

Class XII Zoology - Quarterly Examination Answer Key

Tamil Nadu State Board syllabus Common Quarterly Examination 2025
(Kanchipuram)

Part I - Multiple Choice

1. **c) Sexual reproduction**
2. **a)** Both A and R are true; R correctly explains A.
3. **A-iv, B-i, C-ii, D-iii.** Copper IUD - Multiload 375; hormone IUD - LNG-20; non-medicated IUD - Lippes Loop; mini-pill - Saheli.
4. **c) Francis Galton**
5. **b)** Monozygotic twin pedigree symbol.
6. **b) Transcription**
7. **d)** Semi-conservative nature of DNA replication.
8. **a) Mesozoic era**
9. **b) Lamarck**
10. **a)** Amphetamines - stimulant.
11. **d) Liver**
12. **a) IgE**
13. **c) Plasma cells**
14. **d) Trichoderma polysporum**
15. **c) Molasses**

Correction for Q3: the correct matching is not present among the four printed alternatives. Use **A-iv, B-i, C-ii, D-iii.**

Part II - Short Answers

16. Development of an unfertilised egg into an individual; examples: honey bee and rotifer (also seen in some lizards).
17. **Spermatogenesis:** formation of sperm from spermatogonia, involving multiplication, growth and meiosis. **Spermiogenesis:** transformation of haploid spermatids into spermatozoa; no cell division.
18. Genes located on the Y chromosome; inherited from father to son only.

19. DNA → RNA → Protein (with DNA replication: DNA → DNA).
20. **Template/antisense strand:** 3'→5', read by RNA polymerase; mRNA is complementary to it. **Coding/sense strand:** 5'→3'; its sequence matches mRNA except T replaces U.
21. Fossilised faecal matter of extinct animals.
22. Histamine, kinins, prostaglandins and leukotrienes.
23. Zymology is the study of fermentation and its practical applications.
24. Screen serum for anti-HIV antibodies by ELISA; confirm a positive result by Western blot (PCR may detect viral nucleic acid).

Part III - Brief Points

25. Placenta acts as an endocrine tissue by secreting hCG, hPL, oestrogens, progesterone and relaxin, which maintain pregnancy and support foetal growth.
26. **Trichomoniasis:** causative agent *Trichomonas vaginalis*; symptoms include frothy vaginal discharge, itching/burning and dysuria (males may have urethritis).
27. **Karyotyping:** arranging chromosomes in homologous pairs by size, centromere position and banding pattern. It detects chromosomal abnormalities and is used in prenatal diagnosis/sex-chromosome analysis.
28. Human Genome Project goals: identify all human genes; sequence about 3 billion base pairs; store data and develop analysis tools; address ethical, legal and social issues.
29. **Divergent evolution:** related organisms develop different functions from a common ancestor; homologous organs. **Convergent evolution:** unrelated organisms independently develop similar functions; analogous organs.
30. August Weismann disproved inheritance of acquired characters by cutting the tails of mice for many generations; all offspring still had normal tails.
31. i) *Wuchereria bancrofti*. ii) Lymph-vessel obstruction causes oedema/elephantiasis, especially of legs and genital organs. iii) Transmitted by the bite of infected female *Culex* mosquito.
32. *Lactobacillus* converts lactose into lactic acid; the fall in pH coagulates casein, converting milk to curd.
33. **Lymph-node sketch - labels:** capsule, afferent lymphatic vessels, cortex with lymph follicles/germinal centres, medulla (medullary cords and sinuses), hilum, efferent lymphatic vessel, artery and vein.

Part IV - Five-Mark Answer Outline

34. a) **Human ovum:** secondary oocyte with haploid nucleus, ooplasm, oolemma, perivitelline space, zona pellucida and corona radiata; include polar body in the labelled diagram.

OR

b) Menstrual cycle: menstrual phase (days 1-5; shedding of endometrium); follicular/proliferative phase (FSH and oestrogen); ovulation around day 14 (LH surge); luteal/secretory phase (corpus luteum and progesterone). Hormone fall causes menstruation if fertilisation does not occur.

35. **a) Permanent contraception:** surgical sterilisation. Vasectomy: a small portion of each vas deferens is cut and tied. Tubectomy: a portion of each fallopian tube is cut and tied; prevents gamete transport/fertilisation.

OR

b) Types of syngamy: autogamy (gametes from same organism); exogamy (different parents); hologamy (whole mature organisms fuse); paedogamy (young individuals fuse); merogamy (gametic fusion after fragmentation); isogamy (similar gametes); anisogamy (dissimilar gametes).

36. **a) Human sex determination:** female 44+XX is homogametic and produces X ova; male 44+XY is heterogametic and produces X or Y sperm. X sperm + X ovum = XX female; Y sperm + X ovum = XY male. Thus sperm determines sex.

OR

b) Genetic code: triplet; 64 codons; unambiguous; degenerate; nearly universal; non-overlapping and comma-less. AUG is the start codon; UAA, UAG and UGA are stop codons.

37. **a) Urey-Miller experiment:** a closed apparatus containing CH₄, NH₃, H₂ and water vapour simulated the primitive atmosphere. Electrical discharges simulated lightning; cooling condensed the products. Amino acids and other organic molecules formed, supporting chemical evolution.

OR

b) Immunoglobulin: Y-shaped molecule of two identical heavy and two identical light polypeptide chains, linked by disulphide bonds. Variable regions form two antigen-binding Fab arms; constant heavy-chain region forms Fc; hinge provides flexibility.

38. **a) Prevention/control of drug and alcohol abuse:** education and refusal skills; avoid peer pressure; healthy stress management; family/community support; early identification and counselling; medical de-addiction, rehabilitation and follow-up support.

OR

b) Active vs passive immunity: active immunity follows infection/vaccination, produces memory and is slow but long-lasting; passive immunity transfers ready-made antibodies, acts immediately, has no memory and is short-lived (e.g., maternal antibodies/antiserum).