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FOR PUNJAB CLASS 12 PREPARATION

PSEB 12th Sample Paper 2027 Biology

EXAM	YEAR	TYPE	SUBJECT
Punjab Class 12	2027	Sample Paper	Biology

SAMPLE PAPER, 2026-27

CLASS XII - BIOLOGY

Time allowed : 3 hrs. **Maximum Marks: 70**

INSTRUCTIONS:

1. All the questions are compulsory.
2. Question paper will consist of four sections A, B, C and D with total of 20 questions.
3. Section A will contain Question Number 1 having 18 sub-parts of 1 mark each, 16 questions will be of multiple choice question type and 2 will be assertion and reason questions.
4. Section B will contain question no. 2 to 12 total 11 very short answer type questions of 2 marks each.
5. Section C will contain question number 13 to 17 total 5 short answer type questions of 3 marks each.
6. Section D will consist of question 18 to 20 total 3 long answer type questions of 5 marks each. All the questions have 100% internal choice.

SECTION A

1. Each question carries one mark.

Multiple Choice Questions :

(i) Which of the following represent the female gametophyte in angiosperms ?

a) Embryo b) Embryo sac

c) Synergid d) Endosperm

(ii) In which part of sperm, mitochondria is present ?

a) Head b) Tail

c) Neck d) Middle Piece

(iii) Contraceptive oral pills helps in birth control by

a) Killing the sperms in uterus b) forming barriers between sperms and ova

c) preventing ovulation d) killing the ova

(iv) A plant breeder wants to perform artificial hybridization on a unisexual female flower of a crop species. Which of the following steps can be completely omitted from the protocol.

a) Bagging of female flower

b) Emasculation

c) Dusting of desired pollen grains

d) Re-bagging after pollination.

(v) XO type of sex determination is seen in

a) Man b) Grasshopper

c) Horses d) Drosophila

(vi) All of the following are part of an operon except
a) an operator b) structural gene
c) an enhancer d) a promoter

(vii) Analogous organs are a result of
a) Convergent evolution b) Shared ancestry
c) Stabilizing selection d) Divergent evolution

(viii) If DNA ligase is experimentally inhibited during DNA replication, what would be the most likely result ?
a) DNA unwinding will stop
b) RNA primers will not be formed
c) Okazaki fragments will remain unjoined
d) Nucleotides will not be added to the growing strand.

(ix) Widal test is used for diagnosis of
a) Malaria b) Cholera
c) Typhoid d) Yellow fever

(x) Methanogenic bacteria are not found in
a) rumen of cattle
b) Gobar gas plant
c) bottom of water logged paddy fields
d) activated sludge

(xi) Alcohol is the most socially accepted narcotic drug. Excessive consumption of alcohol leads to
a) State of hallucination b) Loss of memory
c) Suppression of brain d) Cirrhosis of liver

(xii) A patient infected with HIV shows a gradual decline in immunity over several years. The virus primarily affects.
a) B lymphocytes only b) Helpler T-lymphocytes
c) Red Blood cells d) Platelets

(xiii) Molecular scissors used in genetic engineering is
a) DNA ligase b) DNA polymerase
c) Helicase d) Restriction endonuclease

(xiv) A scientist wants to produce human insulin using genetically modified bacteria. Why is recombinant DNA technique useful in this process ?
a) Bacteria naturally produce human insulin
b) The human insulin gene can be introduced into bacteria for expression.
c) Bacteria convert antibodies into insulin.
d) Insulin is chemically synthesized by bacterial ribosomes without a gene.

(xv) The number of deaths in the population during a given period is referred to

a) Natality b) Mortality

c) Sex ratio d) None of the above

(xvi) In a food chain, producers contain 50,000 J of energy. If approximately 10% is transferred to each trophic level, how much energy would be available to secondary consumers ?

a) 5000 J b) 500 J

c) 50 J d) 5 J

Assertion and Reason Questions :

Directions : For each question, choose the correct option :

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

B. Both Assertion and Reason are true, and Reason is not the correct explanation of Assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but Reason is true.

(xvii) **Assertion :** Lactobacillus is used in the production of curd.

Reason : Lactobacillus converts milk sugar into lactic acid.

(xviii) **Assertion :** Bt toxin does not kill the bacterium Bacillus thuringiensis itself.

Reason : The toxin is produced as an inactive protoxin in the bacterium.

SECTION B

Each question carries 2 Marks.

2. What is apomixis ? What is its importance ?

OR

Differentiate between syngamy and double fertilization.

3. A woman with blood group O married a man with blood group AB. Show the possible blood groups of the progeny. List the alleles involved in the inheritance.

OR

Observe the following cross :

Tt X Tt

Gametes T, t X T, t

(a) Draw the Punnett square for this cross.

(b) State the genotypic Ratio.

4. Define homologous organs. Give one example of organ homologous to hand of man.

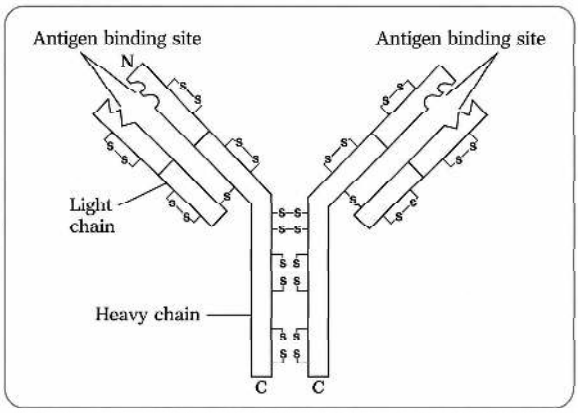
5. A gene undergoes a mutation that converts an amino acid codon into a stop codon. Predict its effects on the protein.

6. Name the causal agent of disease amoebiasis. Write its symptoms.

   OR

   Bottled fruit juices are clearer as compared to those at home. Explain.

7. Observe the diagram of an antibody molecule and answer.



   (a) Identify the labelled molecule.

   (b) Name the bonds that hold its polypeptide chains together.

8. During secondary sewage treatment, the BOD of sewage decreases considerably.

   (a) Why does BOD deceases ?

   (b) Which organisms are mainly responsible ?

9. What do you mean by palindromic nucleotide sequence ?

   OR

   What do you understand by biopiracy ?

10. During PCR, one of the three main steps is omitted. The amount of amplified DNA becomes neglegible. Analyse which step could be responsible and why ?

11. A population of bacteria doubles repeatedly under favourable conditions. Which type of growth curve would you expect and why ?

12. What do you mean by Rivet Popper Hypothesis ?

SECTION C

Each question carries 3 marks.

13. A student observes a pollen grain under a microscope and finds that it contains a vegetative cell and a generative cell.

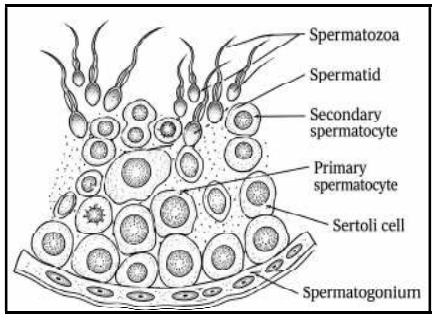
   (a) Which type of pollen grain is this ?

   (b) What will happen to the generative cell ?

   (c) State the function of the vegetative cell.

OR

Study the diagram of a seminiferous tubule



(a) Where are sertoli cells located ?

(b) What is the function of sertoli cells ?

(c) Where are Leydig cells located ?

14. A child has the Karyotype 47, XX + 21.

(a) Analyse the Karyotype and identify the disorder.

(b) What type of chromosomal abnormality is present ?

(c) How does this condition arise ?

OR

An mRNA codon changes from GAA to GAG, but the protein produced remains unchanged.

(a) What type of mutation may have occurred ?

(b) Which property of the genetic code explains this observation ?

(c) Why does the protein remain unchanged.

15. In the villages, malaria cases increase during the rainy season because stagnant water accumulates around houses.

(a) Identify the vector responsible for malaria transmission.

(b) Why does stagnant water increase malaria cases ? Explain.

(c) Suggest one effective preventive measure.

16. A plant is genetically modified to produce double stranded RNA corresponding to an essential gene of a nematode.

(a) Which biotechnology process is being used ?

(b) How does it affect the nematode ?

(c) How does this benefit the plant ?

17. A wild life population decreases sharply because individuals are continuously captured for commercial purposes.

(a) Which threat to biodiversity is illustrated ?

(b) Why can such exploitation lead to extinction ?

(c) Mention one measure to control it.

SECTION - D

Each question carries 5 marks.

18. Explain with the help of a diagram the development of a mature embryo sac from megaspore mother cell in angiosperm.

OR

Analyse why the placenta is considered an important endocrine tissue during pregnancy.

19. Explain the concept of adaptive radiation with a suitable example.

OR

A mutation changes a single nucleotide in the β-globin gene. This results in a change in one amino acid of the B-globin protein and alters the shape of red blood cells.

Analyse the information and answer.

(a) Name the disorder. (1)

(b) What type of mutation is involved. (1)

(c) Identify the amino acid substitution involved. (1)

(d) Explain how the mutation affects the red blood cells. (1)

(e) Why is this disorder considered a Mendelian disorder ? (1)

20. **Case Study**

A forest contains many species of plants, animals, fungi and microorganisms. The forest provides food, shelter and breeding places for these organisms. Some species are found only in this forest. Conservation authorities have declared the area a protected forest.

1. What is meant by biodiversity? (1)
2. What are species found only in a particular geographical area called? (1)
3. Name one benefit of conserving forests. (1)
4. A protected forest is an example of which type of conservation? (1)
5. Name one other protected area used for biodiversity conservation. (1)

OR

A parasite infects a host species and obtains nutrients from it, while the host becomes weak. Analyse the ecological interaction and its effect on the two population.

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