

# **PRACTICE QUESTION PAPER-1**

# **SUBJECT: BIOLOGY**

## **SESSION (2022-23)**

## **Time Allowed : 3 hours**

**Maximum Marks : 70**

## **General Instructions :**

- All questions are compulsory.
  - The question paper has five sections and 33 questions. All questions are compulsory.
  - Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section–C has 7 questions of 3 marks each; Section–D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.
  - There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
  - Wherever necessary, neat and properly labeled diagrams should be drawn.

## **SECTION - A**

**Q.1** The chemical test that is used for diagnosis of typhoid is : [1]

- a. ELISA-Test
  - b. ESR-Test
  - c. PCR-Test
  - d. Widal-Test

**Q.2** Genetic engineering is - [1]

- a. Study of extra nuclear gene.
  - b. Manipulation of genes by artificial method
  - c. Manipulation of RNA
  - d. Manipulation of enzyme.

**Q.3** The options given below are representing parts of the sperm and its function. Match the Column A with Column B and choose the correct option. [1]

Column A		Column B	
a	Head	(i)	Enzymes
b	Middle piece	(ii)	Sperm motility
c	Acrosome	(iii)	Energy
d	Tail	(iv)	Genetic material

### Options :

- a. a - ii, b - iv, c - i, d - iii      b. a - iv, b - iii, c - i, d - ii  
c. a - iv, b - i, c - ii, d - iii      d. a - ii, b - i, c - iii, d - iv

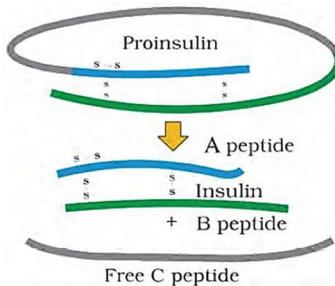
**Q.4** The correct order of step in polymerase chain reaction (PCR) is :

- a. Extension, Denaturation, Annealing
  - b. Denaturation, Annealing, Extension
  - c. Denaturation, Extension, Annealing
  - d. Annealing, Extension, Denaturation

**Q.5** Ecological niche is

- a. The Surface area of the ocean
- b. An ecologically adapted zone.
- c. Formed of all plants and animals living at the bottom of a lake.
- d. The physical position and functional role of a species within the community.

**Q.6** C - peptide of human insulin is :



**Q.7** Which of the following are the reason(s) for Rheumatoid arthritis ? Choose the correct option. [1]

- (i) Lymphocytes become more active.
  - (ii) Body attacks self-cells.
  - (iii) More antibodies are produced in the body.
  - (iv) The ability to differentiate pathogens or foreign molecules from self-cells is lost.
- a. (i) and (ii)
  - b. (ii) and (iv)
  - c. (iii) and (iv)
  - d. (i) and (iii)

**Q.8** A population has more young individuals compared to the older individuals. What would be the a status of the population after some years ? [1]

- a. It will decline
- b. It will stabilise
- c. It will increase
- d. It will first decline and then stabilise

**Q.9** Among the following, where do you think the process of decomposition would be the fastest ? [1]

- a. Tropical rain forest
- b. Antarctic
- c. Dry arid region
- d. Alpine region

**Q.10** In a DNA strand, the nucleotides are linked together by

- a. Glycosidic bonds
- b. Phosphodiester bonds
- c. Peptide bonds
- d. Hydrogen bonds

**Q.11** With regard to mature mRNA in eukaryotes :

- a. Exons and introns do not appear in the mature RNA.
- b. Exons appear, but introns do not appear in the mature RNA.
- c. Introns appear but exons do not appear in the mature RNA.
- d. Both exons and introns appear in the mature RNA.

**Q.12** From among the sets of terms given below, identify those that are associated with the gynoecium. [1]

- |  |                                     |
|--|-------------------------------------|
| a. Stigma, ovule, embryo sac, placenta | b. Thalamus, pistil, style, ovule   |
| c. Ovule, ovary, embryo sac, tapetum   | d. Ovule, stamen, ovary, embryo sac |

**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 (A) :** Urethra in human male act as a urinogenital canal.

**Reason (R) :** Urethra carries only urine while sperms are carried by vasa deferens only. [1]

**Q.14 Assertion (A) :** Flowers are site of sexual reproduction.

**Reason (R) :** Different type of embryological process occur inside the flower. [1]

**Q.15 Assertion (A) :** Chargaff's rule is applicable to RNA.

**Reason (R) :** RNA contains ribose sugar in them. [1]

**Q.16 Assertion (A) :** Haemophilia is an autosomal disorder.

**Reason (R) :** Haemophilic father can never pass the gene for haemophilia to his son. [1]

## SECTION – B

**Q.17** Explain the dual function of AUG. Give the sequence of bases it is transcribed from and its anticodon. [2]

**Q.18** Mention one application for each of the following : [2]

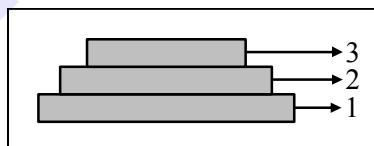
- (a) Passive immunisation
- (b) Antihistamine
- (c) Colostrum
- (d) Cytokinin-barrier

**Q.19** Discuss the role that enzyme DNA ligase plays during DNA replication. [2]

**Q.20** Explain the roles of the following with the help of an example each in recombinant DNA technology. [2]

- (a) Restriction enzymes
- (b) Plasmid

**Q.21** Study the given diagram and answers the questions that follow :



(a) Label the three tiers 1, 2, 3 given in the above age pyramid.

(b) What type of population growth is represented by the above age pyramid ? [2]

**OR**

What will happen to an ecosystem if :

- (a) All producers are removed.
- (b) All organisms of herbivore level are eliminated; and
- (c) All top carnivore population is removed.

## **SECTION – C**

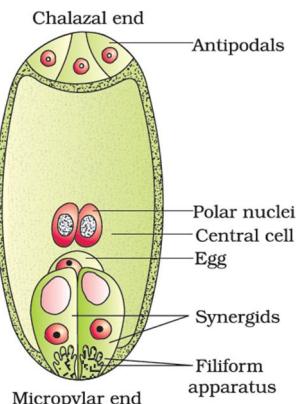
**Q.22(a)** What is genetic biodiversity?

- (b) Name and describe any three causes of biodiversity losses. [3]

**Q.23** Explain the functions of the following structures of the human sperm.



**Q.24** Study the given diagram of embryosac and answers the questions that follow:



- (a) From which end does the pollen grain enters into the embryosac?
  - (b) Which of the cells in the embryo sac will fertilise with male gamete to form zygote?

**Q.25(a)** Trace the development of an endosperm after fertilisation with reference to coconut. Mention the importance of endosperm development.

- (b) Write the importance of 'pollen bank'. [3]

**Q.26** Can a child have blood group O if his parents have blood group 'A' and 'B'. Explain.

OR

Differentiate between monohybrid & dihybrid cross. [3]

**Q.27(a)** Explain any two defence mechanisms plants have evolved against their predators.

- (b) How does predation differ from parasitism? [3]

**Q.28** Co-extinction and introduction of alien species too are responsible for the loss of biodiversity. Explain how? [3]

## SECTION - D

**O.29** Read the following passage and answer the questions given below :

AIDS is considered as a 'syndrome' rather as a disease. It is so because AIDS causing virus (HIV) enters the body of a healthy person generally through sexual organs or through blood transfusion. It damages body's Immune system and therefore, body no longer is able to fight off minor infections. Thus, there are no specific disease symptoms for AIDS and the patient develops complex diseases and symptoms.

- (a) What are the common symptoms of AIDS?  
(b) Mention two diseases that spread through sexual contact.  
(c) Name any three preventive measurer of AIDS disease.

OR

- (c) How AIDS can be diagnosed?

**Q.30 Read the following passage and answer the questions given below :**

RNA was the first genetic material. There is now enough evidence to suggest that essential life processes (such as metabolism, translation, splicing, etc.), evolved around RNA used to act as a genetic material as well as a catalyst (there are some important biochemical reactions in living systems that are catalyzed by RNA catalysts and not by protein enzymes). But RNA being a catalyst was reactive and hence unstable. Therefore, DNA has evolved from RNA with chemical modification that make it more stable. DNA being double stranded and having complementary strand further resists changes by evolving a process of repair.

- (a) Which nucleic acid is more reactive?  
(b) Which evidence suggest that RNA used to be the genetic material rather than DNA?  
(c) Write the criteria for being a genetic material for a molecules.

**[4]****OR**

- (c) "DNA has evolved from RNA with chemical modifications that make it more stable". Which chemical modification is referred here?

**SECTION – E****Q.31 Arrange the terms given below in their order of occurrence describing their structure and function in the early development of the human embryo: Implantation, cleavage, inner cell mass, trophoblast, blastomeres, endometrium, morula and blastocyst.** [5]**OR**

- (a) Geitonogamy and xenogamy, both require pollinating agents, yet they are very different from each other. Explain how?  
(b) Describe the characteristics of flowers that are pollinated by wind.

**Q.32 In malarial patient, the rupture of RBCs is associated with the release of toxic substance, haemozoin which is responsible for the chill and high fever recurring every three to four days.**  
(a) Give the scientific name of the parasite the causes malignant malaria in humans.  
(b) At what stage does the parasite enter in the human body?  
(c) Trace its life cycle in human body. [5]**OR**

Recombinant DNA technology is a technique that alters the phenotype of an entity (host) when a genetically modified vector is introduced and incorporated into the genome of the host. Thus, the process entails introducing a foreign fragment of DNA into the genome containing the desired gene. Unless the vector and source DNA are cut, fragments separated and joined, the desired recombinant vector molecule cannot be created.

- (a) How the desirable DNA sequence is cut?  
(b) Explain the technique used to separate the cut fragments.  
(c) How are the resultant fragments joined to the vector DNA molecule?

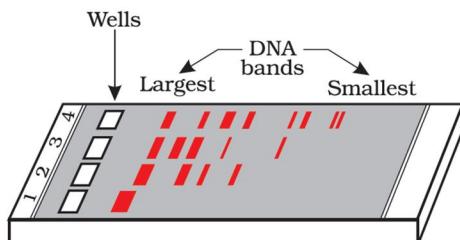
**Q.33** Differentiate between :

- (a) Plasmid DNA and Chromosomal DNA
- (b) RNA and DNA
- (c) Exonuclease and Endonuclease

[5]

**OR**

Given diagram shows the process of gel electrophoresis.



Gel electrophoresis is performed in a gel matrix so that molecules of similar electric charges can be separated on the basis of their size. Most commonly used matrix in gel electrophoresis is agarose. The separated DNA fragments can be seen only after staining the DNA with dye followed by exposure to UV radiation as bright orange band.

- (a) Agarose gel electrophoresis is employed to check the progression of which of the enzyme action?
- (b) The charge of DNA how can helpful for separation of DNA fragments into the gel.
- (c) What is the principle of gel electrophoresis?
- (d) Name the dye used for staining of the DNA for gel electrophoresis.
- (e) Why lane 1 has only one DNA bands as compare to 2, 3 & 4 lane in the given diagram?