

# NAWAZ SHARIF SCHOOL OF EMINENCE (NSSE)

## Biology Teacher Recruitment Test — Full Practice Paper (100 MCQs)

Total Questions: 100

Total Marks: 100

Time: 120 Minutes

Each MCQ: 1 Mark

★ Yellow highlighted options with ✓ indicate the correct answer

### GENERAL INSTRUCTIONS

1. This paper consists of 100 Multiple Choice Questions (MCQs) covering all major biology topics.
2. Each question carries ONE mark. There is NO negative marking.
3. The correct answer for each question is highlighted in yellow with a tick (✓).
4. Topics: Genetics, Human Physiology, Botany, Ecology, Cell Biology, Microbiology, Evolution & Applied Biology.
5. This paper is intended for self-study and NSSE Biology Teacher recruitment preparation only.

### SECTION A — Genetics & Molecular Biology

Q1. Which nitrogenous base is found in RNA but NOT in DNA?

- A Adenine
- C Uracil
- B Thymine
- D Guanine

Q2. The process by which mRNA is synthesized from a DNA template is called:

- A Translation
- C Transcription
- B Replication
- D Transduction

Q3. Mendel's Law of Segregation states that:

- A Genes on different chromosomes assort independently
- B Each gamete receives only one allele of each gene pair
- C Dominant traits always mask recessive traits
- D Mutations occur at a fixed rate

Q4. Which enzyme is responsible for unwinding the DNA double helix during replication?

- A DNA polymerase
- C Helicase
- B Ligase
- D Primase

Q5. A cross between TT and tt produces offspring with genotype:

- A TT
- B Tt
- C tt
- D Both TT and tt

Q6. The central dogma of molecular biology describes information flow as:

- A RNA→DNA→Protein
- B DNA→RNA→Protein
- C Protein→RNA→DNA
- D DNA→Protein→RNA

Q7. Which RNA carries amino acids to the ribosome during translation?

- A mRNA
- C tRNA
- B rRNA
- D hnRNA

Q8. A mutation changing a single nucleotide base pair is called a:

- A Frameshift mutation
- C Point mutation
- B Chromosomal aberration
- D Translocation

Q9. According to Mendel's Law of Independent Assortment, genes on different chromosomes:

- A Are always inherited together
- C Assort independently during gamete formation
- B Show linkage
- D Always show incomplete dominance

Q10. The complementary base pair of Adenine in DNA is:

- A Uracil
- C Cytosine

B Guanine  D Thymine ^

Q11. In a dihybrid cross (AaBb x AaBb), the expected phenotypic ratio is:

A 1:2:1  C 9:3:3:1 ^

B 3:1  D 1:1:1:1

Q12. Which of the following is an example of codominance?

A ABO blood group type AB ^  C Colour blindness

B Flower colour in snapdragons  D Attached earlobes

Q13. Okazaki fragments are associated with which process?

A Transcription  C DNA replication ^

B Translation  D RNA processing

Q14. The template strand of DNA is read in which direction by RNA polymerase?

A 5' to 3'  C Both directions

B 3' to 5' ^  D Random direction

Q15. Which type of chromosomal mutation involves a segment being reversed?

A Deletion  C Inversion ^

B Duplication  D Translocation

## SECTION B — Human Physiology

Q16. Which part of the brain maintains balance and coordination?

A Cerebrum  C Cerebellum ^

B Medulla oblongata  D Hypothalamus

Q17. The functional unit of the kidney is called:

A Alveolus  C Neuron

B Nephron ^  D Villus

Q18. Which blood cells are primarily responsible for immunity?

A Red blood cells  C White blood cells ^

B Platelets  D Plasma cells

Q19. Gas exchange in the lungs occurs at the:

A Trachea  C Alveoli ^

B Bronchi  D Bronchioles

Q20. Insulin is produced by which cells of the pancreas?

A Alpha cells  C Delta cells

B Beta cells ^  D Acinar cells

Q21. Normal pH of human blood is approximately:

A 6.8  C 7.4 ^

B 7.0  D 7.8

Q22. Which chamber of the heart pumps oxygenated blood to the body?

A Right atrium  C Left atrium

B Right ventricle  D Left ventricle ^

Q23. Peristalsis is movement associated with which organ system?

A Nervous system  C Digestive system ^

B Circulatory system  D Respiratory system

Q24. The knee-jerk reflex is an example of a:

- |  |  |
|--|--|
| <input type="radio"/> A Conditioned reflex       | <input type="radio"/> C Cranial reflex   |
| <input checked="" type="radio"/> B Spinal reflex | <input type="radio"/> D Learned response |

Q25. Which organ is primarily responsible for detoxifying harmful substances in blood?

- |                                |  |
|--------------------------------|--|
| <input type="radio"/> A Kidney | <input checked="" type="radio"/> C Liver |
| <input type="radio"/> B Spleen | <input type="radio"/> D Pancreas         |

Q26. The hormone responsible for regulating blood calcium levels is:

- |                                   |  |
|-----------------------------------|--|
| <input type="radio"/> A Insulin   | <input checked="" type="radio"/> C Parathyroid hormone |
| <input type="radio"/> B Thyroxine | <input type="radio"/> D Adrenaline                     |

Q27. Which part of the nephron is responsible for selective reabsorption?

- |  |   |
|--|---|
| <input type="radio"/> A Glomerulus       | <input checked="" type="radio"/> C Proximal convoluted tubule |
| <input type="radio"/> B Bowman's capsule | <input type="radio"/> D Collecting duct                       |

Q28. The sinoatrial (SA) node is located in the:

- |   |   |
|---|---|
| <input type="radio"/> A Left ventricle          | <input type="radio"/> C Left atrium     |
| <input checked="" type="radio"/> B Right atrium | <input type="radio"/> D Right ventricle |

Q29. Which blood component carries oxygen throughout the body?

- |   |   |
|---|---|
| <input type="radio"/> A White blood cells | <input type="radio"/> C Plasma                                    |
| <input type="radio"/> B Platelets         | <input checked="" type="radio"/> D Haemoglobin in red blood cells |

Q30. The process by which urine is formed involves filtration, reabsorption, and:

- |  |                                   |
|--|-----------------------------------|
| <input checked="" type="radio"/> A Secretion | <input type="radio"/> C Digestion |
| <input type="radio"/> B Absorption           | <input type="radio"/> D Excretion |

## SECTION C — Botany & Plant Biology

Q31. The raw materials for photosynthesis are:

- |   |  |
|---|--|
| <input type="radio"/> A Oxygen and glucose                  | <input type="radio"/> C ATP and NADPH      |
| <input checked="" type="radio"/> B Carbon dioxide and water | <input type="radio"/> D Glucose and oxygen |

Q32. Which organelle is the site of photosynthesis?

- |                                      |  |
|--------------------------------------|--|
| <input type="radio"/> A Mitochondria | <input checked="" type="radio"/> C Chloroplast |
| <input type="radio"/> B Ribosome     | <input type="radio"/> D Vacuole                |

Q33. Vascular tissue transporting water and minerals from roots to leaves is:

- |  |                                 |
|--|---------------------------------|
| <input type="radio"/> A Phloem           | <input type="radio"/> C Cambium |
| <input checked="" type="radio"/> B Xylem | <input type="radio"/> D Cortex  |

Q34. Transpiration in plants primarily occurs through:

- |                               |  |
|-------------------------------|--|
| <input type="radio"/> A Roots | <input checked="" type="radio"/> C Stomata |
| <input type="radio"/> B Stem  | <input type="radio"/> D Lenticels          |

Q35. Which plant hormone promotes cell elongation and causes phototropism?

- |                                     |  |
|-------------------------------------|--|
| <input type="radio"/> A Cytokinin   | <input checked="" type="radio"/> C Auxin |
| <input type="radio"/> B Gibberellin | <input type="radio"/> D Abscisic acid    |

Q36. Plants losing water in liquid form through leaf margins is called:

- |  |                                     |
|--|-------------------------------------|
| <input type="radio"/> A Transpiration        | <input type="radio"/> C Evaporation |
| <input checked="" type="radio"/> B Guttation | <input type="radio"/> D Osmosis     |

Q37. Which part of the flower develops into the fruit?

- A Sepal  C Ovary  D Stamen
- B Petal

Q38. C4 plants have an advantage over C3 plants because they:

- A Produce more chlorophyll  C Have larger leaves
- B Can fix CO<sub>2</sub> more efficiently in hot conditions  D Require less sunlight

Q39. The male reproductive organ of a flower is the:

- A Pistil  C Stamen  D Ovule
- B Carpel

Q40. Osmosis is movement of water through a semi-permeable membrane from:

- A High solute concentration to low  C High temperature to low
- B Low solute concentration to high  D High pressure to low

Q41. Which pigment is primarily responsible for capturing light energy in plants?

- A Carotenoid  C Chlorophyll a  D Phycocyanin
- B Xanthophyll

Q42. The dark reactions of photosynthesis (Calvin cycle) occur in the:

- A Thylakoid membrane  C Cytoplasm
- B Stroma of chloroplast  D Mitochondria

Q43. Guard cells regulate the opening and closing of:

- A Lenticels  C Root hair cells
- B Stomata  D Vascular bundles

Q44. Which plant tissue provides mechanical support to young stems?

- A Parenchyma  C Sclerenchyma
- B Collenchyma  D Epidermis

Q45. The process by which plants make food using sunlight is called:

- A Respiration  C Photosynthesis  D Transpiration
- B Fermentation

## SECTION D — Ecology & Environment

Q46. Which trophic level do decomposers occupy?

- A First (Producers)  C Third (Secondary consumers)
- B Second (Primary consumers)  D They occupy all trophic levels

Q47. Nitrogen cycle: atmospheric nitrogen is converted to ammonia by:

- A Denitrifying bacteria  C Nitrogen-fixing bacteria  D Decomposers
- B Nitrifying bacteria

Q48. A food web differs from a food chain because it:

- A Shows only one feeding path  C Only includes producers and consumers
- B Shows multiple feeding relationships  D Does not include decomposers

Q49. The biome characterized by permafrost and extreme cold year-round is:

- A Taiga  C Desert
- B Tundra  D Savanna

Q50. Which is an example of a mutualistic relationship?

- A Lion and zebra  C Clownfish and sea anemone  D Tick and dog
- B Mistletoe and oak tree

Q51. The greenhouse effect is primarily caused by increased levels of:

- A Oxygen  C Carbon dioxide  D Argon
- B Nitrogen

Q52. Primary succession begins on:

- A Abandoned farmland  C Bare rock with no soil  D Flooded meadows
- B Burnt forest areas

Q53. Biodiversity is highest in which biome?

- A Tundra  C Tropical rainforest  D Temperate grassland
- B Desert

Q54. The relationship where one organism benefits and the other is unaffected is:

- A Mutualism  C Parasitism  D Predation
- B Commensalism

Q55. Eutrophication of water bodies is caused by excess:

- A Carbon dioxide  C Nitrogen and phosphorus  D Heavy metals
- B Oxygen

Q56. Which gas is produced during denitrification?

- A Ammonia  C Carbon dioxide  D Hydrogen sulfide
- B Nitrous oxide (N<sub>2</sub>O)

Q57. An ecological niche refers to:

- A The physical location of an organism  C The number of individuals in a population  D The food an organism eats
- B The role and position of a species in its environment

Q58. Which factor is ABIOTIC in an ecosystem?

- A Bacteria  C Temperature  D Insects
- B Fungi

Q59. The carbon cycle is important because carbon is a key component of:

- A Water  C Minerals  D Soil only
- B All organic molecules

Q60. Keystone species are important because their removal:

- A Has no effect on the ecosystem  C Only affects predators  D Only affects prey
- B Causes dramatic changes in ecosystem structure

## SECTION E — Cell Biology

Q61. Which organelle is known as the 'powerhouse of the cell'?

- A Nucleus  C Mitochondria  D Golgi apparatus
- B Ribosome

Q62. Cell division producing two identical daughter cells is called:

- A Meiosis  C Binary fission  D Budding
- B Mitosis

Q63. Which structure controls what enters and exits the cell?

- A Cell wall  C Cytoplasm

B Cell membrane  D Nucleus

Q64. Ribosomes are the sites of:

A DNA replication  C Lipid synthesis  
 B Protein synthesis  D ATP production

Q65. The Golgi apparatus is primarily responsible for:

A Energy production  C Modifying and packaging proteins  
 B Protein synthesis  D DNA replication

Q66. Which phase of mitosis involves chromosomes aligning at the cell's equator?

A Prophase  C Anaphase  
 B Metaphase  D Telophase

Q67. Lysosomes contain:

A Digestive enzymes  C Ribosomes  
 B Photosynthetic pigments  D ATP

Q68. The endoplasmic reticulum studded with ribosomes is called:

A Smooth ER  C Golgi body  
 B Rough ER  D Lysosome

Q69. Turgor pressure in plant cells is maintained by the:

A Cell wall  C Central vacuole  
 B Chloroplast  D Mitochondria

Q70. During meiosis, how many daughter cells are produced?

A 2  C 8  
 B 4  D 1

Q71. The nuclear membrane disappears during which phase of mitosis?

A Interphase  C Metaphase  
 B Prophase  D Anaphase

Q72. Which cell type lacks a nucleus?

A Plant cell  C Bacterial cell  
 B Animal cell  D Fungal cell

## SECTION F — Microbiology

Q73. Bacteria requiring oxygen for survival are called:

A Anaerobes  C Facultative anaerobes  
 B Aerobes  D Microaerophiles

Q74. Viruses are considered non-living because they:

A Cannot reproduce  C Cannot carry out metabolism independently  
 B Lack a cell membrane  D Have no genetic material

Q75. Which disease is caused by a bacterium?

A Influenza  C Tuberculosis  
 B Polio  D Hepatitis B

Q76. Penicillin was discovered by:

A Louis Pasteur  C Alexander Fleming  
 B Robert Koch  D Joseph Lister

Q77. Which of the following is a prokaryote?

- |                                  |  |
|----------------------------------|--|
| <input type="radio"/> A Amoeba   | <input checked="" type="radio"/> C E. coli |
| <input type="radio"/> B Mushroom | <input type="radio"/> D Yeast              |

Q78. Antibiotics are effective against:

- |   |                                |
|---|--------------------------------|
| <input type="radio"/> A Viruses             | <input type="radio"/> C Fungi  |
| <input checked="" type="radio"/> B Bacteria | <input type="radio"/> D Prions |

Q79. The mode of reproduction in bacteria is primarily:

- |   |   |
|---|---|
| <input type="radio"/> A Budding                   | <input type="radio"/> C Spore formation |
| <input checked="" type="radio"/> B Binary fission | <input type="radio"/> D Conjugation     |

Q80. Which structure helps bacteria attach to surfaces?

- |   |                                 |
|---|---------------------------------|
| <input type="radio"/> A Flagella        | <input type="radio"/> C Capsule |
| <input checked="" type="radio"/> B Pili | <input type="radio"/> D Plasmid |

Q81. Prions are infectious agents made of:

- |                             |  |
|-----------------------------|--|
| <input type="radio"/> A DNA | <input checked="" type="radio"/> C Protein |
| <input type="radio"/> B RNA | <input type="radio"/> D Lipids             |

Q82. Pasteurization is used to:

- |  |  |
|--|--|
| <input type="radio"/> A Kill all microorganisms                            | <input type="radio"/> C Sterilize surgical equipment |
| <input checked="" type="radio"/> B Reduce pathogenic bacteria through heat | <input type="radio"/> D Preserve food by freezing    |

## SECTION G — Evolution

Q83. Natural selection acts on:

- |  |  |
|--|--|
| <input type="radio"/> A Genotype only        | <input type="radio"/> C DNA sequences only |
| <input checked="" type="radio"/> B Phenotype | <input type="radio"/> D Mutations only     |

Q84. The concept of 'survival of the fittest' is associated with:

- |   |   |
|---|---|
| <input type="radio"/> A Gregor Mendel         | <input checked="" type="radio"/> C Charles Darwin |
| <input type="radio"/> B Jean-Baptiste Lamarck | <input type="radio"/> D Thomas Malthus            |

Q85. Homologous structures have:

- |  |  |
|--|--|
| <input type="radio"/> A Same function but different origins                        | <input type="radio"/> C No evolutionary relationship |
| <input checked="" type="radio"/> B Same origin but may perform different functions | <input type="radio"/> D Only found in vertebrates    |

Q86. Which provides the strongest evidence for evolution?

- |   |   |
|---|---|
| <input type="radio"/> A Fossils             | <input type="radio"/> C Molecular genetics (DNA comparison) |
| <input type="radio"/> B Comparative anatomy | <input checked="" type="radio"/> D All of the above         |

Q87. Vestigial organs are structures that:

- |   |   |
|---|---|
| <input type="radio"/> A Perform important functions   | <input type="radio"/> C Are unique to humans                |
| <input checked="" type="radio"/> B Are remnants of ancestral forms with no current function | <input type="radio"/> D Develop only during embryonic stage |

Q88. Analogous structures are structures that:

- |   |  |
|---|--|
| <input type="radio"/> A Have the same evolutionary origin                               | <input type="radio"/> C Are identical in all species |
| <input checked="" type="radio"/> B Perform similar functions but have different origins | <input type="radio"/> D Never appear in fossils      |

Q89. The process by which new species arise from existing ones is called:

- |   |   |
|---|---|
| <input type="radio"/> A Adaptation        | <input checked="" type="radio"/> C Speciation |
| <input type="radio"/> B Natural selection | <input type="radio"/> D Mutation              |

Q90. Adaptive radiation is best described as:

- A One species evolving into a single new species
- B Multiple species evolving from a common ancestor to fill
- C Random genetic drift in small populations
- D The extinction of non-adaptive traits

## SECTION H — General & Applied Biology

Q91. Which vitamin is produced when human skin is exposed to sunlight?

- A Vitamin A
- B Vitamin B12
- C Vitamin C
- D Vitamin D

Q92. The scientific name of humans is:

- A Homo erectus
- B Homo sapiens
- C Homo habilis
- D Pan troglodytes

Q93. Which of the following is NOT a function of the skeleton?

- A Support
- B Protection
- C Gas exchange
- D Mineral storage

Q94. The process of breaking down glucose to release energy is called:

- A Photosynthesis
- B Transpiration
- C Cellular respiration
- D Fermentation

Q95. Which macromolecule serves as the primary energy storage in animals?

- A Proteins
- B Carbohydrates
- C Lipids
- D Nucleic acids

Q96. Enzymes are biological catalysts made of:

- A Carbohydrates
- B Lipids
- C Proteins
- D Nucleic acids

Q97. The lock-and-key model describes how enzymes interact with their:

- A Products
- B Substrates
- C Cofactors
- D Inhibitors

Q98. Which domain includes all multicellular organisms with membrane-bound nuclei?

- A Bacteria
- B Archaea
- C Eukarya
- D Prokarya

Q99. Stem cells are unique because they can:

- A Only produce red blood cells
- B Differentiate into many cell types
- C Never divide
- D Only exist in embryos

Q100. Which of the following is a greenhouse gas?

- A Nitrogen
- B Argon
- C Methane
- D Neon