

CLASS XII – BIOLOGY

SET – 5

Section – A (1×16 = 16 Marks)

Q1–12: MCQs

1. The pollen tube releases male gametes into:
 - A. Synergids
 - B. Antipodals
 - C. Central cell
 - D. Nucellus
2. The hormone that triggers parturition is:
 - A. Oxytocin
 - B. LH
 - C. FSH
 - D. Prolactin
3. DNA ligase is required during replication to:
 - A. Form RNA primer
 - B. Join Okazaki fragments
 - C. Unwind DNA
 - D. Remove introns
4. Which enzyme synthesizes RNA primer?
 - A. Primase
 - B. Helicase
 - C. Ligase
 - D. Polymerase III
5. A sudden drastic reduction in population size leads to:
 - A. Gene flow
 - B. Founder effect
 - C. Bottleneck effect
 - D. Adaptive radiation
6. Genetic code is universal because:
 - A. It has 64 codons
 - B. Same codon codes for same amino acid in most organisms

- C. It is continuous
- D. It is degenerate

7. If a heterozygous tall plant (Tt) is selfed, probability of dwarf offspring is:

- A. 0%
- B. 25%
- C. 50%
- D. 75%

8. Bt toxin in cotton is effective against:

- A. Bollworms
- B. Aphids
- C. Whiteflies
- D. Mosquitoes

9. ELISA test detects:

- A. DNA
- B. Antigen–antibody interaction
- C. RNA
- D. Enzyme activity only

10. Which ecosystem has highest gross primary productivity?

- A. Tropical rainforest
- B. Desert
- C. Tundra
- D. Temperate forest

11. Pyramid of energy is always upright because:

- A. Biomass increases upward
- B. Energy decreases at each trophic level
- C. Producers are smallest
- D. Consumers store more energy

12. The enzyme used in PCR is obtained from:

- A. E. coli
- B. Bacillus
- C. Thermus aquaticus
- D. Rhizobium

Q13–16: Assertion–Reason

13.

Assertion: Double fertilisation is unique to angiosperms.

Reason: It involves syngamy and triple fusion.

14.

Assertion: Vaccines provide artificial active immunity.

Reason: They stimulate antibody production and memory cells.

15.

Assertion: Primary succession takes longer than secondary succession.

Reason: Soil formation is required in primary succession.

16.

Assertion: RNAi technology is useful in pest control.

Reason: It blocks translation of specific mRNA.

(Options same as previous sets)

Section – B (2×5 = 10 Marks)

17. Attempt either A or B

A. Explain significance of double fertilisation.

OR

B. What are STDs? Mention any two and their prevention.

18. Explain lac operon in presence of lactose.

19. Define gene pool. How does migration affect gene frequency?

20. Attempt either A or B

A. What are restriction enzymes? Give one example.

OR

B. Explain role of selectable marker in cloning vector.

21. Attempt either A or B

A. Construct pyramid of energy if producers fix 50,000 kcal.

OR

B. Why are tropics more diverse? Give two ecological reasons.

Section – C (3×7 = 21 Marks)

22. Explain menstrual cycle with hormonal regulation.

23. Genetics Numerical

In pea plant, yellow seed (Y) dominant over green (y). Two heterozygous plants are crossed.

- (i) Phenotypic ratio
- (ii) Genotypic ratio
- (iii) Probability of green seed

24. Explain Darwin's theory of natural selection with example.

25. Describe steps involved in PCR. Mention its applications.

26. Explain eutrophication and biomagnification.

27. Differentiate between innate and acquired immunity.

28. Explain logistic population growth and carrying capacity with equation.

Section – D (4×2 = 8 Marks)

29. Case Study – Assisted Reproductive Technologies

A couple cannot conceive due to blocked fallopian tubes.

- A. Name suitable ART technique.
- B. Explain procedure briefly.
- C. What is ZIFT?
- D. Mention one limitation of ART.

30. Case Study – Genetic Engineering

A gene for insulin is inserted into plasmid and introduced into bacteria.

- A. What is recombinant DNA?
- B. Which enzyme joins gene and plasmid?
- C. What is role of ori?
- D. How is insulin produced commercially?

Section – E (5×3 = 15 Marks)

31.

- A. Explain DNA replication with diagram.
- B. Mention enzymes involved.

OR

Explain transcription and post-transcriptional modifications in eukaryotes.

32.

- A. Explain Agrobacterium-mediated transformation.
- B. What is Bt cotton?
- C. How does Cry toxin work?

OR

Explain gel electrophoresis and its principle.

33.

Justify the following:

- A. Competitive exclusion principle
- B. Resource partitioning
- C. 10% Law
- D. Keystone species
- E. Latitudinal gradient of biodiversity

OR

Explain ecological pyramids and limitations.