CLASS XII – BIOLOGY
SET – 2

Section – A (1×16 = 16 Marks)

Q1–12: MCQs

1. The functional megaspore in angiosperms develops from:
A. Chalazal megaspore
B. Micropylar megaspore
C. Central megaspore
D. Any of the four megaspores

2. During menstrual cycle, LH surge induces:
A. Follicular growth
B. Ovulation
C. Menstruation
D. Formation of corpus albicans

3. Okazaki fragments are formed during:
A. Leading strand synthesis
B. Lagging strand synthesis
C. Transcription
D. Translation

4. The enzyme responsible for joining DNA fragments is:
A. DNA polymerase
B. Restriction endonuclease
C. DNA ligase
D. Primase

5. Which of the following is an example of homologous organs?
A. Wings of butterfly and bat
B. Flippers of whale and forelimbs of horse
C. Eyes of octopus and human
D. Thorn of Bougainvillea and tendril of Cucurbita

6. Gene flow results in:
A. Increased isolation
B. Reduced genetic variation
C. Transfer of alleles between populations
D. Formation of new species immediately

7. If a woman is carrier for haemophilia and marries a normal man, probability of haemophilic son is:
A. 0%
B. 25%
C. 50%
D. 75%

8. Cry proteins used in Bt crops are derived from:
A. Bacillus thuringiensis
B. Rhizobium
C. Agrobacterium
D. E. coli

9. Wuchereria bancrofti infects:
A. RBCs
B. Liver cells
C. Lymph vessels
D. Intestinal epithelium

10. Reverse transcription is catalysed by:
A. RNA polymerase
B. DNA polymerase
C. Reverse transcriptase
D. Ligase

11. Maximum primary productivity is found in:
A. Desert
B. Open ocean
C. Tropical rainforest
D. Tundra

12. Amensalism is interaction where:
A. Both species benefit
B. One benefits, other unaffected
C. One harmed, other unaffected
D. Both harmed

Q13–16: Assertion & Reason

A. Both A and R are true and R correct explanation
B. Both A and R true but R not explanation
C. A true, R false
D. A false, R true

13.
Assertion: Crossing over leads to genetic recombination.
Reason: Exchange of genetic material occurs between homologous chromosomes.

14.
Assertion: Antigen-antibody reaction is highly specific.
Reason: Antibodies have variable regions.

15.
Assertion: Secondary succession is faster than primary succession.
Reason: Soil is already present.

16.
Assertion: Transgenic animals are used to study gene expression.
Reason: They carry foreign genes inserted artificially.

Section – B (2×5 = 10 Marks)

17. Attempt either A or B

A. Explain double fertilisation in angiosperms.
OR
B. Differentiate between IUDs and oral contraceptive pills (any two points).

18. Describe role of sigma factor in transcription.

19. What is genetic drift? Explain bottleneck effect.

20. Attempt either A or B

A. Why is PCR called gene amplification technique?
OR
B. Explain selectable marker with example.

21. Attempt either A or B

A. Explain inverted pyramid of biomass in aquatic ecosystem.
OR
B. Define ecological succession. Differentiate primary and secondary succession.

Section – C (3×7 = 21 Marks)

22. Describe spermatogenesis with labelled diagram.

23. In snapdragon, red (RR) × white (rr) shows incomplete dominance.
(i) Give F1 phenotype.
(ii) Find F2 phenotypic ratio.
(iii) State genotypic ratio.

24. Explain adaptive radiation with example.

25. Describe steps involved in formation of recombinant DNA.

26. What is BOD? How does high BOD affect aquatic life?

27. Explain humoral and cell-mediated immunity.

28. Derive logistic growth equation and explain carrying capacity.

Section – D (4×2 = 8 Marks)

29. Case Study – Genetic Disorder

A couple has first child suffering from sickle-cell anaemia.

A. Type of inheritance?
B. Genotype of parents?
C. Probability of next child being normal?
D. Why is disease more common in malaria-prone areas?

30. Case Study – Population Pyramid

A country shows urn-shaped population pyramid.

A. What does this indicate about growth?
B. Birth and death rate status?
C. Economic impact?
D. Suggest one corrective measure.

Section – E (5×3 = 15 Marks)

31.

A. Explain DNA replication in prokaryotes.
B. Why is lagging strand synthesized discontinuously?

OR

Explain structure of tRNA and its role in translation.

32.

A. Explain role of Ti plasmid in gene transfer.
B. What are restriction enzymes?
C. How does RNA interference (RNAi) help in pest control?

OR

Explain gel electrophoresis and its principle.

33.

Justify with examples:

A. Gause's Competitive Exclusion Principle
B. Resource partitioning
C. Keystone species
D. 10% law
E. Ecological pyramids are always upright for energy

OR

Explain latitudinal gradient of biodiversity with ecological reasons.