

**Sample Question Paper  
Class XII (2017-18)  
Biology (044)**

Time allowed: 3hrs.

Maximum Marks: 70

**General Instructions:**

1. There are a total of 26 questions and five sections in the question paper. All questions are compulsory.
2. Section A contains question number 1 to 5, Very Short Answer type questions of one mark each.
3. Section B contains question number 6 to 10, Short Answer type I questions of two marks each.
4. Section C contains question number 11 to 22, Short Answer type II questions of three marks each.
5. Section D contains question number 23, Value Based Question of four marks.
6. Section E contains question number 24 to 26, Long Answer type questions of five marks each.
7. There is no overall choice in the question paper, however, an internal choice is provided in one question of two marks, one question of three marks and all three questions of five marks. An examinee is to attempt any one of the questions out of the two given in the question paper with the same question number.

**Section – A**

1. A tissue, of a tobacco plant, infected with TMV was used to obtain a new plant. Identify the technique used and reason out the possibility of obtaining a new healthy plant. 1
2. State a method of cellular defense which works in all eukaryotic organisms 1
3. In case of an infertile couple, the male partner can inseminate normally but the mobility of sperms is below 40 percent. Which kind of ART is suitable in this situation to form an embryo in the laboratory conditions, without involving a donor? 1
4. Write the two components of the first artificial recombinant DNA molecule constructed by Cohen and Boyer. 1
5. A cross was carried out between two pea plants showing the contrasting traits of height of the plant. The result of the cross showed 50% of parental characters. Name the type of cross. 1

**Section B**

6. The alarming population growth is leading to scarcity of basic requirements. Suggest with reasons, any two population control measures other than contraception to address the situation. 2

7. During a cytological study conducted on the chromosomes of the insects, it was observed that only 50% of the sperms had a specific structure after spermatogenesis. Name the structure and write its significance in sex determination of insects. 2
8. To reduce the percentage of population suffering from hunger and malnutrition, microbes are grown on a large scale to act as food supplements. Mention any two microbes used as food supplement and suggest their role. 2

**OR**

Success rate of artificial insemination in cattle is fairly low. Identify any other technique to improve the successful production of hybrids. State two advantages of this technique.

9. (a) A patient who had an organ transplant was given cyclosporin– A. Mention the microbial source and state the reason for administration of this bioactive molecule. 2  
(b) Bottled fruit juices bought from the market are clearer as compared to those made at home. Give reason.
10. Evaluate the effect of loss of biodiversity in a region. Mention any four such effects. 2

Section C

11. Draw the diagram of microsporangium of an Angiosperm and label any four parts. State the function of its innermost wall layer. 3
12. Give reason : - 3  
(a) A liverwort plant is unable to complete its life cycle in a dry environment.  
(b) Number of male gametes produced is much more than the female gametes produced.  
(c) Organisms exhibiting external fertilization show great synchrony between the sexes and release a large number of gametes into surrounding medium.
13. (a) Name the different gases contained in the flask used as an experimental setup by S.L. Miller. 3  
(b) On the basis of composition of gases in this experiment, what was the condition in the flask?  
(c) Write the conclusion drawn from this experiment.
14. When a snapdragon plant bearing pink colour flower was selfed, it was found that, 69 plants were having red coloured flowers. What would be the number of plants bearing pink flower and white flower. Show with the help of Punnett square. Identify the principle of inheritance involved in this experiment. 3
15. Refer to the figure given below and answer the questions that follow:



- (a) Explain the process by which Tasmanian wolf evolved.  
 (b) Name the process that has resulted in evolution of wolf and Tasmanian wolf. 1+1+1  
 (c) Compare and contrast the two animals shown?
16. Your classmate complains of headache and cough. On the basis of certain symptoms, the doctor confirms that he is suffering from Pneumonia and not common cold. List these symptoms. Mention any two precautions to be followed to prevent the spread of this disease. 3
17. Cow dung and water is mixed and this slurry is fed into the biogas plant for digestion by microbes. The person performing the process shares that there is no need to provide any inoculum for it. Give reason. What is the role of microbes at the source? Under which condition will they be most active and effective? 3
18. A person is born with a weakened immune system due to deficiency of an enzyme which is a hereditary disease. Suggest a technique to completely cure this disease, identify the deficient enzyme and explain the technique used, for cure. 3
19. A doctor prescribed morphine as a sedative and pain killer to your cousin who had undergone a surgery. Even after recovery, he indiscriminately took the medicines and later craved for the same. What do you conclude about his condition? What measures will you suggest to him to overcome this problem? Briefly explain any two. 3
20. Given below is the diagram of agarose gel kept under UV light: 3



- (a) Mention the positive and negative terminals.  
 (b) What is the charge carried by DNA molecule and how does it help in its separation?  
 (c) How are the separated DNA fragments finally isolated?

1+1+1

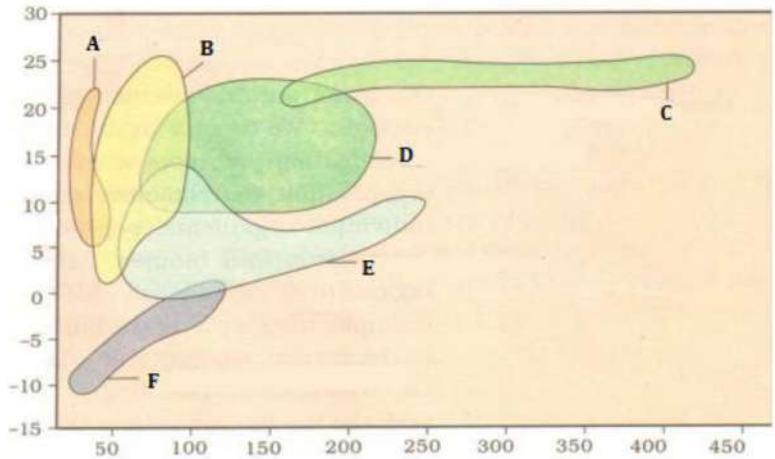
OR

*CryIAb* is introduced in a plant to prevent infestation by corn borer.

- (a) What is the resultant plant referred as?  
 (b) Summarize the action of the gene introduced

$\frac{1}{2} + 2\frac{1}{2}$

21. (a) In pBR322, foreign DNA has to be introduced in  $tet^R$  region. From the restriction enzymes given below, which one should be used and why: PvuI, EcoRI, BamHI 2+1  
 (b) Give reasons, why the other two enzymes cannot be used.
22. The graph given below shows the distribution of biomes: 1+1+1



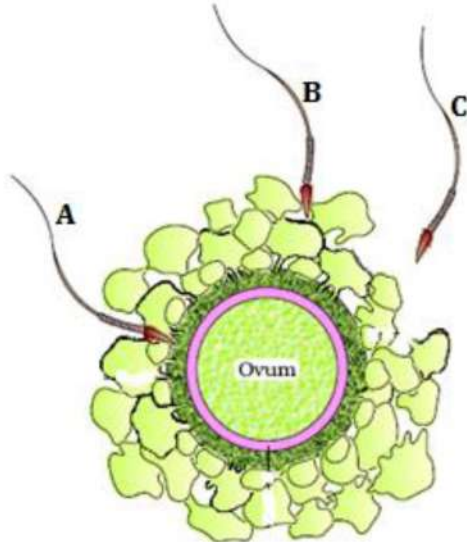
- (a) What do the 'X' and 'Y' axis represent?
- (b) Identify the 'grassland' and 'coniferous forest' biomes, from the above figure.
- (c) Why is 'F' located at the given position in the graph?

**Section D**

23. A son persuades his father to replace his old mobile phone with the latest model launched in the market. He also shares the latest features it has and explains how it can be of a help to him in the modern technological world. Father is reluctant in buying a new one and tries to explain about its environmental impact. How do you think, the biologist father would try to convince his son? Justify the arguments of father and son both, by mentioning positive aspects of the behavior displayed by both of them in the situation concerned (three each).

**Section E**

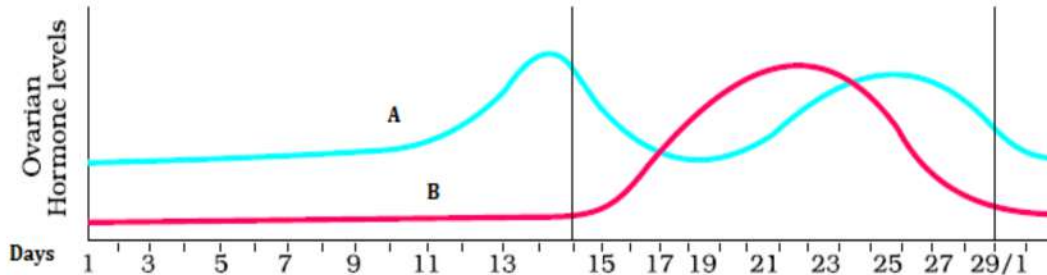
24. Given below is the diagram of a human ovum surrounded by a few sperms. Observe the diagram and answer the following questions:



- Compare the fate of sperms shown in the diagram.
- What is the role of zona pellucid in this process?
- Analyze the changes occurring in the ovum during the process.
- How is the entry of sperm into the ovum facilitated?
- Specify the region of female reproductive system where the event represented in the diagram takes place.

**OR**

The graph given below shows the variation in the levels of ovarian hormones during various phases of menstrual cycle:



- Identify 'A' and 'B'.
  - Specify the source of the hormone marked in the diagram.
  - Reason out why A peaks before B.
  - Compare the role of A and B.
  - Under which condition will the level of B continue to remain high on the 28<sup>th</sup> day?
25. Explain the process of protein synthesis from processed m-RNA. 5

**OR**

Which methodology is used while sequencing the total DNA from a cell? Explain it in detail.

26. Taking the example of a lake as a simple aquatic ecosystem, interpret how various functions of this ecosystem are carried out. Make a food chain that is functional in this ecosystem. 5

**5**

**OR**

- Colonization of a rocky terrain is a natural process. Mention the group of organisms which invade this area first. Give an example.
- Over the years, it has been observed that some of the lakes are disappearing due to urbanization. In absence of human interference, depict by making a flow chart, how do the successional seres progress from hydric to mesic condition.
- Identify the climax community of hydrarch and xerarch succession.

**1+3½+ ½**