S R Study Material

SAMPLE PAPER 3 2024-25

Class 12 - Biology

Time Allowed: 3 hours **Maximum Marks: 70**

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. Sparrow is: **[1]**

   a) only 1^o consumer
   b) only 2^o consumer
   c) both 1^o consumer and 2^o consumer
   d) 3^o consumer

2. Intra-uterine devices (IUDs) are used to prevent: **[1]**

   a) Sperm to reach male
   b) Sperm to reach female
   c) Sperm from leaving testes
   d) Sperm to reach ovum

3. Which of the following is not a cause of loss of biodiversity? **[1]**

   a) Habitat loss
   b) Over-exploitation
   c) Alien species invasion
   d) Represtation

4. The formula for exponential population growth is: **[1]**

   a) $\frac{dt}{dN}$ = rN
   b) $\frac{dN}{rN}$ = dt
   c) $\frac{rN}{dN}$ = dt
   d) $\frac{dN}{dt}$ = rN

5. Restriction endonucleases **[1]**

   a) Are synthesised by bacteria as part of their defense mechanism.
   b) Are used in genetic engineering for ligation of two DNA molecules.
   c) Are used for in vitro DNA synthesis.
   d) Are present in mammalian cells for degradation of DNA when the cell dies.

6. Which one of the following helps in absorption of phosphorus from soil by plants ? **[1]**

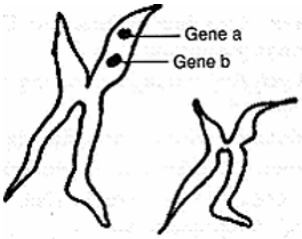
a) Rhizobium

b) Glomus

c) Frankia

d) Anabaena

7. Given below is a highly simplified representation of human sex chromosomes from a karyotype. The genes a and b could be of: **[1]**



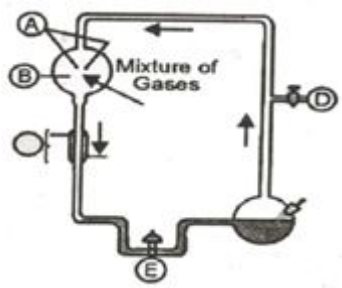
a) Colour blindness and body height

b) Attached ear lobe and Rh blood group

c) Phenylketonuria and haemophilia.

d) Haemophilia and red green colour blindness

8. What was the resultant found in the place marked E? **[1]**



a) Glucose, fatty acids and lipids

b) Some fatty acids and organic acids

c) Some amino acids as glycine and alanine

d) Organic esters only

9. These belong to the category of primary consumers: **[1]**

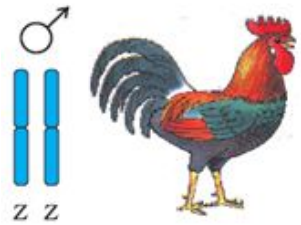
a) Water insects

b) Insects and cattle

c) Snake and Frog

d) Eagle and snake

10. On the basis of the sex chromosome shown below, the bird shown is **[1]**



a) Female

b) Cannot be decided

c) Transgender

d) Male

11. Which one is a nitrogen fixer? **[1]**

a) Anabaena

b) Hydrodictyon

c) Ulva

d) Ulothrix

12. Triticale, first man-made cereal crop, has been obtained by crossing wheat with: **[1]**

a) Sugarcane

b) Pearl millet

c) Barley

d) Rye

13. **Assertion (A):** Zero population growth should be achieved as early as possible to control the human population. **[1]**

Reason (R): This requires not two children per couple but a little more.

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):** Intercropping checks the population of insects. **[1]**

Reason (R): Plant pests can be controlled biologically by their natural parasites and pathogens.

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):** The pyramid of biomass can be inverted. **[1]**

Reason (R): The biomass of fishes far exceeds that of phytoplankton on which fishes feed.

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):** New world and old world monkeys are alike. **[1]**

Reason (R): Old world monkeys are closer to man.

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.

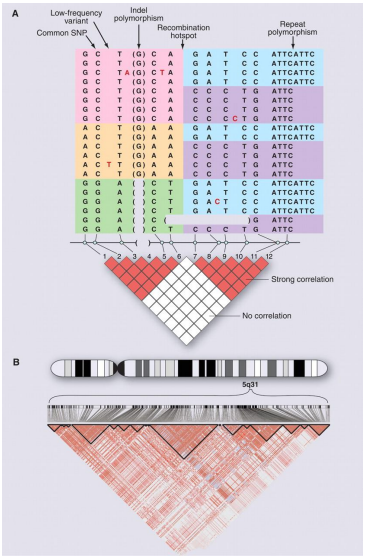
c) A is true but R is false.

d) A is false but R is true.

Section B

17. Name the source of statin and state its action on the human body. **[2]**

18. Observe the diagram for genetic mapping of human DNA and answer the following questions: **[2]**

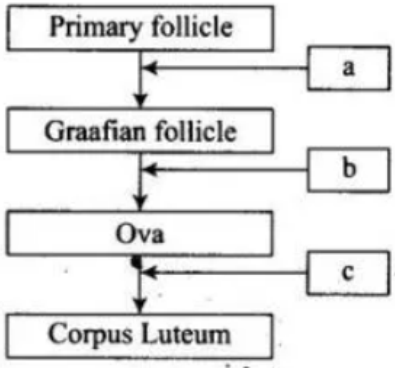


i. Explain DNA polymorphism as the basis of genetic mapping of the human genome.

ii. State the role of VNTR in DNA fingerprinting.

19. Mention any two characteristics of pollen in plants such as maize and coconut palm to suit the kind of pollination in them. **[2]**

20. Given below is a flow chart showing ovarian changes during the menstrual cycle. Fill in the spaces giving the name of the hormones responsible for the events shown. **[2]**



21. a. A patient had suffered myocardial infarction and clots were found in his blood vessels. Name a **clot buster** that can be used to dissolve the clots and the micro-organism from which it is obtained. **[2]**

b. A woman had just undergone a kidney transplant. A bioactive molecular drug is administered to oppose kidney rejection by the body. What is the bioactive molecule? Name the microbe from which this is extracted.

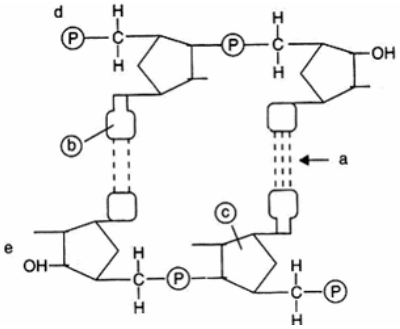
c. What do doctors prescribe to lower the blood cholesterol level in patients with high blood cholesterol? Name the source organism from which this drug can be obtained.

OR

Name the source of cyclosporine - A. How does this bioactive molecule function in our body?

Section C

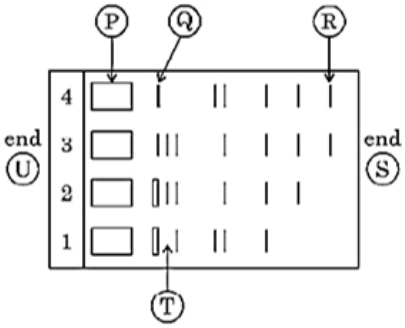
22. Study the given portion of double-stranded polynucleotide chain carefully. Identify a, b, c and the 5' end of the chain. **[3]**



23. Generally, it is observed that human males suffer from hemophilia more than human females, who rarely suffer from it. Explain giving reasons. **[3]**

24. Differentiate between an **Expanding age pyramid** and a **Stable age pyramid**. Substantiate your answer with diagrams. **[3]**

25. a. Given below is the stepwise schematic representation of the process of electrophoresis. Identify the **alphabets** representing (i) Anode end (ii) smallest/lightest DNA strand in the matrix (iii) Agarose gel **[3]**



b. What is elution? State the importance of elution in this process.

26. i. Explain the concept of endemism. **[3]**

ii. Name four regions in and around our country that are considered hot-spots.

OR

How did Dr. David Tilman relate experimentally, the stability of a community and its species richness? Explain.

27. Classify the following as examples of homology and analogy: **[3]**

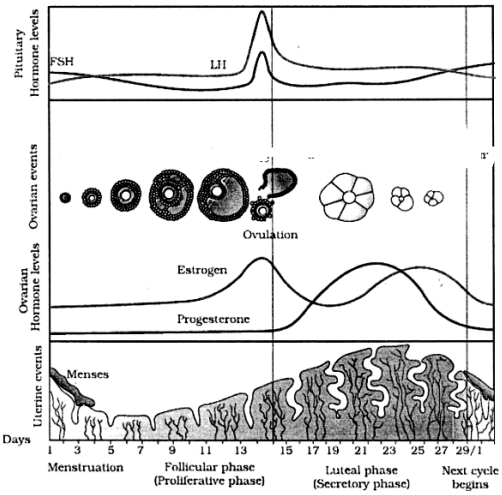
(i)	Mouth parts of cockroach and butterfly
(ii)	Hearts of rabbits and human beings
(iii)	Eyes of octopus and mammals
(iv)	Sweet potato and potato
(v)	Stings of honey bee and scorpion
(vi)	Tendrils of Lathyrus and tendrils of Gloriosa

28. How does a vaccine for a particular disease immunise the human body against that disease? **[3]**

Section D

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

The reproductive cycle in female primates (e.g. monkeys, apes and human beings) is called the menstrual cycle. In human females, menstruation is repeated at an average interval of about 28/29 days, and the cycle of events starting from one menstruation till the next one is called the menstrual cycle Anita has show Diagrammatic presentation of various events during a menstrual cycle.



i. What role do pituitary gonadotropins play during the follicular and ovulatory phases of the menstrual cycle? (1)

ii. The first half of the menstrual cycle is called the proliferative phase as well as the follicular phase. Give reason. (1)

iii. Why does corpus luteum stay active throughout pregnancy and in the absence of fertilization, is active only for 10-12 days? (2)

OR

What happens to corpus luteum in human female if the ovum is (2)

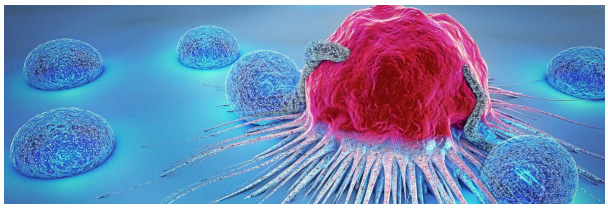
a. fertilised,

b. not fertilised?

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

Cancer refers to any one of a large number of diseases characterized by the development of abnormal cells that divide uncontrollably and have the ability to infiltrate and destroy normal body tissue. Cancer often has the

ability to spread throughout your body. Cancer is the second-leading cause of death in the world.



i. How does a cancerous cell differ from a normal cell? (1)

ii. Benign tumor is less dangerous than malignant tumor. Why? (1)

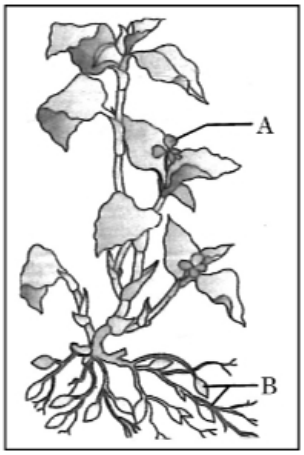
iii. Describe causes of cancer. (2)

OR

Mention two methods of treatment of the disease. (2)

Section E

31. **[5]**



Observe the picture of Commelina plant bearing two types of flowers given above.

i. Identify the two types of flowers labelled ‘A’ and ‘B’ in the picture.

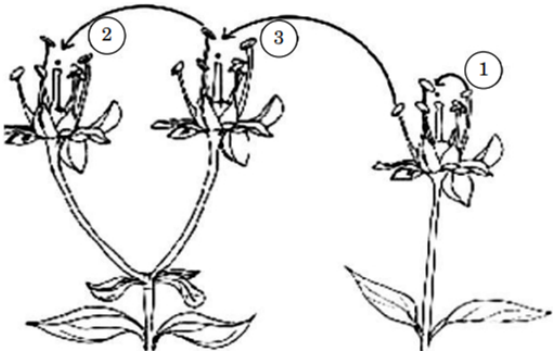
ii. Compare the two types of flowers with reference to:

1. Characteristic feature
2. modes of pollination

iii. List any two **out breeding devices** in flowering plants. Explain why do plants develop such devices.

OR

Study the diagram given below showing the modes of pollination. Answer the questions that follow.



i. The given diagram shows three methods of pollen transfer in plants. What are the technical terms used for pollen transfer methods 1, 2 and 3?

ii. How do the following plants achieve pollination successfully?

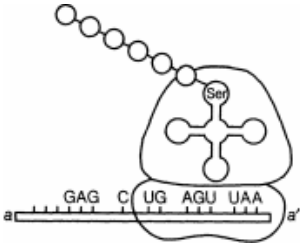
1. Water lily
2. Vallisneria

iii. Flowering plants have developed many devices to avoid inbreeding depression. Explain one hereditary and one physiological device which helps plants to achieve this target.

32. Protein synthesis requires the services of all three types of RNAs, namely t-RNA, m-RNA and r-RNA. Explain the role of each of them during the process of protein synthesis in prokaryotes. **[5]**

OR

Study the figure and answer the following questions:



i. Identify the polarity from a to a', in the diagram below and mention how many more amino acids are expected to be added to this polypeptide chain.

ii. Mention the DNA sequence coding for serine and the anticodon of tRNA for the same amino acid.

iii. Why are some untranslated sequence of bases seen in mRNA coding for a polypeptide? Where exactly are they present on mRNA?

33. Write any four ways used to introduce a desired DNA segment into a bacterial cell in recombinant technology experiments. **[5]**

OR

Suggest and describe a technique to obtain multiple copies of a gene of interest in vitro.