CBSE EXAMINATION PAPER-2025

BIOLOGY

(Solved)

Time allowed : 3 hours | Maximum Marks : 83

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **40 questions.** All questions are **compulsory.**

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

iii. **Section A** – questions number **1 to 3** are case based questions

iv. **Section B** – questions number **4 to 19** are multiple choice questions

v. **Section C** – questions number **20 to 27** are very short answer

vi. **Section D** – questions number **28 to 34** are short answer

vii. **Section E** – questions number **35 to 40** 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.

Question 2.

Immunity in our body is of two types : (i) Innate immunity and (ii) acquired immunity. Innate immunity is a non-specific defence mechanism, whereas acquired immunity is pathogen-specific; it is called specific immunity too. Acquired immunity is characterised by memory. Antibodies are specific to antigens and there are different types of antibodies produced in our body : they are IgA, IgE, IgG and

IgM. It shows primary response when it encounters the pathogen for the first time and secondary response during the subsequent encounters with the same Antigen/Pathogen.

(1)

Name the two types of specialised cells which carry out the primary and secondary immune response.

[1 Marks]

(2)

Why is the antibody-mediated immunity also called as humoral immune response ?
Attempt either sub-part (c) or (d) :

[1 Marks]

(3)

The organ transplants are often rejected if not taken from suitable compatible persons.

(i) Mention the characteristic of our immune system that is responsible for the graft rejection.

(ii) Name the type of immune response and the cell involved in it.

[2 Marks]

(4)

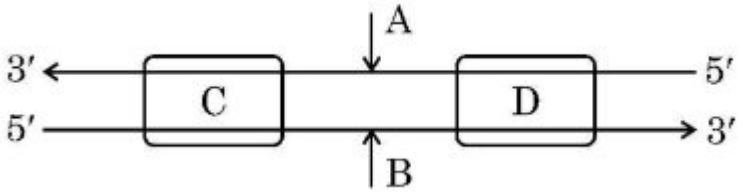
How is active immunity different from passive immunity ?

[1 Marks]

Question 3.

The process of copying the genetic information from one strand of DNA into RNA is termed as transcription. The principle of complementarity of bases governs the process of transcription, also except that uracil comes in place of thymine.

Study the complete transcription unit given below and answer the following questions :



(1)

Name the main enzyme involved in the process of transcription.

[1 Marks]

(2)

Identify coding strand and template strand of DNA in the transcription unit.

[1 Marks]

(3)

Identify (C) and (D) in the diagram, mention their significance in the process of transcription.

[2 Marks]

(4)

Describe the location of (C) and (D) in the transcription unit.

[2 Marks]

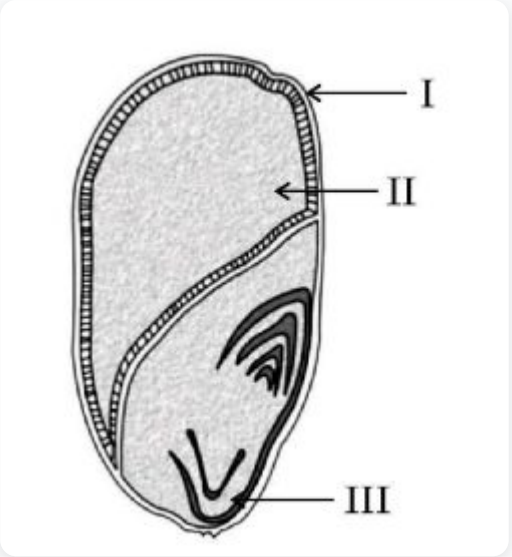
Section B

Question 4.

Given below is a diagram of T.S. of a monocot seed with parts I, II & III labelled:

Choose the option where parts I, II and III are identified correctly.

[1 Marks]



(A) Pericarp, Endosperm, Scutellum

(B) Pericarp, Endosperm, Coleorhiza

(C) Scutellum, Pericarp, Coleorhiza

(D) Coleorhiza, Scutellum, Pericarp

Question 5.

The number of autosomes present in a human secondary spermatocyte?

[1 Marks]

(A) 44

(B) 23

(C) 22

(D) 46

Question 6.

A child with blood group A has father with blood group B and the mother with blood group AB. Choose the option that gives the correct genotypes of father, mother and the child:

[1 Marks]

(A) Father - $I^B I^B$, Mother -$I^A I^B$, Child - $I^A I^A$

(B) Father - I^B i , Mother - $I^A I^B$, Child - I^A i

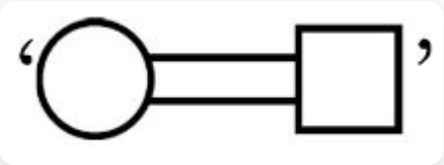
(C) Father - $I^A I^B$, Mother - I^A i , Child - $I^A I^A$

(D) Father - I^A i, Mother - I^B i, Child - I^A i

Question 7.

In a pedigree chart represents:

[1 Marks]



(A) affected individuals

(B) unrelated mating

(C) Non-identical twins

(D) mating between relatives (consanguineous mating)

Question 8.

Which one of the following options shows the correct evolutionary order of the plants mentioned below?

(i) Ferns

(ii) Ginkgo

(iii) Zosterophyllum

(iv) Gnetales

[1 Marks]

(A) (i), (iii), (ii), (iv)

(B) (iii), (i), (ii), (iv)

(C) (iv), (ii), (i), (iii)

(D) (i), (ii), (iii), (iv)

Question 9.

The phosphoester linkage in the nucleotides is between:

[1 Marks]

(A) phosphate group and OH of 3’C of a nucleoside.

(B) phosphate group and H of 5'C of a nucleoside.

(C) phosphate group and OH of 5'C of a nucleoside.

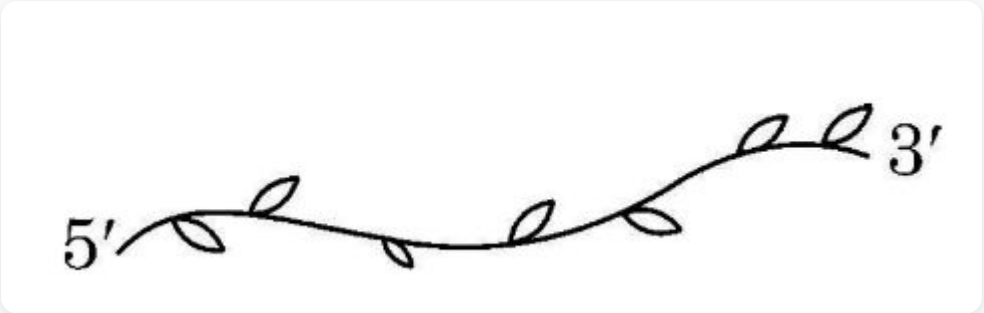
(D) phosphate group and H of 3'C of a nucleoside.

Question 10.

Given below is a heterogeneous RNA formed during Eukaryotic transcription:

How many introns and exons respectively are present in the hnRNA?

[1 Marks]



(A) 8,8

(B) 7,7

(C) 7,8

(D) 8,7

Question 11.

Study the items of Column-I and those of Column-II:

Choose the option that correctly matches the items of Column-I with those of Column-II :

[1 Marks]

Column-I		Column-II	
(a)	RNA polymerase I	(i)	18s rRNA
(b)	RNA polymerase II	(ii)	SnRNAs
(c)	RNA polymerase III	(iii)	hnRNA

(A) (a) (ii), (b) (i), (c) (iii)

(B) (a) (ii), (b) (iii), (c) (i)

(C) (a) (i), (b) (iii), (c) (ii)

(D) (a) (i), (b) (ii), (c) (iii)

Question 12.

For commercial and industrial production of citric acid, which one of the following microbes is used?

[1 Marks]

(A) Aspergillus niger

(B) Saccharomyces cerevisiae

(C) Clostridium butylicum

(D) Lactobacillus sp.

Question 13.

If Meselson and Stahl's experiment is continued for 80 minutes (till III generation) then what would be the ratio of DNA containing N^{15}/N^{15} : N^{15}/N^{14} : N^{14}/N^{14} in the medium?

[1 Marks]

(A) 0 : 1 : 3

(B) 0 : 1 : 8

(C) 1 : 1 : 0

(D) 1 : 4 : 0

Question 14.

Select the correct statement from the following biotechnological procedures:

[1 Marks]

(A) PCR is used for isolation and separation of gene of interest.

(B) The polymerase enzyme joins the gene of interest and the vector DNA.

(C) Gel electrophoresis is used for amplification of a DNA segment.

(D) Plasmid DNA acts as vector to transfer the piece of DNA attached to it.

Question 15.

The decrease in the T-Lymphocytes count in human blood will finally result in:

[1 Marks]

(A) decrease in antigens

(B) decrease in antibodies

(C) increase in antibodies

(D) increase in antigens

Question 16.

Assertion (A): Corpus luteum secretes the hormone, progesterone.

Reason (R): Hormone Progesterone is essential for maintenance of the endometrium.

[1 Marks]

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).

(B) (A) is true, but (R) is false.

(C) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(D) (A) is false, but (R) is true.

Question 17.

Assertion (A): The number of white-winged moths decreased after industrialisation in England.

Reason (R): Effects of industrialisation were more marked in rural areas of England.

[1 Marks]

(A) (A) is false, but (R) is true.

(B) (A) is true, but (R) is false.

(C) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(D) Both (A) and (R) are true and (R) is the correct explanation of (A).

Question 18.

Assertion (A): Streptococcus pneumoniae and Haemophilus influenzae are responsible for causing infectious disease in human beings.

Reason (R): A healthy person acquires the infection by inhaling the aerosols released by an infected person.

[1 Marks]

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).

(B) (A) is false, but (R) is true.

(C) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(D) (A) is true, but (R) is false.

Question 19.

Assertion (A): Restriction endonuclease recognises palindromic sequence in DNA and cuts them.

Reason (R): Palindromic sequence has two unique recognition sites PstI and PvuI recognised by restriction endonuclease.

[1 Marks]

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).

(B) (A) is true, but (R) is false.

(C) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(D) (A) is false, but (R) is true.

Section C

Question 20.

(i) Write two crucial changes, the seed undergoes while reaching maturity that enable them to be in a viable state until the onset of favourable conditions.

(ii) Name the oldest viable seed excavated from Arctic Tundra as per the records.

[2 Marks]

Question 21.

(i) Pea flower produce assured seed sets. Give reason.

(ii) In case of Polyembryony, an embryo ‘P’ develops from a synergid and the embryo ‘Q’ develops from the nucellus. State the ploidy of embryo ‘P’ and ‘Q’.

[2 Marks]

Question 22.

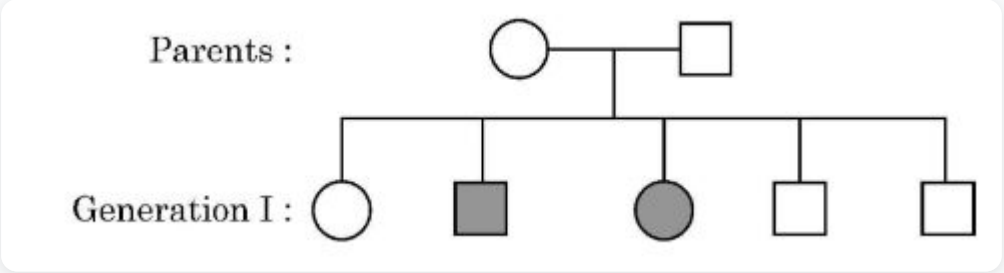
Study the given pedigree chart in which neither of the parents shows the trait but the trait is present in both male and female children.

Answer the following questions :

(a) Write about the trait, also explain the inheritance of such trait in the

(b) Give one example of such trait in human beings.

[2 Marks]



Question 23.

Describe any two situations where a medical doctor would recommend injection of a pre-formed antibodies (antitoxins) into the body of a patient.

[2 Marks]

Question 24.

The symptoms of malaria do not appear immediately after the entry of sporozoites into the human body when bitten by female Anopheles mosquito. Explain why it happens.

[2 Marks]

Question 25.

Observe the given sequence of nitrogenous bases on a DNA fragment and answer the following questions :

(a) Name the restriction enzyme which can recognise the DNA sequence.

(b) Write the sequence after restriction enzyme cut the palindrome.

(c) Why are the ends generated after digestion called as ‘Sticky Ends’ ?

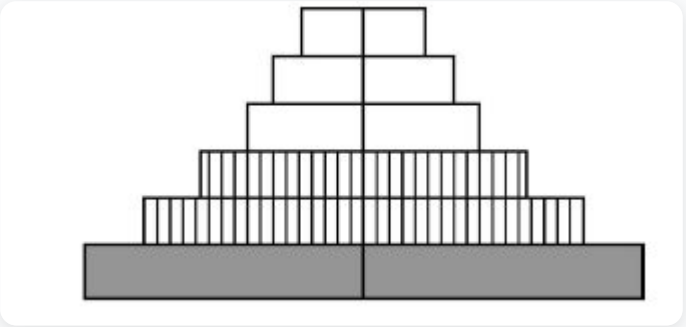
[2 Marks]

5'	C	A	G	A	A	T	T	C	T	T	A	3'
3'	G	T	C	T	T	A	A	G	A	A	T	5'

Question 26.

Identify the type of pyramid given below and write two identifying features of such a pyramid :

[2 Marks]



Question 27.

(i) Construct an ideal pyramid of energy when 10,00,000 Joules of sunlight is available.

(ii) Mention the energy obtained by the fourth level of this pyramid.

[2 Marks]

Section D

Question 28.

(a) A bilobed dithecous anther has 200 microspore mother cells per microsporangium. How many male gametophytes can be produced by this anther ?

(b) Write the composition of intine and exine layers of a pollen grains.

[3 Marks]

Question 29.

(a) List two reasons that make copper releasing IUDs as effective contraceptives.

(b) Explain how the intake of oral contraceptive pills prevent pregnancy in humans.

[3 Marks]

Question 30.

Using a Punnett square workout the distribution of an autosomal phenotypic feature in the first filial generation after a cross between a homozygous female and a heterozygous male for a single locus.

[3 Marks]

Question 31.

How does the process of Natural Selection affect Hardy-Weinberg equilibrium ? Explain with the help of graphs.

[3 Marks]

Question 32.

Samples of blood and urine of a sportsperson are collected before any sports event for drug tests.

(a) Why there is a need to conduct such tests ?

(b) Name the drugs the authorities usually look for.

(c) Write the generic names of two plants from which these drugs are obtained.

[3 Marks]

Question 33.

(a) The insulin synthesised in our body is different from that synthesised by Eli Lilly company using recombinant DNA technology. Differentiate between them.

(b) Why the insulin extracted from an animal source is not in use these days ?

[3 Marks]

Question 34.

(a) Draw a graph for a population whose population density has reached the carrying capacity.

(b) Out of the two population growth curves, which one is considered a more realistic for most populations ? Why ?

(c) Draw a growth curve where resources are not limiting for the growth of a population and give its equation.

[3 Marks]

Section E

Question 35.

(i) Describe the process of megasporogenesis in an angiosperm.

(ii) Draw a diagram of a mature embryo sac of an angiosperm.

[5 Marks]

Question 36.

The reproductive cycle in the female primates is called menstrual cycle. The first menstruation begins at puberty.

Answer the following questions :

(i) Name the four phases of menstrual cycle in a proper sequence.

(ii) How long does the menstrual phase last in a menstrual cycle ?

(iii) When and why hormones estrogen and progesterone reach their peak levels respectively, in the menstrual cycle ?

(iv) Give the significance of LH surge.

[5 Marks]

Question 37.

(i)Explain how is a bacterial cell made ‘competent’ to take up recombinant DNA from the medium.

(ii) Explain the steps of amplification of gene of interest using PCR technique.

[5 Marks]

Question 38.

(i) What are transgenic animals ?

(ii) Why are these animals being produced ? Explain any four reasons.

[5 Marks]

Question 39.

(i) Explain giving three reasons why tropics show greatest levels of species diversity.

(ii) Draw a graph showing species-area relationship. Name the naturalist who studied such relationship. Write the observation made by him.

[5 Marks]

Question 40.

(i) The world is facing the accelerated rate of species extinctions due to human activities. Explain any three major causes of biodiversity losses.

(ii) Describe ‘Ex situ’ approach for conserving biodiversity. Give any two examples.

[5 Marks]