CBSE EXAMINATION PAPER-2025

BIOLOGY

(Solved)

Time allowed : 3 hours | Maximum Marks : 81

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.

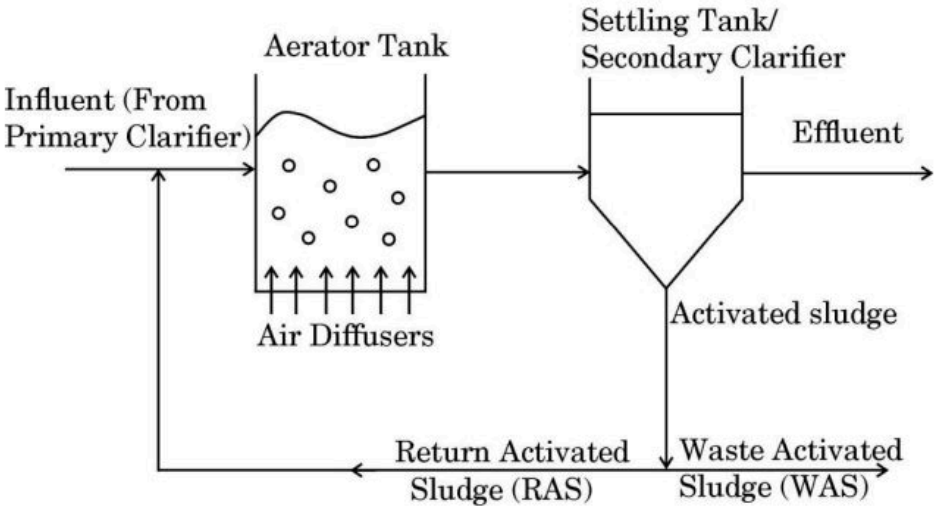
ix. Use of calculator is NOT allowed.

Section A

Question 1.

Question 2.

Study the figure given below and answer the questions that follow



(1)

(a) Identify the figure and state its importance.

[1 Marks]

(2)

Why is air diffused into the aerator tank ? Explain.

[2 Marks]

(3)

How is BOD related to organic matter present in the water ?

[1 Marks]

(4)

What changes take place in the settling tank ?

[1 Marks]

Question 3.

The following question is based on pollination. Study the figures carefully and answer the questions that follow.

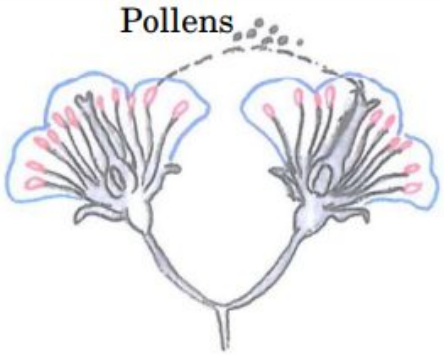


Figure A



Figure B

(1)

Give the scientific terms for the processes taking place in Figures A and B respectively.

[1 Marks]

(2)

Mention two conditions necessary for the process occurring in Figure B.

[1 Marks]

(3)

State one advantage and one disadvantage of the process occurring in Figure B.

[1 Marks]

(4)

Name the plant where , in some flower only the flower in progress in figure B takes place and give the reason responsible for it.

[1 Marks]

Section B

Question 4.

What are minisatellites ?

[1 Marks]

(A) 10 40 bp sized small sequences within the genes.

(B) Short coding repetitive sequences region on the eukaryotic genome.

(C) Regions of coding strand of DNA.

(D) Short non-coding repetitive sequences forming a large portion of eukaryotic genome.

Question 5.

Identify the incorrect statement regarding PCR.

[1 Marks]

(A) Two sets of primers are required during polymerisation.

(B) The process of replication is repeated multiple times to produce one billion copies.

(C) Thermostable DNA polymerase is used for extension of primers.

(D) Annealing is required to separate both the strands of template DNA.

Question 6.

The following information is about drugs and tobacco. Select the correct statement from the options given below.

[1 Marks]

(A) Cocaine is given to patients after surgery as it stimulates recovery.

(B) Chewing tobacco lowers blood pressure and heart rate.

(C) Barbiturates when given to criminals makes them tell the truth.

(D) Morphine is often given to persons who have undergone surgery as a painkiller.

Question 7.

Given below are the events that are observed in an artificial hybridisation programme. Arrange them in the correct sequential order and select the correct option.

(i) Re-bagging

(ii) Selection of parents

(iii) Bagging

(iv) Dusting the pollens on stigma

(v) Emasculation

(vi) Collection of pollens from male parent

[1 Marks]

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

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

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

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

Question 8.

Which of the following conditions correctly describes the manner of determining the sex in the given options?

[1 Marks]

(A) XO type of chromosomes determine male sex in grasshoppers.

(B) XO condition in humans determines female sex.

(C) Homozygous sex chromosomes (ZZ) determine female sex in birds.

(D) Homozygous sex chromosomes (XX) produce male in Drosophila.

Question 9.

Choose the option that correctly describes the gynoecium of Michelia :

[1 Marks]

(A) Multicarpellary, Apocarpous

(B) Bicarpellary, Syncarpous

(C) Bicarpellary, Apocarpous

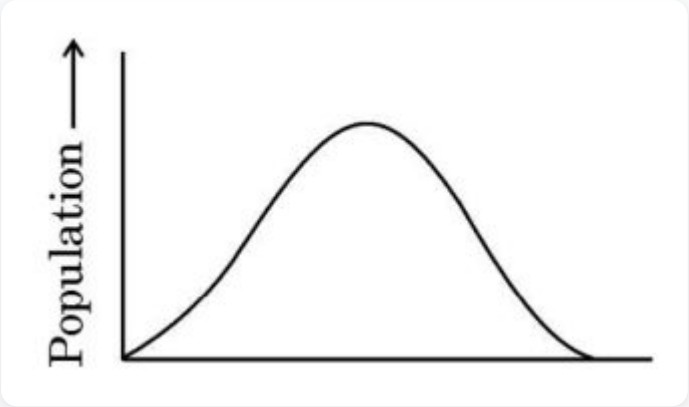
(D) Multicarpellary, Syncarpous

Question 10.

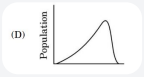
The given graph shows the range of variation among population members, for a trait determined by multiple genes. If this population is subjected to disruptive selection for several generations, which of

the following distributions is most likely to result?

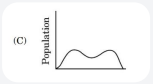
[1 Marks]



(A) A



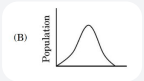
(B) B



(C) C



(D) D



Question 11.

Which one of the following immune system components does not correctly match with its respective role?

[1 Marks]

(A) Interferons Secreted by virus-infected cells and protect non-infected cells from further viral infection.

(B) Macrophages Mucus-secreting cells that trap microbes entering into the body.

(C) IgA Present in colostrum in early days of lactation to protect infants from diseases.

(D) B-Lymphocytes Produce antibodies in response to pathogens into blood to fight with them.

Question 12.

Which one of the following is not the product of transgenic experiments?

[1 Marks]

(A) Drought-resistant crops

(B) High nutritional value in grains

(C) Production of insulin by rDNA technique

(D) Pest-resistant crop variety

Question 13.

A biologist studied the population of rats in a granary. He found the average natality was 280, average mortality was 200, immigration was 40 and emigration was 50. The net increase in population is :

[1 Marks]

(A) 10

(B) 70

(C) 80

(D) 90

Question 14.

India has only 2.4% of the world's land area but its share of the global species diversity is :

[1 Marks]

(A) 5·1%

(B) 8·1%

(C) 7·3%

(D) 12·9%

Question 15.

Out of the following, select the correct match :

[1 Marks]

(A) Corn Borer Cry II Ab gene

(B) Transgenic cow milk Human beta-lactalbumin protein

(C) ELISA Antigen antibody interaction

(D) Cotton plant Meloidegyne Incognitia

Question 16.

Assertion (A) : Swiss cheese is characterized by large holes due to CO2 production. Reason (R) : It is ripened by growing a specific fungi.

[1 Marks]

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

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

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

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

Question 17.

Assertion (A) : Replication of DNA takes place in S phase of the cell cycle. Reason (R) : DNA replication and cell division cycle should be highly coordinated.

[1 Marks]

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

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

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

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

Question 18.

Assertion (A) : A male individual always inherits haemophilia from his mother. Reason (R) : The gene for haemophilia lies on X-chromosome.

[1 Marks]

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

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

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

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

Question 19.

Assertion (A) : A piece of DNA inserted into an alien organism generally does not replicate, if not inserted into a chromosome. Reason (R) :

[1 Marks]

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

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

(C) Assertion (A) is false, but Reason (R) is true.

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

Section C

Question 20.

Name the Indian crop variety for which, in 1997, an American company got patent rights through the US Patent and Trademark Office. This is considered a case of Biopiracy.Justify.

[2 Marks]

Question 21. State two purposes for which the Indian Government has set up GEAC (Genetic Engineering Approval Committee).

[2 Marks]

Question 22.

How does a human body respond when vaccine is introduced into it? It is said that vaccinations are a must for a healthy society. Justify.

[1 Marks]

Question 23. What are the two barriers in our body that protect it from such pathogens?

[1 Marks]

Question 24.

Give reasons for the following :

(i) Why can a woman generally not conceive a child after 50 years of age ?

(ii) Polar bodies are formed during oogenesis and not during spermatogenesis.

[2 Marks]

Question 25.

A few stages and their respective time period in the evolutionary history of human beings are mentioned in the flowchart given below :

Based on the above information, answer the following questions :

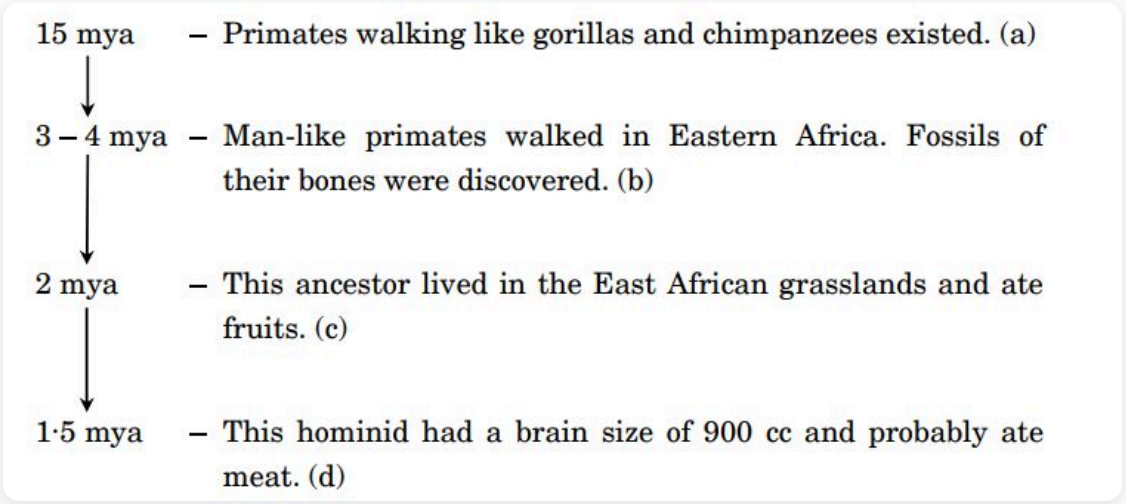
(a) Name one primate about 15 mya.

(b) Name one place where fossils of primates were discovered in Eastern Africa.

(c) Name the ancestor that lived in the East African grasslands about 2 mya.

(d) Name the hominid that was found around 1·5 mya

[2 Marks]



Question 26.

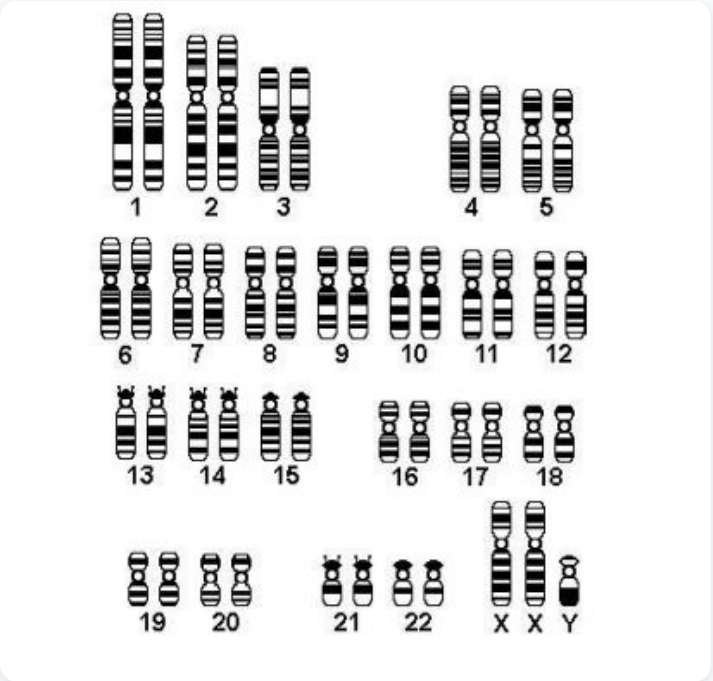
A karyotype of a human suffering from a certain disorder is given below :

(a) Identify the disorder.

(b) Write the symptoms of the disorder.

(c) Give reason for such a disorder.

[2 Marks]



Question 27.

"A fully developed foetus initiates its delivery from the mothers womb" Explain.

[2 Marks]

Section D

Question 28.

A village health worker was taking a session with women. She tells them that one has to be careful while using oral pills as a method of birth control. Wrong usage can actually promote conception.

(a) Analyse the above statement and compare the merits and demerits of using oral pills and surgical methods of birth control.

(b) Village women are confused as to how a thin metallic copper loop can provide protection against pregnancy. Explain the mode of action of IUDs. Give two points.

[3 Marks]

Question 29.

(a) " The process of evolution of different species in a given geographical area starts from a point and literally radiates to other

(b) Cite an example where more than one adaptive radiation has occurred in an isolated geographical area. Name the type of evolution your example depicts.

[3 Marks]

Question 30.

A segment of DNA, 'TTG AGG GGG ATG' was translated into an oligopeptide with the amino acids, Lysine Serine Proline Tyrosine.

(a) Write the codons in correct sequence for the four amino acids.

(b) If first adenine in DNA is substituted by guanine, what will be the sequence of amino acids in the new oligopeptide ?

(c) Write the anticodons for these amino acids.

[3 Marks]

Question 31.

A person is suffering from high grade fever. Which symptoms will help to identify if he/she is suffering from Typhoid, Pneumonia or Malaria ?

[3 Marks]

Question 32.

(a) Why are transgenic animals so called ?

(b) With the help of an example each, explain the role of transgenic animals in the following : (i) Vaccine safety (ii) Biological products

[3 Marks]

Question 33.

(a) Mention any two advantages of micropropagation techniques.

(b) Write in brief how the process is carried out in the laboratory.

(c) Name any two important food plants grown commercially by this method.

[3 Marks]

Question 34.

Name the type of food chains responsible for the flow of larger fraction of energy in an aquatic ecosystem and a terrestrial ecosystem, respectively. Mention any two differences between the two

food chains.

[3 Marks]

Section E

Question 35. Write the features a molecule should have to act as a genetic material. In the light of the above features, evaluate and justify the suitability of the molecule that is preferred as an ideal genetic material.

[5 Marks]

Question 36.

Study the given diagram showing the sectional view of a seminiferous tubule.

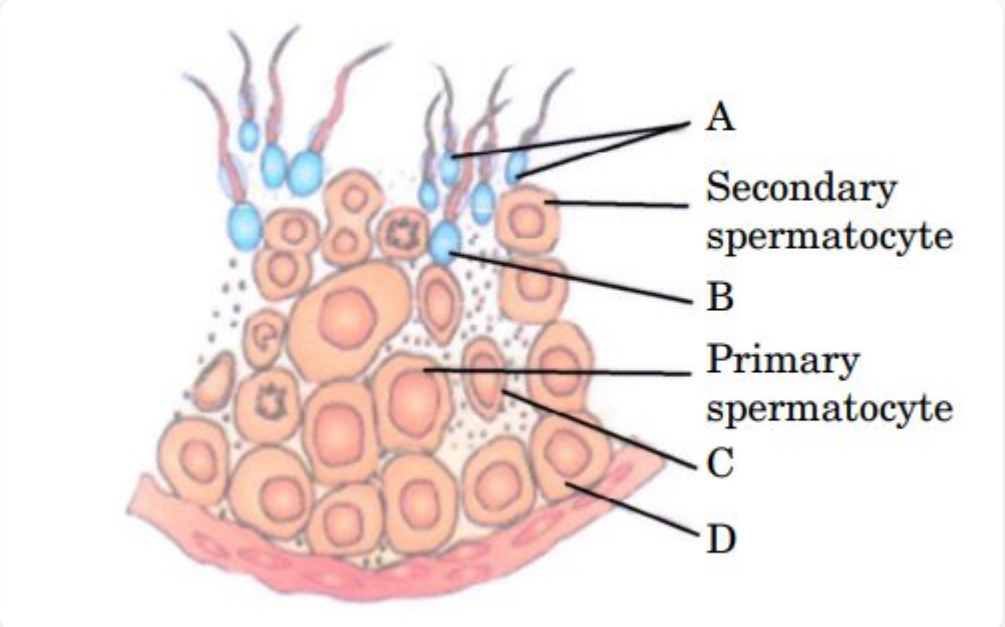
Answer the following questions:

(i) Label A, B, C and D in the figure.

(ii) What will be the number of chromosomes in secondary spermatocyte and spermatid respectively?

(iii) Explain the terms Spermiogenesis and Spermiation.

[5 Marks]



Question 37.

How does alien species invasion cause a decline in biodiversity? Explain. How have the following contributed to biodiversity loss?

I. Nile Perch

II. Lantana and Eichhornia

III. Clarias gariepinus

(ii) Why have certain regions been declared as biodiversity hotspots by environmentalists of the world ? Name any two such regions in India.

[5 Marks]

Question 38.

(b) Differentiate between the following :

(i) Polygenic Inheritance and Pleiotropy

(ii) Dominance, Codominance and Incomplete dominance

[5 Marks]

Question 39.

Study the figures given below showing initial stages in the formation of female gametophyte and answer the questions that follow.

(i) Identify (P) and (Q).

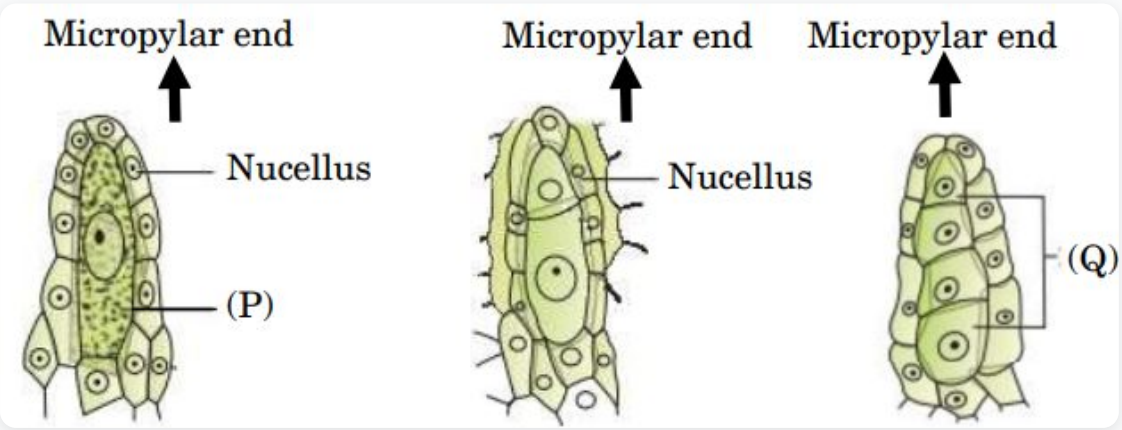
(ii) I. What kind of division does cell (P) undergo to form (Q) ?

II. How many (Q) cells form the embryo sac ? What is the name given to such kind of development ?

III. How many free nuclear mitotic divisions will the functional megaspore undergo to form the embryo sac ?

IV. Describe the structure of a mature female gametophyte.

[5 Marks]



Question 40.

(i) Write an equation for Verhulst-Pearl Logistic Growth Curve where : N = Population density at t r = Intrinsic rate of natural increase (ii) Draw a graph for a population whose population density has reached carrying capacity. (iii) Draw a growth curve where resources are non-limiting to growth of population. (iv) Which growth curve is considered more realistic and why ? Explain

[5 Marks]