S & K CLASSES

Creating innovative minds. . . .

TIMES ALLOWED – 3 HOURS
MAXIMUM MARKS – 70

Sample paper Biology

GENERAL INSTRUCTION:-

- **All the questions are compulsory.**
- **There are 26 questions in total.**
- **In SECTION – A Questions 1 to 5 are very short answer type questions and carry one mark each.**
- **In SECTION – B Questions 6 to 10 carry two marks each.**
- **In SECTION – C Questions 11 to 22 carry three marks each.**
- **In SECTION – D Questions 23 is value based question carrying four marks.**
- **And Questions 24 to 26 carry five marks each.**
- **There is no overall choice. However, an internal choice has been provided in one question of two marks, one question of three marks and all three questions in five marks each. You have to attempt only one of the choices in such questions.**
- **Wherever necessary. The diagrams drawn should be properly labeled.**

SECTION – A

1. Identify this reproductive structure and name the organism they are being released from. (1)

(a)

2. State the significance of Coelacanth in evolution. (1)

3. 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)

4. State a method of cellular defense which works in all eukaryotic organisms. (1)

5. PCR requires very high temperature conditions where most of the enzymes get denatured. How was this problem resolved in a PCR? (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)

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. (2)

b) A person recuperating from illness is advised to have curd regularly. Why?

10. Assess the effects of loss of biodiversity in a region. Mention any four such effects. (2)

SECTION – C

11. Diagrammatically represent the experimental set up that proved Oparin – Haldane hypothesis. (3)

12. True – breeding pea plants showing contrasting character for flower positions were cross – bred.

A) Mention the position of flowers in F_1 generation.

B) Work out the cross up to F_2 generation.

C) Compute the relative fraction of various genotypes in the F_2 generation? (3)

13. Refer to the figure given below and answer the question that follows:

Wolf Tasmanian wolf

(a) Explain the process by which Tasmanian wolf evolved.

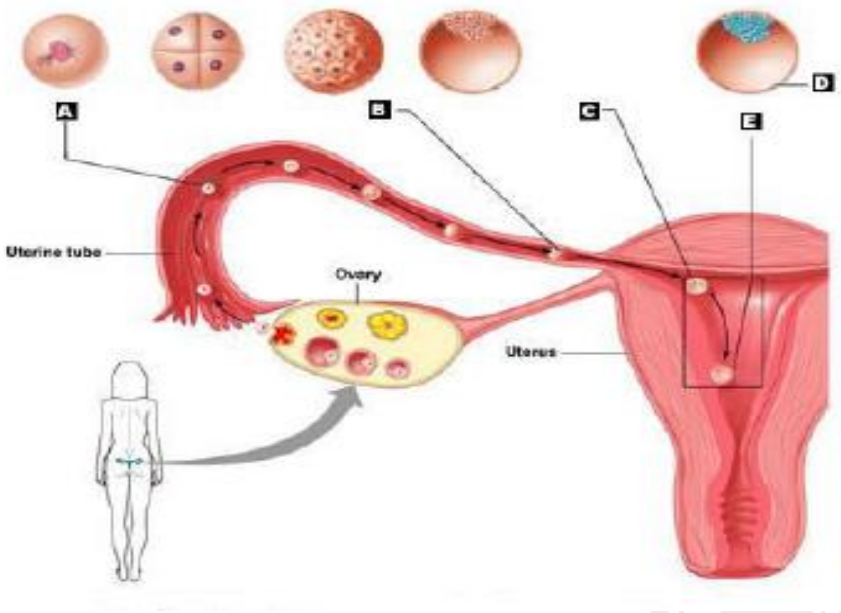
(b) Name the process that has resulted in evolution of wolf and another similar animal such as Tasmanian Wolf.

(c) Compare and contrast the two animals Shown? (3)

14. 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)

15. How does the study of different parts of a flower help in identifying wind as its pollinating agent? (3)

16. Answer the following question in relation to the diagram below.



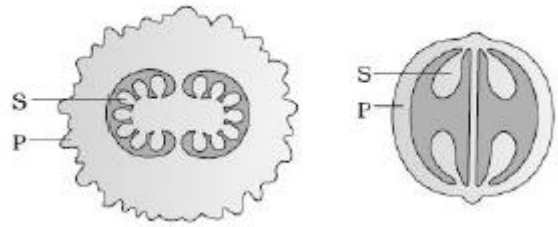
(a) Identify the structure labeled 'B' .

(b) What you call to the process by which the structure 'A' converted into 'B"

(c) What are the two different types of cells present in structure 'D'? (3)

17. 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. (3)

18. Study the following diagram and answer the question given below:



(a) What do S and P denote?

(b) Where do They develop from? (3)

19. A tRNA is charged with the amino acid methonine:

(a) What is the actual structure of the tRNA?

(b) Give the anticodon of this tRNA.

(c) Write the polarity of the tRNA to which the methonine binds (3)

OR

Answer the following questions:

(a) Name the scientist who called t-RNA an adapter molecule.

(b) Draw a structure of t – RNA showing the following:

i. Tyrosine attached to its amino acid stie

ii. Anticodon for this amino acid in its correct site (codon for tyrosine is UCA)

(c) What is the secondary structure of the tRNA?

20. A cross was carried out between a pea plant heterozygous for round and yellow seeds with a pea plant having wrinkled and green seeds.

(a) Show the cross in a punnett squre.

(b) Write the phenotype of the progeny of this cross.

(c) What is this cross known as? What conclusion can you draw from the above result? (3)

21. Study the given chart below and answer the question that follow:

(a) S strain → into mice → mice die

(b) R strain → into mince → mice live.

(c) Heat killed S strain + live R strain → into mice → A

(d) Heat killed S strain + DNase + live R strain → into mice → B

i. Name the organism and differentiate between its two strains R and S respectively.

ii. Write the results A and B obtained in step (c) and (d) respectively.

iii. Name the Scientist who performed the steps (a) , (b) and (c). (3)

22. What is incomplete dominance? Explain with one example, How it differs from complete dominance. (3)

SECTION – D

23. A person in your colony has recently been diagnosed with AIDS. People/residents in the colony want him to leave the colony for the fear of spread of AIDS.

(a) Write your view on the situation, giving reasons.

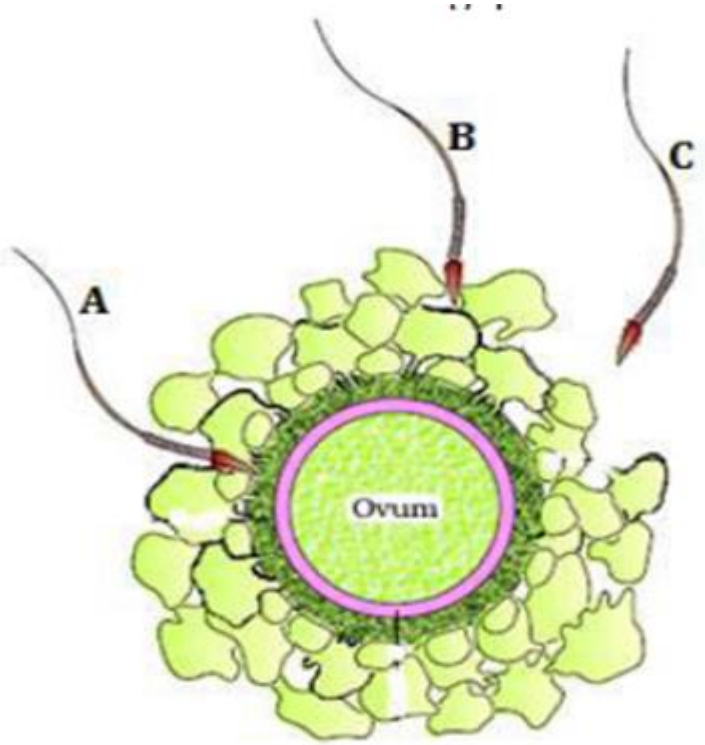
(b) Name the pathogen caused AIDS.

(c) List the methods by which AIDS didn't spread, otherwise the people thought / afraid.

(d) Write the preventive measures by which we can stop spreading of AIDS. (4)

SECTION E

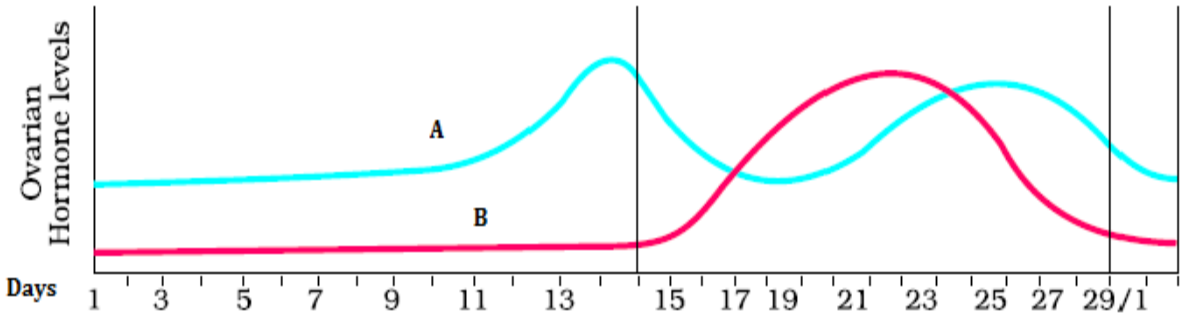
24. Given below is the diagram of a human ovum surrounded by a few sperms. Observe the diagram and answer the following questions:



(a) Compare the fate of sperms shown in the diagram.
(b) What is the role of zona pellucid in this process?
(c) Analyze the changes occurring in the ovum during the process
(d) How is the entry of sperm into the ovum facilitated?
(e) Specify the region of female reproductive system where the event represented in the diagram takes place. (5)

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 28th Day?

25. 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.

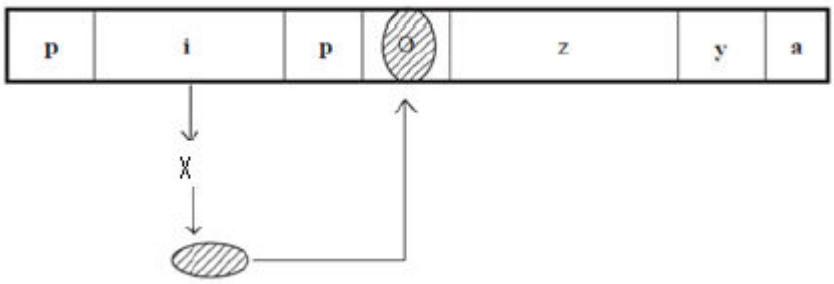
OR

(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 series progress from hydric to mesic condition.

(c) Identify the climax community of hydrarch and xerarch succession.

26. Look at the figure depicting lac operon of E.Coli and answer the following question:



(a) What is 'X' in the above lac operon model?

(b) Write the enzyme produced by gene 'Z' explain its function.

(c) Name the inducer.

(d) What could be the series of events when an inducer is present in the medium in which E.coli is growing? (5)

OR

Explain the process of protein synthesis from processed m – RNA.