

Biology Sample Paper – 4
Full Syllabus

Max. Marks 35

Time allowed: 2 hours

General Instruction:

- i) All questions are compulsory.
- ii) The question paper has three sections and 13 questions. All questions are compulsory.
 - a. Section–A has 6 questions of 2 marks each
 - b. Section–B has 6 questions of 3 marks each
 - c. Section–C has a case-based question of 5 marks.
- iii) 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.
- iv) Wherever necessary, neat and properly labelled diagrams should be drawn in Pencil only.

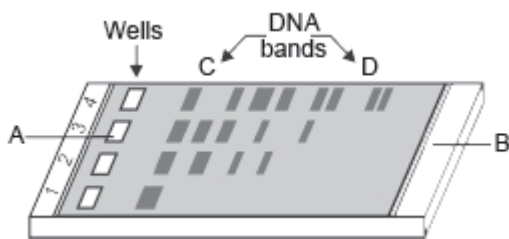
Set-A

Section-A

1) Identify a, b, c and d in the following table:

Name of the human disease	Name of the causal bacteria/virus	Specific organ or its part affected
1. Typhoid	<i>Salmonella typhi</i>	a
2. Common cold	b	c
3. Pneumonia	<i>Streptococcus pneumoniae</i>	d

- 2) What is ‘withdrawal syndrome’? List any two symptoms it is characterised by.
- 3) How is an autoimmune disease caused? Mention one such disease in humans.
- 4) Name the enzyme produced by *Streptococcus* bacterium. Explain its importance in medical sciences.
- 5) Study the diagram given below and answer the following questions:

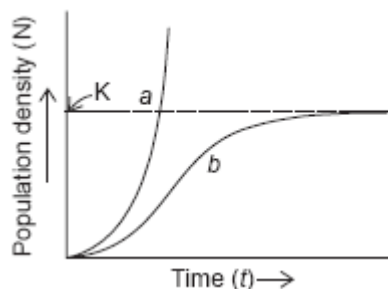


- (a) Why have DNA fragments in band ‘D’ moved farther away in comparison to those in band ‘C’?
- (b) Identify the anode end in the diagram.
- (c) How are these DNA fragments visualised?

OR

Why there is a need for specialised polymerase in the PCR? Name the enzyme and mention the source.

- 6) A population of 100 spotted deer was living without any carnivores in an enclosure of a few hectares of rich tropical forest land. Deer census was taken after a few years. Now study the graph given below and answer the questions that follow:



- (a) Identify the curve that represents the deer population.
(b) Is it a realistic one? Justify.

OR

Differentiate between predators and parasites.

Section - B

- 7) Draw a labelled sketch of a typical biogas plant.
8) A person is suffering from Ascariasis. Mention the pathogen causing the disease and an organ of the body affected, three symptoms and one mode of transmission of the disease.

OR

- (a) How do ladybird beetles and dragon flies act as biocontrol agents?
(b) Mention the constituents of 'flocs'.
- 9) How do antibiotic-resistance genes function as selectable markers? Explain with the help of *E.coli* cloning vector pBR322.
- 10) (a) Given below is a single stranded DNA molecule. Frame and label its sense and antisense RNA molecule.
5' ATGGGGCTC 3' sense strand.
(b) How the RNA molecules made from above DNA strand help in silencing of the specific RNA molecules?
- 11) Recombinant DNA technology is of great importance in the field of medicine. With the help of a flow chart, show how this technology has been used in preparing genetically engineered human insulin.
- 12) Explain 'rivet popper' hypothesis. Name the ecologist who proposed it.

Section- C

Read the following passage and answer the questions that follow:

- 13) The key elements that lead to so much variation in the physico-chemical conditions of different habitats include temperature, water, light and soil conditions. Temperature is the most ecologically relevant environmental factor. Water is the second most important factor influencing the life of organisms. Light is the ultimate source of energy for all living beings. Various characteristics of soil determine the type of vegetation in a given area and thereby the fauna.
- Some organisms can tolerate and thrive in a wide range of temperatures while many others are restricted to a narrow range of temperatures. Give the technical term to describe these two groups of organisms.
 - How does temperature affect the lives of organisms?
 - What are euryhaline and stenohaline animals?
 - Mention any two activities of animals, which get cues from the diurnal and seasonal variations in light intensity.
 - Mention two characteristics of soil which determine the water-holding capacity of the soil.

OR

The accelerated rates of species extinctions that the world is facing now, are largely due to human activities. The last twenty years alone have witnessed the disappearance of 27 species of organisms. Humans have always depended on nature for food and shelter; but, when 'need' turns to 'greed', it leads to over-exploitation of the natural resources.

- There are four major causes, for loss of biodiversity, collectively known by the 'The Evil Quartet'. List them.
- The Amazon rain forest is referred to as 'the lungs of the planet, Earth'. Mention any two human activities, which lead to loss of biodiversity in this region.
- Why should we conserve the biodiversity from a narrow utilitarian view point?
- Name two animals that have become extinct in the last 500 years, due to over-exploitation.