

**Sample Question Paper 2**  
**Class XII (2016-17)**  
**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 certain tissue, of a plant, infected with TMV was used to obtain a new plant using tissue culture technique. 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. Judge, which kind of ART is suitable in this situation to form an embryo in the laboratory, without involving a donor? 1**
- 4. PCR requires very high temperature conditions where most of the enzymes get denatured. How was this problem resolved in a PCR? 1**
- 5. If two genes are located far apart from each other on a chromosome, what will be its effect on the frequency of recombination? 1**

## Section - B

6. The alarming population growth is leading to scarcity of basic requirements. Suggest with reason, any two population control measures other than contraception to address the situation. 2
7. Both Down's syndrome and Turner's syndrome are examples of chromosomal disorders. Cite the differences between the two, at the chromosomal level. 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

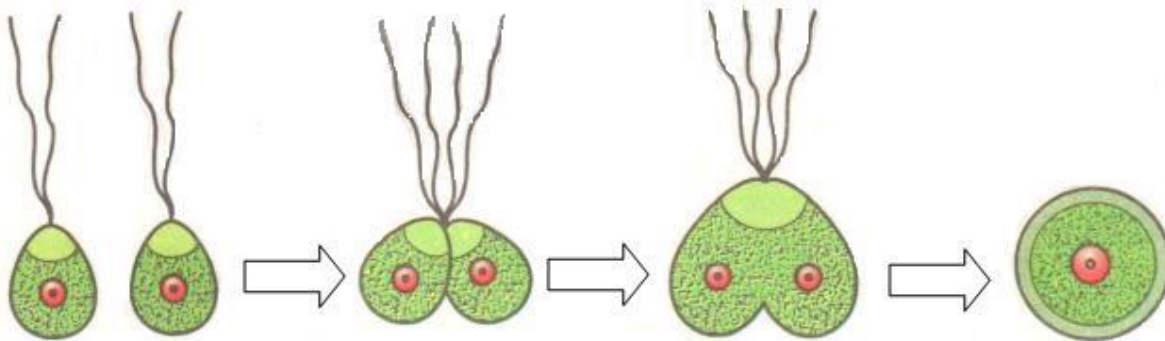
Success rate of artificial insemination in cattle is fairly low. Identify any other technique to improve the successful production of hybrids. State two advantages of this technique.

9. a) A patient who is suffering from myocardial infarction is given a clot buster as part of his treatment. Mention the clot buster administered and its microbial source. 1+1
- b) A person recuperating from illness is advised to have curd regularly. Why? 1+1
10. Assess the effects of loss of biodiversity in a region. Mention any four such effects. 2

## Section - C

11. Draw and label the enlarged view of microsporangium of an Angiosperm. State the function of its innermost wall layer. 3

12.



- a) State the type of gametes shown in the diagram above. 1
- b) Identify the process taking place and the resultant structure. 1
- c) Name an organism that reproduces in this manner. 1
13. Diagrammatically represent the experimental set up that proved Oparin - Haldane hypothesis. 3

14. True-breeding pea plants showing contrasting character for flower position were cross-bred.

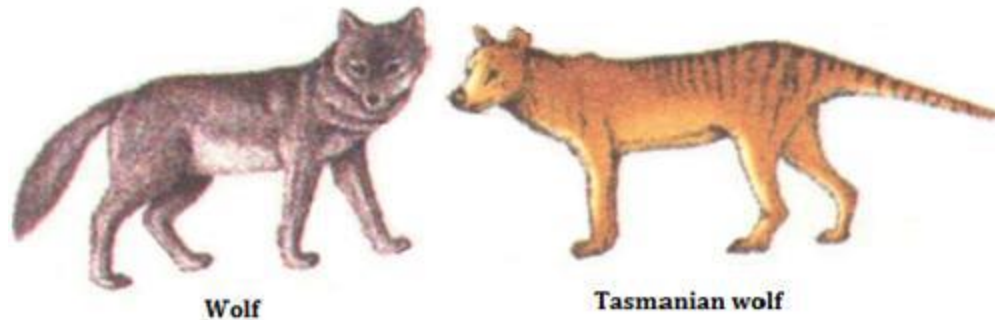
a) Mention the position of flowers in F<sub>1</sub> generation.

b) Work out the cross up to F<sub>2</sub> generation.

c) Compute the relative fraction of various genotypes in the F<sub>2</sub> generation?

1+1+1

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 another similar animal such as Tasmanian wolf.

c) Compare and contrast the two animals shown?

1+1+1

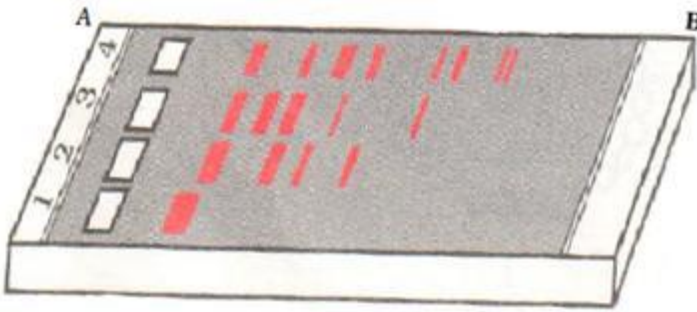
16. Your classmate complains of headache and cough. The doctor confirms that he is suffering from Pneumonia and not common cold, on the basis of certain symptoms. List these symptoms. Mention any two precautions to be followed to prevent the spread of this disease. 3

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 inoculum for it, why? 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 hereditary disease with a weakened immune system due to deficiency of an enzyme. Suggest a technique for complete cure for 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 surgery. Even after recovery, he craved for the prescribed medicine. What do you conclude about his condition, had he continued with the same medication? After appraising yourself, 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:



- a) Mark 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**

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

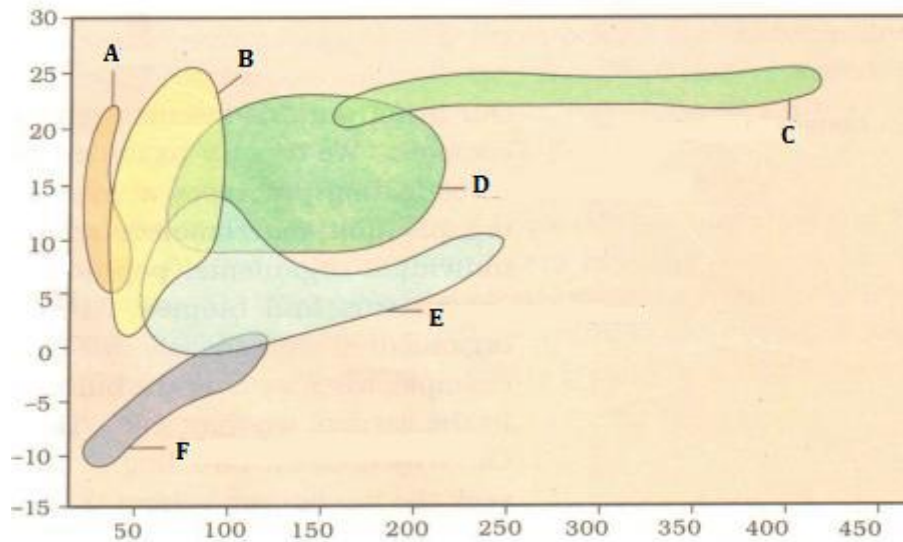
- a) What is the resultant plant referred as?  
 b) Summarize the action of the gene introduced. ½ +2½

21. a) In pBR322, foreign DNA has to be introduced in tet<sup>R</sup> region. From the restriction enzymes given below, which one should be used and why:

PvuI, EcoRI, BamHI

- b) Give reasons, why the other two enzymes cannot be used. 2+1

22. The graph given below shows the distribution of biomes:



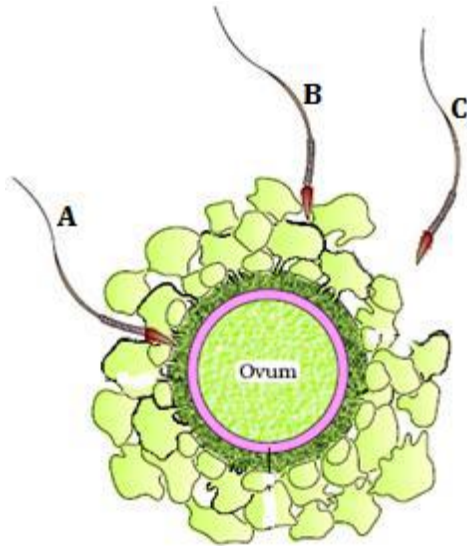
- a) What do the 'X' and 'Y' axes represent?  
 b) Identify the 'grassland' and 'coniferous forest' biomes, from the above figure.  
 c) Why is 'F' located at the given position in the graph? 1+1+1

### 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 has tried 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). 4

### Section - E

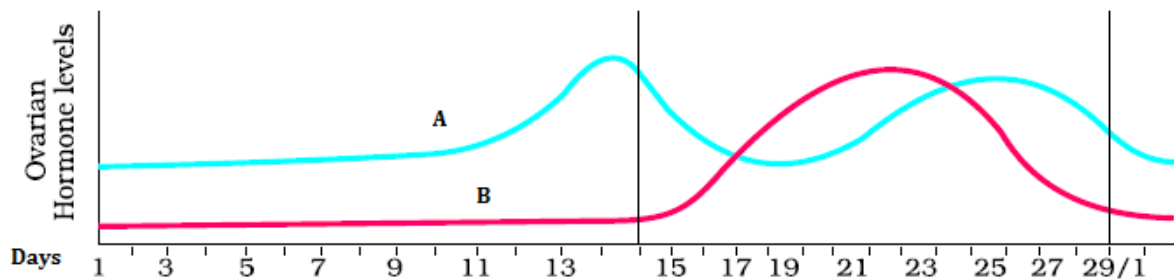
24. Given below is the diagram of a human ovum surrounded by a few sperms. Observe the diagram and answer the following questions:



- Compare the fate of sperms shown in the diagram.
- What is the role of zona pellucida 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. 1+1+1+1+1

OR

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



- a) Identify 'A' and 'B'.
- b) Specify the source of the hormone marked in the diagram.
- c) Reason out why A peaks before B.
- d) Compare the role of A and B.
- e) Under which condition will the level of B continue to remain high on the 28<sup>th</sup> day? **1+1+1+1+1**

**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. **5**

**26.** Citing lake as an example of 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**

**OR**

- a) Colonization of a rocky terrain is a natural process. Mention the group of organisms which invade this area first. Give an example.
- b) 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.
- c) Identify the climax community of hydrarch and xerarch succession. **1+3½+ ½**

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