

Class XII | Session 2026-27
Subject - Biology
Sample Question Paper - Set 2

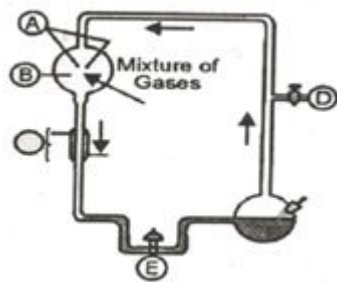
General Instructions:

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.

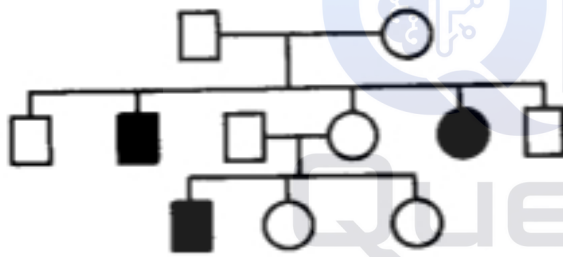
Section A

1. The loss of energy as one proceeds from one trophic level to the next trophic level is approximately: [1]
a) 40% b) 60%
c) 90% d) 30%
2. Which one is not a natural method of birth control. [1]
a) Rhythm period b) Tubectomy
c) Coitus interrupts d) To abstain
3. Androgenic haploids are used for: [1]
a) Knowing effect of all genes. b) Preparation of homozygous diploids.
c) Induction of mutations. d) Raising stock for micropropagation.
4. When natality is balanced by mortality. There will be [1]
a) Over population b) Zero population growth.
c) Increase in population growth. d) Decrease in population growth.
5. Most industrialized nations are rich financially but poor in: [1]
a) Traditional knowledge and land requirement b) Health and manpower
c) Biodiversity and traditional knowledge d) Population
6. Bacteria which converts milk into curd is: [1]
a) Closteridium b) Streptococcus
c) Lactobacillus d) Spirillum

7. When two genes are situated very close to one another on a chromosome: [1]
- a) Hardly any cross-overs are produced b) No crossing over can take place
- c) Only double cross-over can occur between them d) The percentage of crossing over between them is very high
8. What was the resultant found in the place marked E? [1]

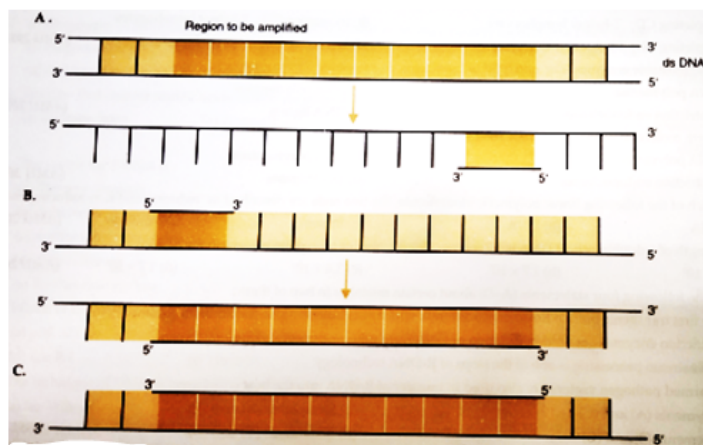


- a) Organic esters only b) Some fatty acids and organic acids
- c) Some amino acids as glycine and alanine d) Glucose, fatty acids and lipids
9. Bacteria and fungi in a forest ecosystem are generally: [1]
- a) Decomposers b) Producers
- c) Primary consumers d) Secondary consumers
10. Study the pedigree chart given below: [1]



What does it show?

- a) Inheritance of a recessive sex-linked disease like haemophilia b) The pedigree chart is wrong as this is not possible
- c) Inheritance of a sex-linked inborn error of metabolism like phenylketonuria d) Inheritance of a condition like phenylketonuria as an autosomal recessive trait
11. Which one of the following is used as biological insecticide? [1]
- a) Caterpillar b) Mazra Poka
- c) Tiger beetle d) Silkworm
12. The figure below shows three steps (A, B, C) of Polymerase Chain Reaction (PCR). Select the option giving correct identification together with what it represents? [1]



a) A - denaturation at a temperature of about 50°C.

b) B - denaturation at a temperature of about 98°C separating the two DNA strands.

c) A - annealing with two sets of primers.

d) C - extension in the presence of heat stable DNA polymerase.

13. **Assertion (A):** Coitus interruptus has a high failure rate for a method of contraception.

[1]

Reason (R): The pre-ejaculate fluid secreted by bulbourethral glands is known to have sperms.

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.

14. **Assertion (A):** Lichen is important for chemical industries.

[1]

Reason (R): Litmus and Orcein are formed from lichens.

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.

15. **Assertion (A):** Kangaroo rats do not drink water.

[1]

Reason (R): Water is not needed by them.

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):** After appearance of oxygen in the atmosphere, methane and ammonia began to disappear.

[1]

Reason (R): Oxygen is involved in forming ozone layer.

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.

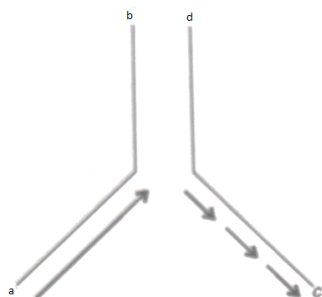
Section B

17. What are transgenic plants? Give some example.

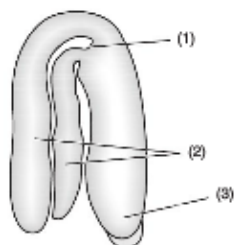
[2]

18. Mention the polarity of the DNA strands a - b and c - d shown in the replicating fork given below:

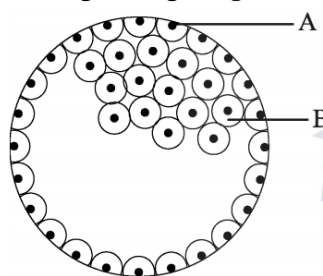
[2]



19. In the given figure of a typical dicot embryo, label the parts (1), (2) and (3). State the function of each of the labeled part. [2]



20. In the given figure, give the name and functions of parts labelled A and B. [2]



21. Give examples to prove that microbes release gases during metabolism. [2]

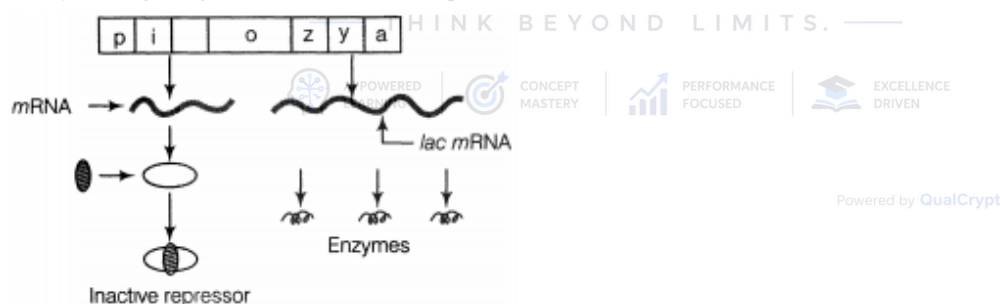
OR

a. Differentiate between humoral and cell mediated immune response.

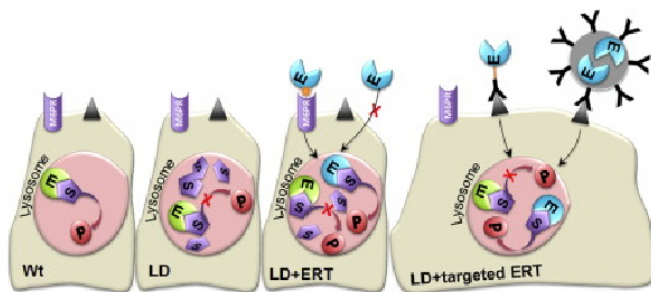
b. Why is a patient who has undergone organ transplant put on immunosuppressants? Explain.

Section C

22. Study the figure given and answer the questions. [3]



- How does the repressor molecule get inactivated?
 - When does the transcription of lac mRNA stop?
 - Name the enzyme transcribed by the gene z.
23. You must have read in the news paper that some children suffering from Thalesemia became HIV positive due to negligence of a hospital. What negligence has been made on part of hospital authorities in your opinion? [3]
24. A population of Paramoecium caudatum was grown in a culture medium. After 5 days the culture medium became overcrowded with Paramoecium and had depleted nutrients. What will happen to the population and what type of growth curve will the population attain? Draw the growth curve. [3]
25. The image below elaborates enzyme-replacement therapy. [3]



- i. Explain enzyme-replacement therapy to treat adenosine deaminase deficiency.
- ii. Mention two disadvantages of this procedure.

26. Biodiversity must be conserved as it plays an important role in many ecosystem services that nature provides. [3]
Explain any two services of the ecosystem.

OR

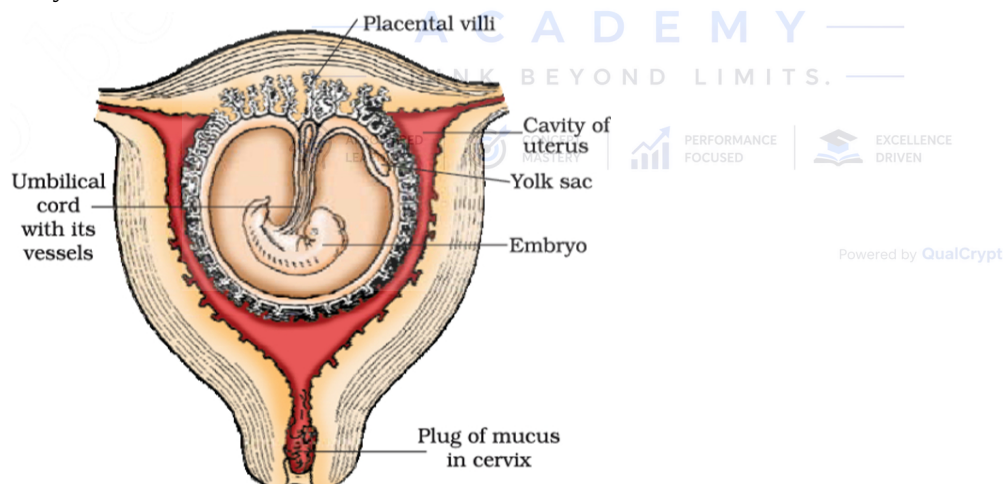
Bio-diversification of life started to occur almost 3 billion years ago. Since then new species have been evolving and then disappearing en masse from earth.

- a. How many episodes of mass extinctions of species have already taken place and which one is in progress in the current era?
 - b. How is current episode in progress different from the previous episodes and why? Explain.
27. How does paleontological evidence support evolution of organisms on Earth? [3]
28. Represent schematically the life cycle of a malarial parasite. [3]

Section D

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

After implantation, finger-like projections appear on the trophoblast called chorionic villi which are surrounded by the uterine tissue and maternal blood. The chorionic villi and uterine tissue become interdigitated with each other and jointly form a structural and functional unit between the developing embryo (foetus) and the maternal body.



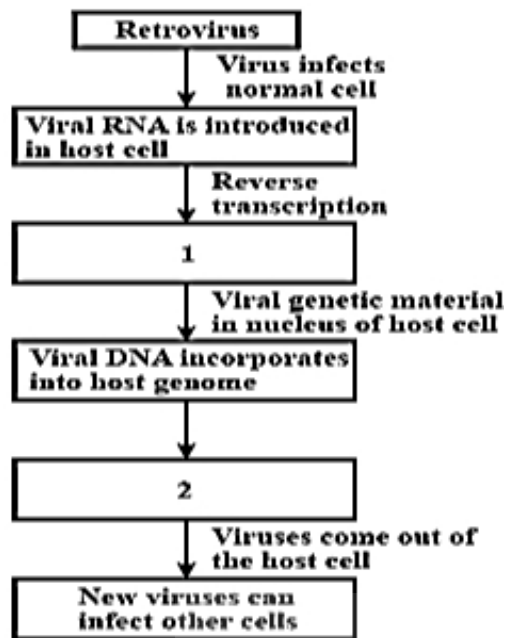
- i. Name the hormone crucial in parturition. Does the parturition signal originate from the mother or the fetus? (1)
- ii. When and where do chorionic villi appear in humans? (1)
- iii. Woman has conceived and implantation has occurred. Discuss the impact of progesterone and estrogen. (2)

OR

Fetal ejection reflex leads to parturition. Justify (2)

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

The diagram shows the replication of the retrovirus in the host.



- Fill in the missing data in boxes labelled 1 & 2. (1)
- Why is it named as retrovirus? (1)
- While the virus is being replicated and released, does the infected cell survive and why the virus infected cells prevent spreading of virus to healthy cells? (2)

OR

What is the effect of HIV infection on immune system? (2)

Section E

31. What are the advantages and disadvantages of cross-pollination? [5]

OR

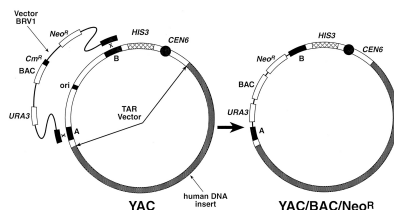
A flower of the brinjal plant following the process of sexual reproduction produces 360 viable seeds.



Answer the following questions giving reasons.

- How many ovules are minimally involved?
- How many megaspore mother cells are involved?
- What is the minimum number of pollen grains that must land on stigma for pollination? **OR**
- How many male gametes are involved in the above case?

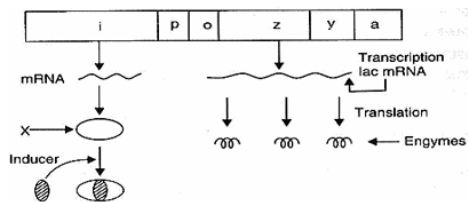
32. Observe the diagram for YAC and BAC vector and answer the questions that follow: [5]



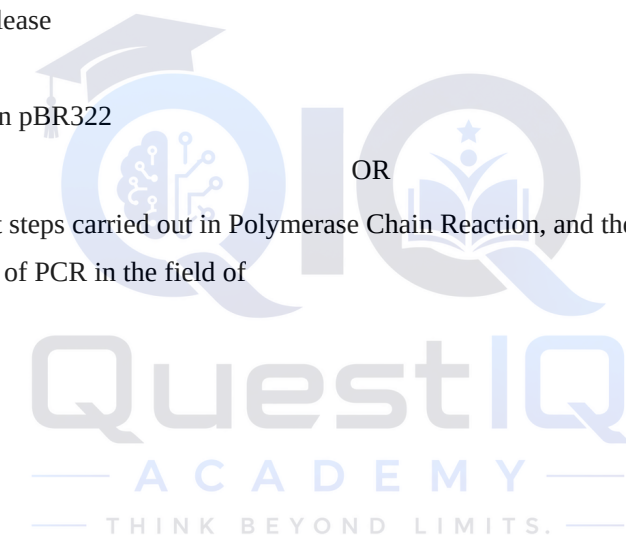
- i. What do 'Y' and 'B' stand for in 'YAC' and 'BAC' used in the Human Genome Project (HGP)? Mention their role in the project.
- ii. Write the percentage of the total human genome that codes for proteins and the percentage of discovered genes whose functions are known as observed during HGP.
- iii. Expand SNPs identified by scientists in HGP.

OR

Study the figure given below and answer the following questions:



- i. Name the molecule 'X' synthesized by 'i' gene. How does this molecule gets inactivated?
 - ii. Which one of the structural genes codes for β -galactosidase?
 - iii. When will the transcription of this gene stop?
33. Explain the role(s) of the following in biotechnology [5]
- i. Restriction endonuclease
 - ii. Gel-electrophoresis
 - iii. Selectable markers in pBR322
- OR
- a. Explain the different steps carried out in Polymerase Chain Reaction, and the specific roles of the enzymes used.
 - b. Mention application of PCR in the field of
 - i. Biotechnology
 - ii. Diagnostics



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