

# BIOLOGY

STD-12<sup>TH</sup>

TOTAL MARKS-70

## General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper has five sections and 33 questions. All questions are compulsory.
- (iii) 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.
- (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

Q.N  
o. Question Marks

1. During menstrual cycle level of LH and oestrogen are highest around
- a. 14<sup>th</sup> day
  - b. 21<sup>st</sup> day
  - c. 7<sup>th</sup> day
  - d. 28<sup>th</sup> day

1

2. Select the correct match:

1

I	II
A. Locational amenorrhea	1. Directly injecting a sperm into the ovum.
B. ICSI	2. Suppressing ovulation and implantation.
C. Tubectomy	3. Suppression of gonadotropins.
D. Oral contraceptive	4. Blocking the transport of gametes.
	5. Implant under the skin.

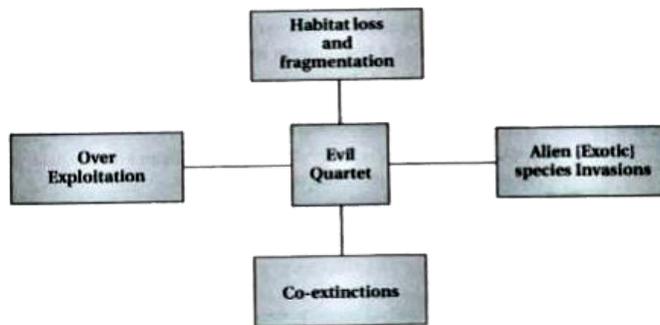
- (a) A-3, B-1, C-4, D-2
- (b) A-2, B-5, C-4, D-3
- (c) A-5, B-1, C-2, D-4
- (d) A-3, B-2, C-1, D-4

- 3 In Sickle cell anemia, at which position, the amino acid gets changed: - 1
- Fourth position
  - Fifth position
  - Sixth position
  - Seventh position
- 4  $(p+q)^2 = p^2 + 2pq + q^2 = 1$  represents an equation used in 1
- population genetics
  - Mendelian genetics
  - biometrics
  - molecular genetics.
5. According to Oparin, which one of the following was not present in the primitive atmosphere of the earth ? 1
- Methane
  - Oxygen
  - Hydrogen
  - Water vapour
6. Cancer causing genes are called. 1
- Structural genes
  - Expresser genes
  - Oncogenes
  - Regulatory gene
7. AIDS is caused by HIV. Among the following which one is not a mode of transmission of HIV? 1
- Transfusion of contaminated blood
  - Sharing the infected needles
  - Sharing hands with infected persons
  - Sexual contact with infected person
8. Methanogens, growing anaerobically on cellulosic material, produce 1
- methane gas
  - methane and carbon dioxide
  - methane and hydrogen
  - methane, carbon dioxide, hydrogen.
9. For the production of ethanol, the most common substrate used in distilleries is 1
- Soya meal
  - Molasses
  - Ground gram
  - corn meal
10. Carbon dioxide is not released in which of the following processes? 1
- Lactate fermentation
  - Alcoholic fermentation
  - Aerobic respiration in animals
  - Aerobic respiration in plants
11. The first ever human hormone produced by recombinant DNA technology is 1
- Progesterone
  - Insulin
  - Estrogen
  - Progesterone

- 12 What is an ecological niche? 1
- a. the ocean
  - b. an ecologically adapted zone
  - c. the physical position and functional role of a species within the community.
  - d. formed of all plants and animals living in a lake

**Question No. 13 to 16 consist of two** statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

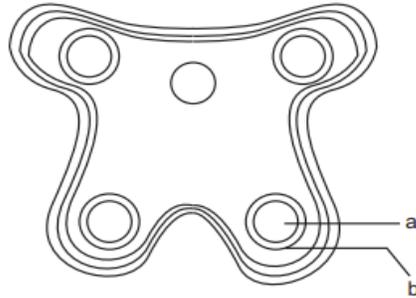
- A. Both A and R are true and R is the correct explanation of A.
  - B. Both A and R are true and R is not the correct explanation of A.
  - C. A is true but R is false.
  - D. A is False but R is true.
13. Assertion: Fitness is the end result of the ability to adapt and get selected by nature. 1  
Reason: Adaptive ability is inherited and it has a genetic basis.
14. Assertion: animals with same structure developed along different directions due to adaptations to different needs. 1  
Reason: This is Convergent evolution and these structures are homologous.
15. Assertion: A network of food chains existing together in an ecosystem is known as food web. 1  
Reason: An animal like kite cannot be a part of food web.
16. Given below is the diagrammatic representation of Evil Quartet. Study the diagram and write the appropriate assertion reason 1



Assertion: It is a concept that describes the reason that causes extinction of species.  
Reason: The ‘Evil Quartet’ is a sobriquet for biodiversity loss.

### SECTION - B

17. In the TS of a mature anther given below, identify 'a' and 'b' and mention their functions. 2



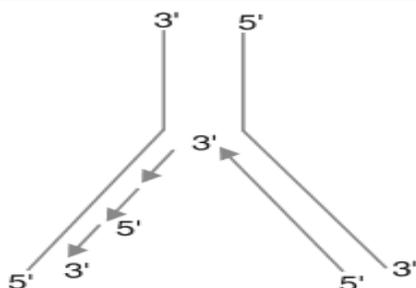
18. Is haemophilia in humans a sex linked or autosomal disorder? Work out a cross in support of your answer. 2
19. A 4 years old girl visited a hospital with a genetic disorder. The girl was provided enzyme-replacement therapy and was advised to revisit periodically for further treatment. 2
- a. Name the ailments that girl was suffering from?
  - b. Why did the treatment provided to that girl required repeated visits?
20. 2
- a. What is hydrarch succession?
  - b. Compare the pioneer species and climax communities of hydrarch and xerarch succession respectively.
21. Depict with the help of simple sketches the representation of global biodiversity of major taxa of plants, invertebrates, and vertebrates. 2

OR

Elaborate how invasion by an alien species reduces the diversity of an area.

### SECTION - C

22. Pollen banks are playing a very important role in promoting plant breeding programme the world over. How are pollens preserved in the pollen banks? Explain. How are such banks benefitting our farmer? Write any two ways. 3
23. Mendal published his work on inheritance of character in 1865 but it remained unrecognized till 1900. Give three reasons for the delay in acceptance. 3
24. Why do you see two different types of replicating strands in the given DNA replication fork? Explain. Name these strands. 3



25 Describe the three different ways by which Natural selection can affect the frequency of a heritable traits in population. 3

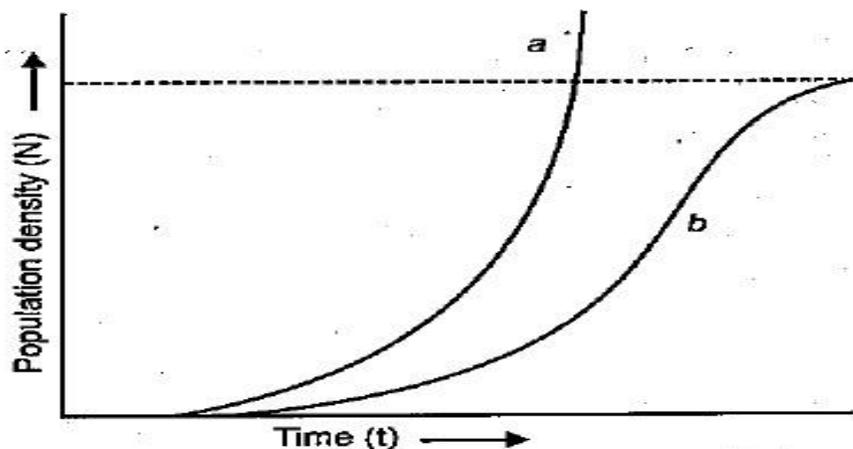
26 Choose any three microbes, from the following which are suited for organic farming which is in great demand these days for various reasons. Mention one application of each one chosen. Mycorrhiza; Monascus; Anabaena; Rhizobium; Methanobacterium; Trichoderma. 3

OR

How is the Bt cotton plant created as a GM plant? How is it protected against bollworm infestation?

27 Explain the structure of Insulin. How insulin is synthesized in humans (or mammals)? 3

28 Study the graph given below and answer the questions that follow : 3



- I. Write the status of food and space in the curves (a) and (b).
- II. In the absence of predators, which one of the two curves would appropriately depict the prey population?
- III. Time has been shown on X-axis and there is a parallel dotted line above it. Give the significance of this dotted line.

#### SECTION - D

Q.no 29 and 30 are case based questions. Each question has subparts with internal choice in one subpart.

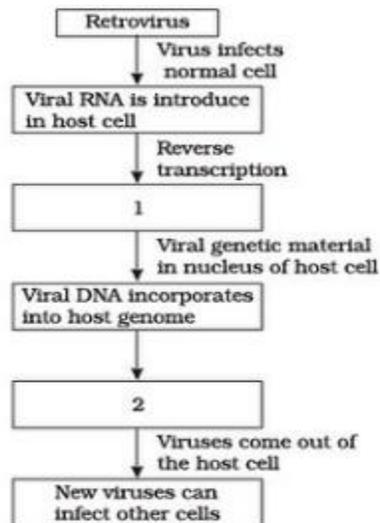
29 Study the flowchart given below and answer the questions that follows 4

- I. S-strain → into mice → mice die
  - II. R-strain → into mice → mice live
  - III. Heat-killed S-strain + Live R-strain → into mice → A
  - IV. Heat-killed S-strain + DNase + Live R-strain → into mice → B
- a. Name the organism and differentiate between its two strains S and R, respectively.
  - b. Write the result A and B obtained in step III and IV, respectively.
  - c. Name the scientist who performed this experiment. Write the specific conclusion drawn from the step IV.

OR

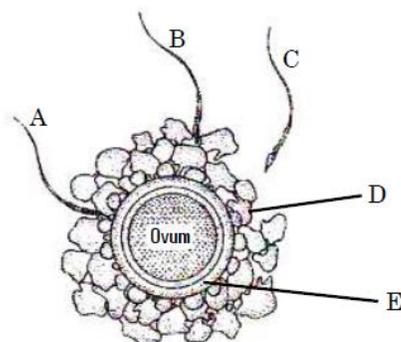
- c. Why this experiment is called 'Transforming principle'?

30. The diagram shows replication of the retrovirus in the host. Note and answer the following questions. 4
- Fill in the missing data in boxes labelled 1 & 2.
  - Why is it named as retrovirus?
  - While the virus is being replicated and released, does the infected cell survive?



### SECTION - E

31. What is GMO? List any five possible advantages of a GMO to a farmer. 5
- OR**
- Draw a labelled sketch of sparged-stirred-tank bioreactor. Write its application.
32. Given below is the diagram of a human ovum surrounded by a few sperms. Study the diagram and answer the following questions.. 5



- Which one of the sperms would reach the ovum earlier?
- Identify 'D' and 'E'. Mention the role of 'E'.
- Mention what helps the entry of sperm into the ovum and write the changes occurring in the ovum during the process.
- Name the specific region in the female reproductive system where the event represented in the diagram takes place.

**OR**

- a. i) Explain the following phases in the menstrual cycle of a human female.
- (a) Menstrual phase
  - (b) Follicular phase
  - (c) Luteal phase
- (ii) A proper understanding of menstrual cycle can help immensely in family planning. Do you agree with the statement? Provide reasons for your answer.
33. A large number of married couples in the world are childless. It is shocking to know that in India, the female partner is often blamed for the couple being childless. 5
- (i) Why in your opinion the female partner is often blamed for such situations in India? Mention any two values that you as a biology student can promote to check this social evil.
- (ii) State any two reasons responsible for the cause of infertility.
- (iii) Suggest a technique that can help the couple to have a child where the problem is with the male partner.

**OR**

Name and explain the surgical method advised to human males and females as a mean of birth control. Mention its one advantage and one disadvantage.