Tamil Nadu 2026 Class 12 Zoology(Set A) Question Paper with Solutions

Time Allowed :3 Hour	Maximum Marks :70	Total Questions :21

General Instructions

- The total duration of the examination is 3 hours (180 minutes).
- Candidates are allotted 15 minutes for reading the question paper and verifying their particulars.
- The maximum marks for the theory paper is 70.
- Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
- Use Blue or Black ink to write and underline, and use a pencil for drawing diagrams.
- The question paper consists of four parts (Part I, II, III, and IV).
- Part I is compulsory and contains multiple-choice questions.
- Internal choices and "answer any x out of y" options are provided in Parts II, III, and IV.
- Diagrams should be drawn wherever necessary and labeled neatly.
- Scientific calculators and other electronic gadgets are strictly not allowed.

1. This pedigree symbol represents:

(A) Male
(B) Monozygotic twins
(C) Mating
(D) Dizygotic twins

Correct Answer: (2) Monozygotic twins

Solution:
Concept: Pedigree symbols are used in genetics to represent family relationships and inheritance patterns.
Step 1: Understanding the diagram.
The figure shows two offspring arising from a single point and connected by a horizontal line at the top.

Step 2: Interpretation.
This indicates that the twins originate from the same zygote and are therefore genetically identical.
Step 3: Identification.
Such a symbol represents monozygotic (identical) twins.
Step 4: Evaluating the options.

- Male → Represented by a square (incorrect)
- Monozygotic twins → Identical twins with connecting line (correct)
- Mating → Horizontal line between two individuals (incorrect)
- Dizygotic twins → No connecting line (incorrect)

Step 5: Conclusion.
Thus, the given pedigree symbol represents monozygotic twins.

Quick Tip

Remember: Twins + connecting line = Monozygotic (identical).

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2. Select the incorrect action of hormonal contraceptive pills from the following:
(A) Changes in cervical mucus impairing its ability to allow passage and transport of sperms
(B) Inhibition of spermatogenesis
(C) Alteration in uterine endometrium to make it unsuitable for implantation
(D) Inhibition of ovulation

Correct Answer: (2) Inhibition of spermatogenesis

Solution:
Concept: Hormonal contraceptive pills (mainly estrogen and progesterone combinations) act on the female reproductive system to prevent pregnancy.
Step 1: Actions of contraceptive pills.

- Inhibit ovulation by suppressing FSH and LH
- Thicken cervical mucus, preventing sperm entry
- Alter endometrium, making it unsuitable for implantation

Step 2: Evaluate each option.

- Changes in cervical mucus → Correct action
- Inhibition of spermatogenesis → Occurs in males, not by female contraceptive pills (incorrect)
- Alteration in uterine endometrium → Correct action

- Inhibition of ovulation → Primary action (correct)

Step 3: Conclusion.
Thus, inhibition of spermatogenesis is not an action of hormonal contraceptive pills.

Quick Tip

Remember: Pills act on ovulation, uterus, and cervical mucus — not on sperm production.

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3. Statement I: Castration (or) surgical removal of testis is known as Orchidectomy.
Statement II: It leads to difficulty in urination.
(A) Statement I and Statement II are not correct.
(B) Statement I and II are correct.
(C) Statement I is not correct and Statement II is correct.
(D) Statement I is correct and Statement II is not correct.

Correct Answer: (4) Statement I is correct and Statement II is not correct.

Solution:
Concept: Orchidectomy refers to the surgical removal of one or both testes, commonly performed for medical conditions such as testicular cancer or as part of castration.
Step 1: Evaluate Statement I.
Castration or removal of testes is indeed called orchidectomy. Hence, Statement I is correct.
Step 2: Evaluate Statement II.
Orchidectomy primarily affects hormone production (testosterone) and fertility. It does not directly affect urination, as the urinary system is separate from the testes.
Step 3: Conclusion.
Statement I is correct, but Statement II is incorrect.

Quick Tip

Remember: Testes → Reproduction & hormones, not urination.

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4. _____ is/are an ideal disinfectant for waste water.
(A) Boiling
(B) U-V Rays
(C) Ozonisation
(D) Chlorination

Correct Answer: (4) Chlorination

Solution:
Concept: Disinfection of wastewater involves killing harmful microorganisms before releasing water into the environment.

Step 1: Understanding ideal disinfectant.
An ideal disinfectant should be effective, economical, easy to apply, and capable of destroying pathogens.
Step 2: Evaluate the options.

- Boiling → Effective but not practical for large-scale wastewater treatment (incorrect)
- U-V Rays → Used but less effective in turbid water (incorrect)
- Ozonisation → Effective but expensive (incorrect)
- Chlorination → Widely used, economical, and effective (correct)

Step 3: Conclusion.
Thus, chlorination is considered the ideal disinfectant for wastewater treatment.

Quick Tip

Remember: Wastewater treatment → Chlorination (most common and economical).

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5. Assertion (A): In nature many organisms produce clones through asexual reproduction.
Reason (R): By this process, genetically identical individuals are produced.
(A) Both Assertion and Reason are false.
(B) Assertion is true, but Reason is false.
(C) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(D) Both Assertion and Reason are true and Reason explains Assertion correctly.

Correct Answer: (4) Both Assertion and Reason are true and Reason explains Assertion correctly.

Solution:
Concept: Asexual reproduction produces offspring from a single parent without the involvement of gametes, resulting in genetically identical individuals called clones.
Step 1: Evaluate Assertion.
Many organisms (such as bacteria, fungi, and some plants) reproduce asexually and produce clones. Hence, Assertion is true.
Step 2: Evaluate Reason.
Asexual reproduction involves mitotic division, producing offspring that are genetically identical to the parent. Hence, Reason is true.
Step 3: Link between Assertion and Reason.
The reason correctly explains why asexual reproduction results in clones.
Step 4: Conclusion.
Both Assertion and Reason are true, and the Reason correctly explains the Assertion.

Quick Tip

Remember: Asexual reproduction → No variation → Clones.

6. The relationship between sucker fish and shark is _____.
(A) Predation
(B) Competition
(C) Parasitism
(D) Commensalism

Correct Answer: (4) Commensalism

Solution:
Concept: Commensalism is a type of interaction where one organism benefits while the other is neither harmed nor benefited.
Step 1: Understanding the relationship.
The sucker fish (remora) attaches itself to the shark using a sucker-like organ.
Step 2: Benefit to sucker fish.

- Gets free transport
- Feeds on food scraps left by the shark

Step 3: Effect on shark.
The shark is neither harmed nor significantly benefited.
Step 4: Evaluating the options.

- Predation → One kills another (incorrect)
- Competition → Both compete (incorrect)
- Parasitism → One harmed (incorrect)
- Commensalism → One benefits, other unaffected (correct)

Step 5: Conclusion.
Thus, the relationship is commensalism.

Quick Tip

Remember: Remora + Shark → One benefits, other unaffected = Commensalism.

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7. Allergy involves:
(A) IgA
(B) IgE
(C) IgM
(D) IgG

Correct Answer: (2) IgE

Solution:
Concept: Allergy is a hypersensitive immune response to harmless substances (allergens), mediated mainly by Immunoglobulin E (IgE).
Step 1: Role of IgE.
IgE antibodies bind to allergens and trigger the release of histamine and other chemicals from mast cells and basophils.
Step 2: Result of IgE action.
This leads to symptoms such as sneezing, itching, swelling, and inflammation.
Step 3: Evaluating the options.

- IgA → Mucosal immunity (incorrect)
- IgE → Allergy and hypersensitivity (correct)
- IgM → First antibody in primary response (incorrect)
- IgG → Long-term immunity (incorrect)

Step 4: Conclusion.
Thus, allergy involves IgE.

Quick Tip

Remember: Allergy → IgE → Histamine release.

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8. The wings of birds and butterflies is an example of:
(A) Divergent evolution
(B) Adaptive radiation
(C) Variation
(D) Convergent evolution

Correct Answer: (4) Convergent evolution

Solution:
Concept: Convergent evolution occurs when unrelated organisms independently evolve similar structures or functions due to similar environmental pressures.
Step 1: Understanding the structures.
Wings of birds and butterflies serve the same function (flight) but have different structural origins.
Step 2: Nature of organs.
These are analogous organs — same function but different origin.
Step 3: Interpretation.
Such similarities arise due to convergent evolution.
Step 4: Evaluating the options.

- Divergent evolution → Same origin, different function (incorrect)

- Adaptive radiation → Evolution from common ancestor (incorrect)
- Variation → General differences (incorrect)
- Convergent evolution → Same function, different origin (correct)

Step 5: Conclusion.
Thus, wings of birds and butterflies are an example of convergent evolution.

Quick Tip

Remember: Analogous organs → Convergent evolution.

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9. The most common substrate used in distilleries for the production of ethanol is _____.
(A) Molasses
(B) Soya meal
(C) Corn meal
(D) Groundgram

Correct Answer: (1) Molasses

Solution:
Concept: Ethanol is produced by fermentation of sugars using microorganisms like yeast.
Step 1: Understanding substrate requirement.
Fermentation requires a sugar-rich substrate.
Step 2: Role of molasses.
Molasses, a by-product of sugar industry, is rich in sucrose and is widely used for ethanol production.
Step 3: Evaluate options.

- Molasses → Rich in sugars, commonly used (correct)
- Soya meal → Protein-rich, not suitable (incorrect)
- Corn meal → Used in some countries, but not most common (incorrect)
- Groundgram → Not used (incorrect)

Step 4: Conclusion.
Thus, molasses is the most common substrate used for ethanol production.

Quick Tip

Remember: Ethanol fermentation → Sugar source → Molasses.

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10. The term "Niche" was first used by _____.

(A) John Ray
(B) Charles Darwin
(C) Jordon
(D) Charles Elton

Correct Answer: (4) Charles Elton

Solution:
Concept: An ecological niche refers to the functional role and position of a species within its ecosystem.
Step 1: Origin of the term.
The term "niche" in ecology was first introduced by Charles Elton in 1927.
Step 2: Meaning of niche.
It includes how an organism interacts with biotic and abiotic factors, including its habitat, food, and role.
Step 3: Evaluating the options.

- John Ray → Early taxonomist (incorrect)
- Charles Darwin → Evolution theory (incorrect)
- Jordon → Not associated (incorrect)
- Charles Elton → Introduced niche concept (correct)

Step 4: Conclusion.
Thus, the term "niche" was first used by Charles Elton.

Quick Tip

Remember: Ecological niche → Charles Elton (1927).

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11. Hershey and Chase's experiment with bacteriophage showed that:
(A) DNA contains radioactive sulphur.
(B) Protein gets into the bacterial cells.
(C) Viruses undergo transformation.
(D) DNA is the genetic material.

Correct Answer: (4) DNA is the genetic material.

Solution:
Concept: Hershey and Chase (1952) used bacteriophages to determine whether DNA or protein is the genetic material.
Step 1: Experimental setup.

- DNA was labeled with radioactive phosphorus (^{32}P)
- Protein was labeled with radioactive sulphur (^{35}S)

Step 2: Infection of bacteria.
Bacteriophages were allowed to infect bacterial cells.
Step 3: Observation.
Only radioactive phosphorus (DNA) entered the bacterial cells, while protein remained outside.
Step 4: Inference.
Since DNA entered the cell and directed viral replication, it must be the genetic material.
Step 5: Evaluating options.

- DNA contains radioactive sulphur → Incorrect (protein contains sulphur)
- Protein gets into bacterial cells → Incorrect
- Viruses undergo transformation → Incorrect
- DNA is the genetic material → Correct

Step 6: Conclusion.
Thus, the experiment proved that DNA is the genetic material.

Quick Tip

Remember: $^{32}P \rightarrow$ DNA enters cell → DNA = genetic material.

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12. Which of the following groups of diseases have been controlled by the use of vaccines and by creating awareness among the people?
(A) Small pox, amoebiasis, diphtheria, tetanus.
(B) Small pox, polio, diphtheria, tetanus.
(C) Small pox, AIDS, diphtheria, tetanus.
(D) Small pox, common cold, diphtheria, tetanus.

Correct Answer: (2) Small pox, polio, diphtheria, tetanus.

Solution:
Concept: Vaccination and public awareness programs have been highly effective in controlling certain infectious diseases.
Step 1: Diseases controlled by vaccines.

- Smallpox → Eradicated globally through vaccination
- Polio → Controlled through mass immunization programs
- Diphtheria and Tetanus → Controlled through routine vaccination

Step 2: Evaluate other options.

- Amoebiasis → Not controlled by vaccines (incorrect)
- AIDS → No effective vaccine available (incorrect)

- Common cold → No vaccine due to many viral strains (incorrect)

Step 3: Conclusion.
Thus, the correct group is smallpox, polio, diphtheria, and tetanus.

Quick Tip

Remember: Vaccine success → Smallpox, Polio, DPT diseases.

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13. In which type of Parthenogenesis are only males produced?
(A) Arrhenotoky
(B) Thelytoky
(C) Amphitoky
(D) Both (a) and (c)

Correct Answer: (1) Arrhenotoky

Solution:
Concept: Parthenogenesis is a form of reproduction in which an organism develops from an unfertilized egg.
Step 1: Types of parthenogenesis.

- **Arrhenotoky** → Only males are produced (e.g., honeybees)
- **Thelytoky** → Only females are produced
- **Amphitoky (Deuterotoky)** → Both males and females are produced

Step 2: Evaluate options.

- Arrhenotoky → Produces males (correct)
- Thelytoky → Produces females (incorrect)
- Amphitoky → Produces both sexes (incorrect)
- Both (a) and (c) → Incorrect

Step 3: Conclusion.
Thus, arrhenotoky is the type of parthenogenesis that produces only males.

Quick Tip

Remember: Arrhenotoky → Males, Thelytoky → Females.

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14. Find out the wrongly matched pair.

(A) Y-chromosome - 231 genes
(B) Chromosome-1 - 2968 genes
(C) Dystrophin - 2.4 million bases
(D) Human genome - 300 bases

Correct Answer: (4) Human genome - 300 bases

Solution:
Concept: The human genome consists of a very large number of base pairs and genes distributed across chromosomes.
Step 1: Evaluate each pair.

- Y-chromosome → About 200–300 genes (correct)
- Chromosome-1 → Largest chromosome with ∼2968 genes (correct)
- Dystrophin → One of the largest genes (∼2.4 million base pairs) (correct)
- Human genome → Actually contains about 3×10^9 base pairs, not 300 (incorrect)

Step 2: Conclusion.
Thus, the wrongly matched pair is "Human genome - 300 bases".

Quick Tip

Remember: Human genome 3 billion base pairs (not 300!).

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15. Which one of the following are at higher risk of extinction due to habitat destruction?
(A) Amphibians
(B) Mammals
(C) Echinoderms
(D) Birds

Correct Answer: (1) Amphibians

Solution:
Concept: Certain groups of organisms are more sensitive to environmental changes and habitat destruction.
Step 1: Understanding amphibians.
Amphibians have a dual life (aquatic and terrestrial) and permeable skin, making them highly sensitive to environmental changes.
Step 2: Impact of habitat destruction.
They depend on both land and water habitats, so destruction of either severely affects their survival.
Step 3: Evaluate options.

- Amphibians → Highly sensitive and most affected (correct)
- Mammals → More adaptable (incorrect)
- Echinoderms → Marine, less directly affected (incorrect)
- Birds → Can migrate/adapt (incorrect)

Step 4: Conclusion.
Thus, amphibians are at higher risk of extinction due to habitat destruction.

Quick Tip

Remember: Amphibians = Environmental indicators → Highly sensitive.
