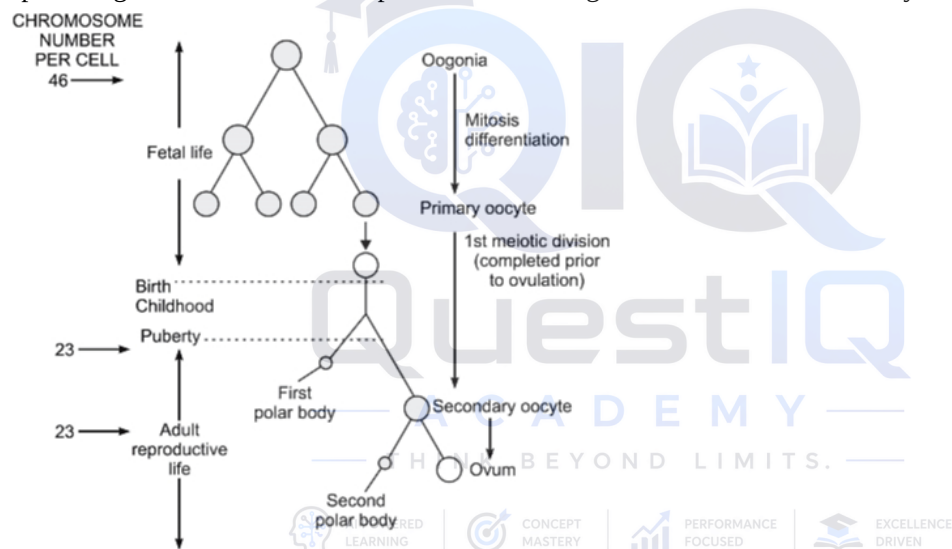
OR

Explain the events which occur within a female Anopheles mosquito after it has sucked blood from a malaria patient. (2)

- Name a species of mosquito other than female Anopheles and the disease, for which it carries the pathogen. (1)

30. Read the following text carefully and answer the questions that follow: [4]

The process of formation of a mature female gamete is called oogenesis which is markedly different from spermatogenesis. A schematic representation of Oogenesis is shown below study the flow chart carefully.



- How is a primary oocyte different from a secondary oocyte? (1)
- Mention the changes taking place during the transition of a secondary follicle to Graafian follicle in the oogonia. (1)
- How many primary follicles are left in each ovary in a human female at puberty? (2)

OR

What happens to a Graafian follicle after ovulation? (2)

Section E

31. Define an operon. Giving an example, explain an Inducible operon. [5]

OR

Explain the process of transcription in prokaryotes.

- Why must a cell be made 'competent' in biotechnology experiments? How does calcium ion help in doing so? [5]
- State the role of 'biolistic gun' in biotechnology experiments.

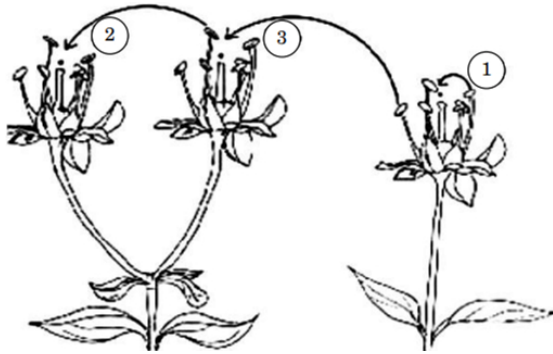
OR

For the selection of recombinants, insertional inactivation of the antibiotic marker has been superseded by insertional inactivation of a marker gene coding for a chromogenic substrate. Give reasons.

33. Draw a labelled diagram of the sectional view of a mature pollen grain of angiosperms. Explain the function of any two of its parts. [5]

OR

Study the diagram given below showing the modes of pollination. Answer the questions that follow.



- The given diagram shows three methods of pollen transfer in plants. What are the technical terms used for pollen transfer methods 1, 2 and 3?
- How do the following plants achieve pollination successfully?
 - Water lily
 - Vallisneria
- Flowering plants have developed many devices to avoid inbreeding depression. Explain one hereditary and one physiological device which helps plants to achieve this target.

QuestIQ
— A C A D E M Y —
— THINK BEYOND LIMITS. —



AI POWERED
LEARNING



CONCEPT
MASTERY



PERFORMANCE
FOCUSED



EXCELLENCE
DRIVEN

Powered by QualCrypt