S R SAMPLE PAPER 1

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. Among the following, where do you think the process of decomposition would be the fastest? **[1]**

   a) Alpine region b) Antarctic

   c) Dry arid region d) Tropical rain forest

2. Female hired to develop the in-vitro fertilized egg of another female to maturity is called: **[1]**

   a) Step-mother b) Biological mother

   c) Feeding mother d) Surrogate mother

3. Conserving biodiversity provides major contribution to economy as: **[1]**

   a) Ecopurification b) Waste decomposition

   c) Climate stabilization d) Ecotourism

4. Name the kind of reproduction in bees in which males are produced. **[1]**

   a) Parthenogenesis b) Sexual reproduction

   c) Grafting d) Asexual reproduction

5. Rice is important food grains grown in India for thousands of years. Estimated varieties of rice present in India are: **[1]**

   a) 500,000 b) 100,000

   c) 200,000 d) 300,000

6. Which of the following is a gram-negative bacterium? **[1]**

   a) Streptomyces coelicolor b) Bacillus subtilis

c) Escherichia coli

d) Amycolatopsis orientali

7. Which of the following is not a Mendelian disorder? **[1]**

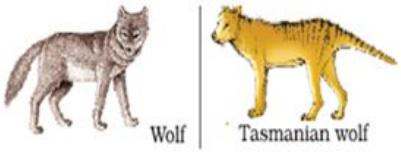
a) Hemophilia

b) Down's syndrome

c) Thalassemia

d) Colour blindness

8. Picture shown below is an example of:- **[1]**



a) Convergent evolution of Australian marsupials and placental mammals

b) Divergent evolution of Australian marsupials and placental mammals

c) Homologous organs of both animals

d) Analogous organs of both animals

9. The characteristic vegetation of arctic desert is/are: **[1]**

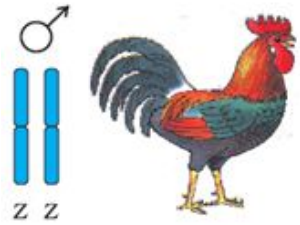
a) Acacia

b) Lichens and mosses

c) Marshy plants

d) Conifers

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. Fleming, Chain and Florey were awarded the Nobel Prize in 1945 for discovery of: **[1]**

a) Antacid

b) Antibodies

c) Insulin

d) Antibiotic

12. An interesting property of restriction enzymes is molecular cutting and pasting. Restriction enzymes typically recognize a symmetrical sequence of DNA. **[1]**

Notice that the top strand is same as the bottom strand, but reads backward. When the enzyme cuts the strand between G and A, it leaves overhanging chains:

a) none of these

b) Both sticky & blunt ends

c) Sticky ends

d) Blunt ends

13. **Assertion (A):** To achieve a zero population growth rate, the replacement level should be slightly higher than 2. **[1]**
Reason (R): Replacement level means the number of children that can replace parents equally.

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):** Large holes in **Swiss cheese** are due to the production of a large amount of carbon dioxide by specific microbe. **[1]**

Reason (R): The specificity of characteristic texture, flavour and taste of **Swiss cheese** is due to the use of bacterium Propionibacterium shermanii.

a) Both Assertion and Reason are true, and Reason is the correct explanation of the Assertion.

b) Both Assertion and Reason are true, but Reason is **not** the correct explanation of the Assertion.

c) Assertion is true but Reason is false.

d) Both Assertion and Reason are false.

15. **Assertion (A):** Temperature and soil moisture are the most important climatic factors that regulate decomposition. **[1]**

Reason (R): Their effects on the activities of soil microbes.

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):** The rocks of early era contain less number of fossils. **[1]**

Reason (R): Life originated in the sea.

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.

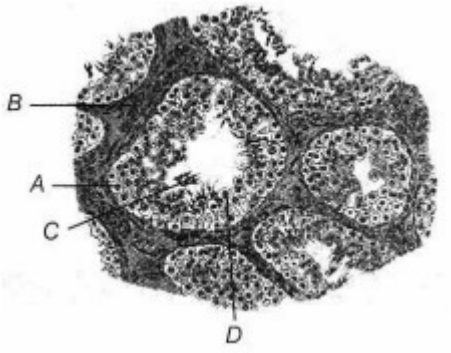
Section B

17. What are genetically modified organisms (GMO)? **[2]**

18. Write the RNA strand transcribed from the given transcription unit along with its polarity. **[2]**

19. In the diagram given below, show the path of a pollen tube from the pollen on the stigma into the embryo sac. Name the components of egg apparatus. **[2]**

20. Study the sectional view of human testis showing seminiferous tubules given below. **[2]**



i. Identify A, B and C.

ii. Write the function of A and D.

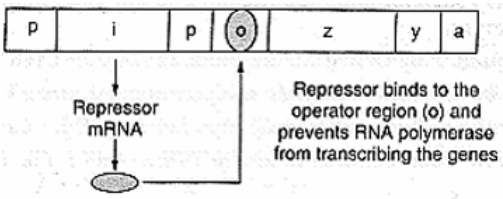
21. What is the chemical nature of biogas. Name an organism which is involved in biogas production? **[2]**

OR

What is LAB? What is its role in human stomach?

Section C

22. Look at the figure below depicting lac operon of E.coli. **[3]**



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

ii. Name the inducer.

23. A child has blood group O. If the father has blood group B, work out the genotypes of the parents and the possible genotypes of the other offsprings. **[3]**

24. Define the following terms and give one example for each: **[3]**

a. Commensalism

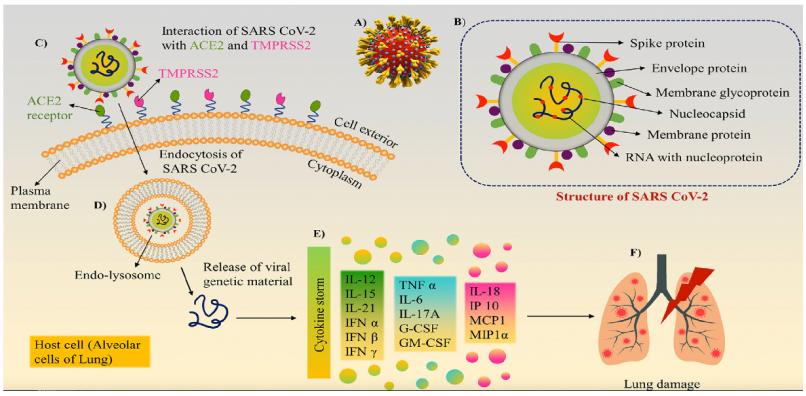
b. Parasitism

c. Camouflage

d. Mutualism

e. Interspecific competition

25. This image shows how lungs are damaged by SARS CoV-2 and how molecular diagnostic techniques help to diagnose it. **[3]**



i. List the three molecular diagnostic techniques that help to detect pathogens from suspected patients.

ii. Mention one advantage of these techniques over conventional methods.

26. Why has conservation of biodiversity become important recently? **[3]**

OR

Differentiate between in situ and ex situ approaches of conserving biodiversity.

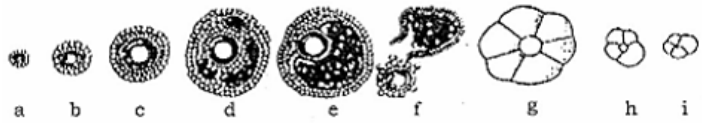
27. How does industrial melanism in Biston betularia illustrate the action of natural selection? Explain briefly. **[3]**

28. Differentiate between vaccination and immunization. Describe the two types of vaccines with suitable examples? **[3]**

Section D

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

The following is the illustration of the sequence of ovarian events (a-i) in a human female.



(i) Identify the figure that illustrates ovulation and mentions the stage of oogenesis it represents.

(ii) Name the ovarian hormone and the pituitary hormone that have caused the above-mentioned event.

(iii) Explain changes that occur in the uterus simultaneously in anticipation.

OR

Draw a labelled sketch of the structure of a human ovum prior to fertilization.

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

Malaria and dengue fever are major mosquito-borne public health problems in tropical countries. The authors report a malaria and dengue co-infection in an 11-year-old boy who presented with sustained fever for 10 days. The physical examination revealed a flushed face, injected conjunctivae and left submandibular lymphadenopathy. His peripheral blood smear showed few ring-form trophozoites of Plasmodium falciparum. His blood tests were positive for dengue NS-1 antigen and IgM antibody, and negative for IgG antibody. After the initiation of antimalarial treatment with artesunate and mefloquine, his clinical condition gradually improved. However, he still had low-grade fever that persisted for 6 days. Finally, he recovered well without fluid leakage, shock or severe bleeding.

(i) Name the fish that help in eradication of mosquito larvae.

(ii) What is the reason of symptoms of malaria?

(iii) Name the body parts and host in which following events takes place in life cycle of plasmodium.

a. asexual reproduction

b. sexual reproduction.

OR

Name some vector borne diseases and their vector.

Section E

31. What is polyembryony and how can it be commercially exploited? **[5]**

OR

With a neat, labeled diagram, describe the parts of a mature angiosperm embryo sac. Mention the role of synergids.

32. Meselson and Stahl carried out an experiment to prove the nature of DNA replication. Recall the experiment and answer the following questions. **[5]**

i. Which two types of nitrogen were used by them in their experiment and why?

ii. Why did they take samples of E. coli at definite time intervals for their observation?

iii. State the role of caesium chloride density gradient in their experiment.

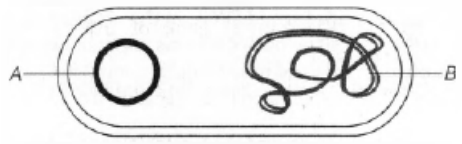
iv. Write the conclusions they arrived at.

OR

Explain the expression of lac operon genes in E. coli growing in the lactose-containing culture medium.

33. Recombinant DNA (rDNA) is a technology that uses enzymes to cut and paste together DNA sequences of interest. The recombined DNA sequences can be placed into vehicles called vectors that ferry the DNA into a suitable host cell where it can be copied or expressed. **[5]**

i. A bacterial cell is shown in the figure given below. Label the part ‘A’ and 'B'. Also, mention the use of part A in rDNA technology.



ii. Suppose a linear DNA fragment and a plasmid has three restriction sites for EcoRl. How many fragments will be produced from linear DNA and plasmid, respectively?

OR

i. Explain how to find whether an *E.coli* bacterium has transformed or not when a recombinant DNA bearing ampicillin resistant gene is transferred into it.

ii. What does the ampicillin resistant gene act as in the above case?

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