

SAMPLE QUESTION PAPER - 3

CLASS - 12

BIOLOGY

Maximum Marks : 70

Time Allowed : 3 hours

General Instructions : Same as in Sample Question Paper-1

SECTION - A

Q.1. Which of the following is not a characteristic of an ideal contraceptive ?

- (a) User-friendly
- (b) Irreversible
- (c) Easily available
- (d) Least side-effects

Q.2. A national level approach to build up a reproductively healthy society was taken up in our country in

- (a) 1950s
- (b) 1960s
- (c) 1980s
- (d) 1990s

Q.3. Match the following column - I with column - II.

Column I (Microbes)	Column II (Organic acid)
(A) <i>Aspergillus niger</i>	i. Butyric acid
(B) <i>Clostridium butylicum</i>	ii. Citric acid
(C) <i>Acetobacter aceti</i>	iii. Lactic acid
(D) <i>Lactobacillus</i>	iv. Acetic acid

- (a) A (i), B (ii), C (iii), D (iv)
- (b) A (ii), B (i), C (iv), D (iii)
- (c) A (ii), B (iv), C (iii), D (i)
- (d) A (iii), B (i), C (iv), D (ii)

Q.4. Which of the following includes all homologous organs ?

- (a) Wings of a butterfly, wings of a bird and the wings of a bat.
- (b) Forelimbs of a frog, wings of a bird and the forelimbs/hands of humans.
- (c) Hindlegs of a frog, forelimbs of a kangaroo and the hands of a man.
- (d) Wings of a cockroach, wings of a butterfly and the forelimbs of a rabbit.

Q.5. The substance produced by a cell in viral infection that can protect other cells from further infection is :

- (a) Serotonin
- (b) colostrum
- (c) interferon
- (d) histamine

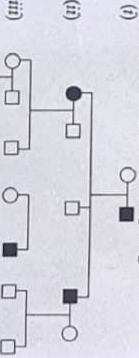
Q.6. Select the microbe which is the source of 'clot buster' enzyme.

- (a) Bacterium: *Lactobacillus*
- (b) Fungi: *Aspergillus niger*
- (c) Fungi: *Penicillium notatum*
- (d) Bacterium: *Streptococcus*

Q.7. Significance of 'heat shock' method in bacterial transformation is to facilitate

- (a) binding of DNA to the cell wall
- (b) uptake of DNA through membrane transport proteins
- (c) uptake of DNA through transient pores in the bacterial cell wall
- (d) expression of antibiotic resistance gene

Q.8. In the following human pedigree, the filled symbols represent the affected individuals, identify the type of given pedigree.

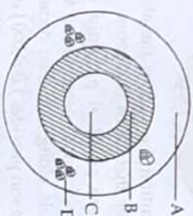


- (a) Autosomal recessive
- (b) X-linked dominant
- (c) Autosomal dominant
- (d) X-linked recessive

Q.9. Mycorrhiza is an example of :

- (a) decomposers
- (b) endoparasitism
- (c) symbiotic relationship
- (d) ectoparasitism

Q.10. The given diagram shows zonation in a biosphere reserve. After studying the same answer the following question.
What does C represent in the diagram ?

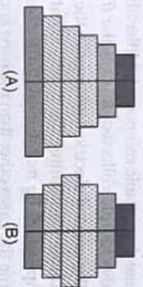


- (a) Area of human settlement
- (b) Area of resource utilization
- (c) Area undisturbed by human activity
- (d) Buffer zone

Q.11. Pick up the correct statement :

- (a) removal of 80% tigers resulted in greatly increased growth of vegetation
- (b) removal of most carnivores resulted in increased population of deer
- (iii) length of food chain is generally limited to 3-4 trophic levels due to energy loss
- (iv) length of food chain may vary.

Q.12. Identify the two age pyramids A and B shown below and select the correct option.



SECTION - B

Q.17. How is the use of 'microinjection' different from the method of 'biolistics' in biotechnology ? Explain.

Q.18. Complete the following table :

S.No.	Name of the disease	Causative organism	Symptoms
1.	Typhoid	a	Sustained high fever
2.	b	c	Difficulty in breathing
3.	Cold	d	Sore throat and cough

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(a) A - Expanding population

B - Stable population

(b) A - Stable population

B - Expanding population

(c) A - Stable population

B - Declining population

(d) A - Declining population

B - Stable population

Question No. 13 to 16 consist of two statements-Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below :

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true and R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

Q.13. Assertion : HLUW-486 wheat variety is self pollinated.

Reason : Pollen from a flower, lands on the stigma of the same flower is known as self pollination.

Q.14. Assertion : Substitution of Glutamine by Valine at the sixth position of the Beta globin chain of haemoglobin leads to sickle-cell anaemia in humans.

Reason : Deletions and insertions of base pairs in DNA cause frame-shift mutations.

Q.15. Assertion : Conjugation in bacteria is not considered sexual reproduction through there is transfer of genetic material in it.

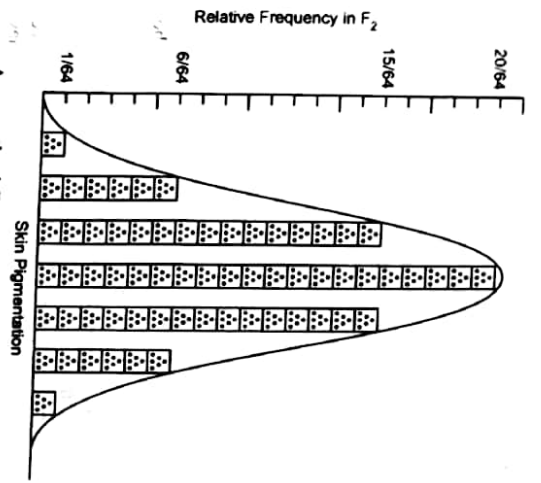
Reason : In conjugation, meiosis, gamete formation and genetic fusion do not occur.

Q.16. Assertion (A) : Species are the groups of potentially interbreeding natural populations that are isolated from other such groups.

Reason (R) : Reproductive isolation brings about distinctive morphological characters.

Q.19. The traits studied by Mendel showed two distinct alternate forms, called contrasting traits/characters. But, there are many heritable characters, which are not so distinct in their occurrence, but are spread across a gradient. Such traits are controlled by more than one gene are their inheritance is described as polygenic inheritance. When the relative frequency of the polygenic cross is plotted, a bell-shaped curve appears as given below :

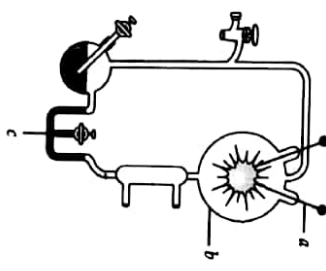
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- Answer the following questions :
- (a) Write any two characteristic features of polygenic inheritance.
- (b) Give two examples of human traits that show polygenic inheritance.

SECTION - C

Q.22. A diagrammatic representation of the experimental set up used by S.L. Miller is shown below. Answer the question that follow :



- (a) State the hypothesis which S.L. Miller tried to prove in the laboratory with the help of the set up shown above.

Q.20. (a) Name the human embryonic stage shown below. Identify (i) and (ii) in it.



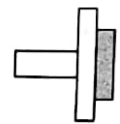
- (b) Mention the part of the above embryonic stage that forms the foetus.

Q.21. (a) Name an ideal pyramid existing in an ecosystem. Construct it up to three trophic levels, along with their names.

(b) The sun provides 1,000,000 J of sunlight (solar energy) in an ecosystem. Write the amount of energy that is available to the first and third trophic levels, respectively.

Or

Identify the type of given ecological pyramid and give one example each of pyramid of number and biomass in such cases.

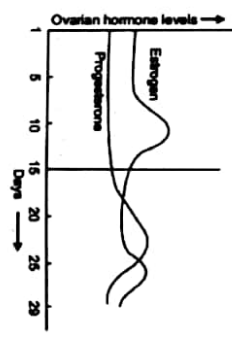


Name the scientist (s), who proposed that hypothesis.

- (b) Name the organic compound, Miller observed in the sample collected at 'c' in the figure.
- (c) Miller created electric discharge in the closed chamber containing the gases. What is the temperature he maintained in the chamber?
- (d) Name the gases other than methane and water vapour that Miller enclosed in the chamber.
- Q.23. (a) Cucurbits and Papaya plants bear staminate and pistillate flowers. Mention the categories they are put under separately on the basis of the type of flowers they bear.
- (b) Why is the offspring formed by asexual reproduction referred to as clone?
- Q.24. Following the collision of two trains a large number of passengers were killed. A majority of them were beyond recognition. Authorities want to hand over the dead bodies to their relatives.

Name a modern scientific method and write the procedure that would help in the identification of kinship.

- Q.25. (a) Read the given graph and correlate the uterine events that take place according to the hormonal levels on :
- (i) 6 - 15 days
- (ii) 16 - 25 days
- (iii) 26 - 28 days (if the ovum is not fertilised)



- (b) Specify the sources of the hormones mentioned in the graph.

SECTION - D

Question No. 29 and 30 are case-based questions. Each question has 3 subparts with internal choice in one subpart.

Q.29. It has been established that *Dryopithecus* is a common ancestor of man and apes. *Australopithecus* was discovered by Ramond Dart. *Homo habilis* was capable of making tools. *Homo erectus* includes java ape man, peking man and heidelberg man. Cro-magnon was the direct ancestor of the living modern man. *Ramapithecus* was discovered by Edward Lewis.

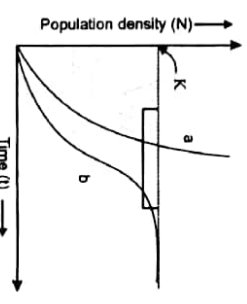
- (i) Who discovered the fossil of Neanderthal man first?
- (ii) Who was the common ancestor of man and apes?
- (iii) Who was *Homo erectus*? What was his characteristics?

Or

Write the characteristics of *Homo habilis*.

Q.30. Study the given graph and answer the questions that follows :

- (i) The curve 'b' is described by the following equation:
- $$\frac{dN}{dt} = rN \left\{ \frac{K-N}{K} \right\}$$



- (ii) Which one of the two curves is considered a more realistic one for most of the animal populations?
- (iii) Which curve would depict the population of a species of deer if there are no predators in the habitat? Why is it so?

Q.26. Unless the vector and source DNA are cut, fragments separated and joined, the desired recombinant vector molecule cannot be created.

- (a) How are the desirable DNA sequences cut?
- (b) Explain the technique used to separate the cut fragments.
- (c) How are the resultant fragments joined to the vector DNA molecule?
- Q.27. At what stage does *Plasmodium* gain entry into the human body? Write the different stages of its life cycle in the human body.

Or

A youth in his twenties met with an accident and succumbed to the injuries. His parents agreed to donate his organs.

1. List any two essential clinical steps to be undertaken before any organ transplant.

2. Why is the transplant rejected sometimes?

3. What views would you share with your help club members to promote organ donation?

Q.28. What are threatened species? Name their three types in order of the danger of extinction they face.

What does 'K' stand for in this equation?

Or

Mention the significance of K.

SECTION - E

Q.31. Nowadays gene therapy is an emerging technique used to treat genetic disorders that are caused by a non-functional gene. It works by delivering the 'missing' gene's DNA to the cells of the body. For instance, in the genetic disorder cystic fibrosis, people lack function of a gene for a chloride channel produced in the lungs. In a recent gene therapy clinical trial, a copy of the functional gene was inserted into a circular DNA molecule called a plasmid and delivered to patients' lung cells in spheres of membrane. In this example, biological components from different sources were combined to make a new product that helped preserve lung functional in cystic fibrosis patients.

Now answer the following questions :

- Is gene therapy better than bone marrow transplant ?
- What is gene therapy ?
- Who is the father of gene therapy ?
- What is the common form of gene therapy?

Or

Given below is a list of some of the important products of DNA recombinant technology. Write application of each of following.

Recombinant product	Applications
1. Human Insulin (Humulin)	
2. Human growth hormone	
3. Calcitonin	
4. Vaccines	
5. Interferons	

Q.32. A short stretch of DNA that codes for a polypeptide is give below :

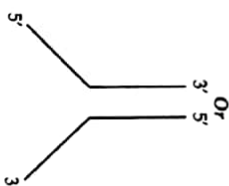
3'-CATCATGATGCAAAAC-5'

In the different cells of an organism, two different types of errors have occurred during replication of DNA and sequences of bases in the DNA in the two cells are given below :

Cell 1 : 3'-CATCATGATGATC-5'

Cell 2 : 3'-CATATGATGCAAAAC-5'

- What term is given to the stretch of DNA that codes for a polypeptide ?
- Write the type of mutation in (i) cell 1 and (ii) cell 2, respectively.
- Write the mRNA transcribed by the mutated DNA in cell 1.
- How many amino acids are coded by this mRNA ? Justify your answer.
- Write the mRNA transcribed by the mutated DNA in cell 2.



- Identify the structure shown above.
- Rewrite the structure as replication fork and label the parts.
- Write the source of energy for this replication and list the enzymes involved in this process.
- Mention the difference in the synthesis based on the polarity of two template strands.
- Briefly explain the events of fertilisation and implantation in an adult human female.
- Comment on the role of placenta as an endocrine gland.

Or

- Describe in sequence the process of microsporogenesis in angiosperms.
- Draw a labelled diagram of a mature dicot embryo.

SAMPLE QUESTION PAPER - 4

CLASS - 12

BIOLOGY

Maximum Marks : 70

Time Allowed : 3 hours

General Instructions : Same as in Sample Question Paper- 1

SECTION - A

- Which method can be used for women that cannot produce ovum but can provide suitable environment ?
(a) IUD (b) GIFT
(c) IUI (d) ICSI
- From the sexually transmitted diseases mentioned below, identify the one which does not specifically affect the sex organs.
(a) Syphilis (b) AIDS
(c) Gonorrhea (d) Genital warts
- Match the types of immunity listed in column I with the examples listed in column II. Choose the answer that gives the correct combination of alphabets of the two columns :

Column I	Column II
A. Natural active	(p) Immunity developed by heredity
B. Artificial passive	(q) From mother to foetus through placenta
C. Artificial active	(r) Injection of antiserum to travellers
D. Natural passive	(s) Fighting infections naturally induced by vaccination.
- A → p, B → q, C → r, D → t
 - A → s, B → r, C → t, D → q
 - A → s, B → t, C → q, D → r
 - A → t, B → s, C → r, D → p
- The RNA polymerase holoenzyme transcribes
(a) the promoter, structural gene and the terminator region.
(b) the promoter and the terminator region
(c) the structural gene and the terminator region
(d) the structural gene only
- The theory of evolution supported by the experiment conducted by Louis Pasteur, is
(a) Spontaneous generation theory
- Life comes only from pre-existing life
(c) Abiogenesis of life
(d) Big bang theory
- are used in detergent formulation and are helpful in removing oily stains from laundry.
(a) Ligases (b) Proteases
(c) Lipases (d) Pectinases
- The disease chikungunya is transmitted by
(a) houseflies (b) Aedes mosquitoes
(c) cockroach (d) female Anopheles
- Study the pedigree chart of a family showing the inheritance of myotonic dystrophy.
- The trait under study is
(a) dominant X-linked
(b) recessive X-linked
(c) autosomal dominant
(d) recessive Y-linked.
- While isolating DNA from bacteria, which of the following enzymes is not used ?
(a) Lysozyme
(b) Ribonuclease
(c) Deoxyribonuclease
(d) Protease
- Parasites that feed on the external surface of the host organism are called
(a) Ectoparasites
(b) Endoparasites
(c) Broodparasitism
(d) None of the above

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Note : Solution of this paper will be available on 15th November 2023.