CBSE EXAMINATION PAPER-2022

BIOLOGY

(Solved)

Time allowed : 3 hours | Maximum Marks : 65

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **29 questions.** All questions are **compulsory.**

ii. This question paper is divided into **5 sections.**

iii. **Section A** – questions number **1 to 1** are case based questions

iv. **Section B** – questions number **2 to 11** are multiple choice questions

v. **Section C** – questions number **12 to 18** are very short answer

vi. **Section D** – questions number **19 to 25** are short answer

vii. **Section E** – questions number **26 to 29** are long answer

viii. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.

ix. Use of calculator is NOT allowed.

Section A

Question 1.

Section B

Question 2.

The primary source of energy for Earth's climate system is:

[1 Marks]

(A) Nuclear energy

(B) Geothermal energy

(C) Solar energy

(D) Wind energy

Question 3.

Which of the following statements is true about genes?

[1 Marks]

(A) None of the above.

(B) Genes do not play a role in inheritance.

(C) Genes are segments of DNA that code for proteins.

(D) All genes are expressed at all times.

Question 4.

The process by which organisms maintain a stable internal environment is called:

[1 Marks]

(A) Respiration

(B) Photosynthesis

(C) Homeostasis

(D) Metabolism

Question 5.

What is the main function of the ribosome?

[1 Marks]

(A) Cell division

(B) Energy production

(C) DNA replication

(D) Protein synthesis

Question 6.

Which of the following structures is involved in photosynthesis?

[1 Marks]

(A) Endoplasmic reticulum

(B) Nucleus

(C) Chloroplasts

(D) Mitochondria

Question 7.

Which molecule is known as the energy currency of the cell?

[1 Marks]

(A) DNA

(B) RNA

(C) NADPH

(D) ATP

Question 8.

Which of the following is the start codon for protein synthesis?

[1 Marks]

(A) UAA

(B) UAG

(C) UGA

(D) AUG

Question 9.

In the Meselson and Stahl experiment, the DNA extracted after one generation of replication in ^{15}N medium showed:

[1 Marks]

(A) One heavy band

(B) Two distinct bands

(C) One light band

(D) One intermediate band

Question 10.

Bt-cotton is resistant to:

[1 Marks]

(A) Aphids

(B) Bollworms

(C) Bacterial blight

(D) Fungal infections

Question 11.

Which of the following is a vector used to transfer genes into plant cells?

[1 Marks]

(A) Plasmid

(B) Cosmid

(C) Agrobacterium tumefaciens

(D) Bacteriophage

Section C

Question 12.

Mention the parts of human body that get affected by Pneumonia and common cold infections. Write the causative agents of the two diseases.

[2 Marks]

Question 13.

State the impact of constant mechanical agitation and pumping of air in the aeration tank on the sewage during the biological treatment.

[2 Marks]

Question 14.

(a) Give an example of viral biocontrol agent.

(b) Why are they considered to be desirable when an ecologically sensitive area is being treated?

[2 Marks]

Question 15.

What is the importance of female *Anopheles* mosquitoes m the life of a malarial Parasite *Plasmodium* ?

[2 Marks]

Question 16.

Study the graph given below, showing the population growth curves 'A' and 'B' respectively. Answer the following questions:

(a) What is 'Carrying Capacity' in respect of Curve 'B' indicative of?

(b) Mention the action of possible natural forces that could have lead to curve 'B'.

[2 Marks]

Question 17.

The histogram given below representing the data for annual shark harvest in the great barrier reef / coral reef located on the east coast of Queensland, Australia. Study the histogram and answer the questions that follow.

(a) Write your interpretation of the data given.

(b) Write the impact on the biodiversity of the area that you can interpret on the basis of given data.

[2 Marks]

Question 18.

(i) cattle excreta is important source for producing a domestic fuel . Name the fuel and write its main components.

(ii) Write the biological process that responsible for the production of this fuel.

[2 Marks]

Section D

Question 19.

The data collected based on the survey conducted for species richness of group of mammals, in three different climatic regions of the world is shown in the bar graph given below.

Panama has nearly 560 species of mammals, Canada has nearly 301 species of mammals and Denmark has 67 species of mammals.

(i) Based on the species, richness, identify the location of these countries in the respective climatic regions given.

(ii) Plantsand animalsdonothaveauniformdiversityintheworld.Write the term given to this pattern of diversity and why?

[3 Marks]

Question 20.

5. Bio-diversification of life started to occur almost 3 billion years ago. Since then new species have been evolving and then disappearing en masse from earth.

(a) How many episodes of mass extinctions of species have already taken place and which one is in progress in the current era?

(b) How is current episode in progress different from the previous episodes and why ? Explain.

[3 Marks]

Question 21.

Name two naturally occurring sources, one that transfers pathogenic genes into a plant cells and the other into an animal cell respectively, for their benefit. Write how have these

naturally occurring sources been used for the benefit of human race by the biotechnologists.

[3 Marks]

Question 22.

Enumerate the main sources of bio-fertilisers giving one example of each.

[3 Marks]

Question 23.

Explain giving reason the action plan followed by organic farmers that support their key belief "biodiversity furthers health of crop lands".

[3 Marks]

Question 24.

(i) State the role of a selectable marker in r-DNA technology.

(ii) Name one such selectable marker which is considered to be useful for E.coli.

(iii)Give one reason why is it considered to be a useful marker.

[3 Marks]

Question 25.

What are plasminds ? How they different from cloning vectors ? give one example each for a viral and bacterial cloning vector ?

[3 Marks]

Section E

Question 26.

Explain the process of DNA replication in eukaryotes. Why is it called semiconservative?

[5 Marks]

Question 27.

Describe the structure of a human male reproductive system.

[5 Marks]

Question 28.

Explain Mendel's laws of inheritance with suitable examples.

[5 Marks]

Question 29.

Describe the steps involved in recombinant DNA technology.

[5 Marks]
