

Entrance Exam Practice Questions - Biology

- 1. What is a gene?**
 - A. A section of DNA that contains the instructions for building a protein
 - B. A protein that determines a trait
 - C. A molecule that carries oxygen
 - D. A structure that produces energy in cells
- 2. What is the genotype of an organism?**
 - A. The physical appearance of the organism
 - B. The expression of the genetic makeup
 - C. The sequence of nucleotides in DNA
 - D. The organism's genetic makeup (its genes)
- 3. A nucleotide is made of which components?**
 - A. A nitrogenous base, a phosphate group, and a pentose sugar
 - B. A nitrogenous base, a fatty acid, and an amino acid
 - C. A nitrogenous base, an amino acid, and a phosphate group
 - D. A series of nitrogenous bases and a hexose sugar
- 4. Key difference between mitosis and meiosis:**
 - A. Mitosis produces haploid cells; meiosis diploid
 - B. Mitosis produces four cells; meiosis two
 - C. Mitosis produces diploid cells; meiosis haploid cells
 - D. Both processes are identical
- 5. Matched chromosomes in diploid cells are called:**
 - A. Haploid chromosomes
 - B. Homologous chromosomes
 - C. Sister chromatids
 - D. Sex chromosomes
- 6. Crossing over during prophase I is:**
 - A. Chromosomes lining up
 - B. Homologous chromosomes exchanging parts
 - C. Cell division
 - D. Chromatid separation
- 7. Which cells undergo meiosis?**
 - A. Somatic cells
 - B. Egg and sperm cells
 - C. Nerve cells
 - D. Muscle cells

8. Chromosomes align at the equator during:

- A. Prophase
- B. Metaphase
- C. Telophase
- D. Anaphase

9. Cytokinesis refers to:

- A. Cell movement
- B. Division of cytoplasm
- C. Nuclear division
- D. Chromosome reduction

10. Which process contributes most to genetic variation?

- A. Mitosis
- B. Binary fission
- C. Crossing over
- D. DNA repair

11. A codon represents:

- A. One nitrogen base
- B. An amino acid or stop/start signal
- C. Two nucleotides
- D. A sugar molecule

12. tRNA anticodon is:

- A. Changeable
- B. Catalytic
- C. Complementary to mRNA codon
- D. The amino-acid binding site

13. During transcription:

- A. Both DNA strands are copied
- B. Only one DNA strand is used
- C. RNA is made from protein
- D. DNA is duplicated

14. Translation occurs when:

- A. tRNA carries amino acids to nucleus
- B. Ribosomes enter nucleus
- C. Polypeptides are synthesized on ribosomes using mRNA
- D. DNA is copied

15. Translation stops when:

- A. Stop codon is reached
- B. Ribosome falls off
- C. Amino acids end
- D. Cell decides to stop

16. Prokaryotes lack:

- A. DNA
- B. Cell wall
- C. Ribosomes
- D. Endoplasmic reticulum

17. In humans, black hair (B) is dominant over brown hair (b). If the mother is BB and the father is Bb, what is the probability that their child will have brown hair?

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

18. Which system works together with the nervous system to regulate body functions?

- A. Digestive
- B. Endocrine
- C. Skeletal
- D. Respiratory

19. Rough vs smooth ER:

- A. Rough detoxifies drugs
- B. Rough has ribosomes; smooth doesn't
- C. Rough stores waste
- D. Smooth produces proteins

20. An antibiotic blocks bacterial RNA polymerase. Which process stops?

- A. Translation
- B. DNA replication
- C. Transcription
- D. Glycolysis

21. Which structure allows nerve impulses to travel along a neuron?

- A. Ribosome
- B. Axon
- C. Nucleus
- D. Golgi apparatus

22. Pancreas produces:

- A. Insulin & glucagon
- B. Oxytocin & prolactin
- C. Estrogen & progesterone
- D. Epinephrine & norepinephrine

23. Nervous system cells:

- A. Dendrites & axons
- B. Neurons & glial cells
- C. Myelin & organelles
- D. Brain cells & axons

24. Removal of the pituitary gland would MOST directly disrupt:

- A. Local tissue hormones
- B. Neural impulses
- C. Endocrine coordination
- D. Digestion

25. Axon insulation provided by:

- A. Dendrites
- B. Cell body
- C. Myelin sheath
- D. Nucleus

26. Sex hormones:

- A. Only women produce estrogen
- B. Men produce only androgens
- C. Both sexes produce estrogens, progestins & androgens
- D. Progestins only in men

27. Melatonin regulates:

- A. Pain
- B. Relaxation
- C. Biological clock
- D. Growth

28. Endorphins are:

- A. Pineal hormones
- B. Pain-relief neurotransmitters
- C. Digestive chemicals
- D. Growth hormones

29. Skeleton consists of:

- A. Bones & muscles
- B. Cartilage & muscles
- C. Bones & cartilage
- D. Tendons & ligaments

30. Red-green color blindness is X-linked recessive. A color-blind man marries a woman who is a carrier. What is the probability that their son will be color-blind?

- A. 0%
- B. 25%
- C. 50%
- D. 100%

31. Which structure connects muscles to bones?

- A. Ligaments
- B. Tendons
- C. Cartilage
- D. Joints

32. Triceps:

- A. Abdomen flexor
- B. Back of upper arm; straightens elbow
- C. Thigh muscle
- D. Chest muscle

33. Circulatory system:

- A. Heart, lungs, arteries
- B. Heart, blood vessels, blood
- C. Capillaries & veins
- D. Heart & veins

34. Heart chambers:

- A. Two
- B. Three
- C. Five
- D. Four

35. Blood components:

- A. Plasma & RBCs
- B. Plasma, RBCs, WBCs, platelets
- C. WBCs & platelets
- D. Plasma only

36. RBC function:

- A. Immunity
- B. Oxygen transport
- C. Glucose transport
- D. Clotting

37. If oxygen delivery to tissues decreases, which response occurs FIRST?

- A. Increased erythrocytes
- B. Increased ventilation
- C. Decreased ATP
- D. Increased antibody production

38. Nephrons are:

- A. Kidney vessels
- B. Functional kidney units
- C. Oxygen cells
- D. Hormones

39. Which example shows the body maintaining balance (homeostasis)?

- A. Sweating when body temperature rises
- B. Muscle contraction
- C. Digestion of food
- D. Cell division

40. Lymph nodes located:

- A. Digestive tract
- B. Bloodstream
- C. Lymph vessels (neck, armpits, groin)
- D. Kidneys

41. Swollen lymph nodes mean:

- A. Dehydration
- B. Infection response
- C. Nutrient storage
- D. Excess RBCs

42. Immune system parts:

- A. Innate & adaptive
- B. RBCs & WBCs
- C. Circulatory & lymphatic
- D. Skin & mucus

43. Innate immunity includes:

- A. Antibodies
- B. Skin, mucus, innate cells
- C. B & T cells
- D. Spleen

44. Adaptive immune cells:

- A. Macrophages
- B. T & B cells
- C. Eosinophils
- D. Platelets

45. Autoimmune disease:

- A. Immune system attacks own cells
- B. Bacterial disease
- C. Viral disease
- D. Lymph-only disease

46. Destruction of pancreatic beta cells causes:

- A. Multiple sclerosis
- B. Lupus
- C. Type 1 diabetes
- D. AIDS

47. The primary energy currency of the cell is:

- A. NADH
- B. FADH₂
- C. ATP
- D. GTP

48. Two carriers for phenylketonuria (autosomal recessive) have a child. What is probability the child is unaffected but a carrier?

- A. 25%
- B. 50%
- C. 75%
- D. 100%

49. Proteins are composed of:

- A. Fatty acids
- B. Nucleotides
- C. Amino acids
- D. Monosaccharides

50. Which structure is present in eukaryotic but not prokaryotic cells?

- A. Ribosomes
- B. Cell membrane
- C. Nucleus
- D. Cytoplasm

51. Anabolism refers to:

- A. Breakdown of molecules
- B. Energy release
- C. Synthesis of complex molecules
- D. Excretion of waste

52. A gene locus is:

- A. A type of chromosome
- B. The position of a gene on a chromosome
- C. A mutated allele
- D. A protein product

53. Alternative forms of the same gene are called:

- A. Chromatids
- B. Genomes
- C. Alleles
- D. Loci

54. Mendel's Law of Segregation states that:

- A. Traits blend together
- B. Alleles separate during gamete formation
- C. Only dominant traits are inherited
- D. Genes are located in cytoplasm

55. Stem cells are best described as:

- A. Fully differentiated cells
- B. Cells unable to divide
- C. Potent cells capable of differentiation
- D. Only found in embryos

56. Which structure helps maintain electrical activity in neurons?

- A. Ribosomes
- B. Ion channels
- C. Golgi apparatus
- D. Lysosomes

57. Which tissue is responsible for signal transmission?

- A. Epithelial
- B. Connective
- C. Muscular
- D. Nervous

58. The main function of epithelial tissue is:

- A. Movement
- B. Support
- C. Protection and absorption
- D. Electrical conduction

59. Homeostasis refers to:

- A. Growth of tissues
- B. Reproduction
- C. Maintenance of internal balance
- D. Cellular division

60. Which microorganism causes AIDS?

- A. Bacterium
- B. Fungus
- C. Virus
- D. Protozoa

61. HIV primarily attacks:

- A. Red blood cells
- B. Neurons
- C. CD4 T-lymphocytes
- D. Platelets

62. Hepatitis B and C mainly affect the:

- A. Heart
- B. Liver
- C. Kidneys
- D. Lungs

63. The causative agent of tuberculosis is:

- A. Streptococcus pneumoniae
- B. Mycobacterium tuberculosis
- C. Clostridium tetani
- D. Bordetella pertussis

64. Which disease is caused by Clostridium tetani?

- A. Diphtheria
- B. Pneumonia
- C. Tetanus
- D. Anthrax

65. Autotrophic bacteria obtain energy from:

- A. Organic matter
- B. Host organisms
- C. Light or inorganic substances
- D. Dead tissue

66. Blood type: A mother (IAi) and father (IBi) have children. Probability of child with type O blood?

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

67. Antibodies are produced by:

- A. Red blood cells
- B. Platelets
- C. B lymphocytes
- D. Neurons

68. The sympathetic nervous system generally:

- A. Slows heart rate
- B. Stimulates digestion
- C. Prepares the body for stress
- D. Promotes sleep

69. Adrenaline increases:

- A. Blood glucose and heart rate
- B. Urine production
- C. Digestion
- D. Immune suppression

70. Which formed element of blood is responsible for oxygen transport?

- A. Leukocytes
- B. Platelets
- C. Erythrocytes
- D. Plasma

71. Hemophilia is characterized by:

- A. Reduced white blood cells
- B. Impaired blood clotting
- C. Low hemoglobin
- D. Excess platelets

72. The main pumping chamber of the heart is the:

- A. Right atrium
- B. Left atrium
- C. Right ventricle
- D. Left ventricle

73. Spermatogenesis occurs in the:

- A. Prostate
- B. Ovaries
- C. Testes
- D. Epididymis

74. Compared to the egg cell, sperm cells are:

- A. Larger and immobile
- B. Rich in cytoplasm
- C. Smaller and motile
- D. Contain mitochondria only

75. Down syndrome is caused by:

- A. Monosomy X
- B. Extra chromosome 21
- C. Extra Y chromosome
- D. Deletion of chromosome 5

76. Klinefelter syndrome is characterized by:

- A. XO karyotype
- B. XXX karyotype
- C. XXY karyotype
- D. XYY karyotype

77. Which shape is characteristic of cocci bacteria?

- A. Rod-shaped
- B. Spiral
- C. Spherical
- D. Comma-shaped

78. Rod-shaped bacteria are called:

- A. Cocci
- B. Bacilli
- C. Spirilla
- D. Vibrios

79. Which structure protects bacteria from harsh environmental conditions?

- A. Ribosome
- B. Capsule
- C. Nucleoid
- D. Flagellum

80. During meiosis, failure of homologous chromosomes to separate is called:

- A. Mutation
- B. Crossing over
- C. Nondisjunction
- D. Independent assortment

81. Saprophytic bacteria obtain nutrients from:

- A. Living hosts
- B. Sunlight
- C. Dead organic matter
- D. Inorganic chemicals

82. Parasitic bacteria:

- A. Produce their own food
- B. Live independently
- C. Feed on dead organisms
- D. Live at the expense of a host

83. Which disease is caused by *Bacillus anthracis*?

- A. Tetanus
- B. Tuberculosis
- C. Anthrax
- D. Diphtheria

84. If a person has reduced kidney function, what is the most likely consequence in the body?

- A. Increased urea concentration in the blood
- B. Decreased blood glucose levels
- C. Increased filtration in Bowman's capsule
- D. Decreased aldosterone hormone levels

85. Diphtheria affects mainly the:

- A. Liver
- B. Intestines
- C. Respiratory tract
- D. Kidneys

86. Meningitis is inflammation of the:

- A. Heart muscle
- B. Lung tissue
- C. Brain membranes
- D. Bone marrow

87. Pneumonia primarily affects the:

- A. Brain
- B. Lungs
- C. Heart
- D. Skin

88. Poliomyelitis mainly damages:

- A. Digestive system
- B. Respiratory epithelium
- C. Motor neurons
- D. Kidneys

89. A patient has a defect in lysosomal enzymes, causing accumulation of undigested substrates. Which type of disorder is this?

- A. Mitochondrial disorder
- B. Lysosomal storage disease
- C. Peroxisomal disorder
- D. Cytoskeletal disorder

90. Influenza is caused by:

- A. Bacteria
- B. Fungi
- C. Parasites
- D. Viruses

91. Chickenpox (varicella) is characterized by:

- A. Chronic cough
- B. Skin rash with vesicles
- C. Paralysis
- D. Severe diarrhea

92. Sterilization refers to:

- A. Reduction of microbes
- B. Killing viruses only
- C. Complete destruction of all microorganisms
- D. Cleaning surfaces

93. Gluconeogenesis occurs mainly in:

- A. Muscle
- B. Liver
- C. Kidney medulla
- D. Brain

94. Viruses differ from bacteria because viruses:

- A. Have ribosomes
- B. Can reproduce independently
- C. Contain DNA or RNA but not both
- D. Have cell walls

95. A man with X-linked hemophilia marries a normal woman. Probability that daughter will be a carrier?

- A. 0%
- B. 25%
- C. 50%
- D. 100%

96. The main routes of HIV transmission are:

- A. Airborne droplets
- B. Contaminated food
- C. Blood and sexual contact
- D. Skin contact

97. Early symptoms of AIDS may include:

- A. Hair loss
- B. Fever and fatigue
- C. Bone fractures
- D. Blindness

98. Which immune response is antigen-specific?

- A. Inflammation
- B. Phagocytosis
- C. Antibody production
- D. Fever

99. Antibodies specifically:

- A. Destroy neurons
- B. Digest food
- C. Bind to antigens
- D. Produce hormones

100. Vaccination works by:

- A. Killing bacteria directly
- B. Providing ready-made antibodies
- C. Stimulating immune memory
- D. Increasing red blood cells

101. The parasympathetic nervous system mainly:

- A. Increases heart rate
- B. Prepares the body for stress
- C. Promotes rest and digestion
- D. Raises blood pressure

102. Noradrenaline primarily functions as:

- A. Digestive enzyme
- B. Neurotransmitter and hormone
- C. Structural protein
- D. Immune factor

103. Absorption of nutrients occurs mainly in the:

- A. Stomach
- B. Large intestine
- C. Small intestine
- D. Esophagus

104. The kidneys are primarily responsible for:

- A. Oxygen transport
- B. Hormone production
- C. Excretion of metabolic waste
- D. Digestion

105. Which blood vessel carries blood away from the heart?

- A. Vein
- B. Capillary
- C. Artery
- D. Venule

106. Veins differ from arteries because veins:

- A. Carry oxygenated blood only
- B. Have thicker walls
- C. Contain valves
- D. Have higher pressure

107. The skeletal system mainly provides:

- A. Hormone regulation
- B. Body movement and protection
- C. Digestion
- D. Heat production

108. Muscle tissue functions primarily in:

- A. Signal transmission
- B. Support
- C. Contraction and movement
- D. Protection

109. Which hormone stimulates milk production?

- A. Oxytocin
- B. Prolactin
- C. TSH
- D. LH

110. Oogenesis occurs in the:

- A. Testes
- B. Uterus
- C. Ovaries
- D. Fallopian tubes

111. Compared to sperm, the egg cell:

- A. Is smaller
- B. Is motile
- C. Contains more cytoplasm
- D. Lacks nucleus

112. Blood plasma mainly consists of:

- A. Cells
- B. Platelets
- C. Water and dissolved substances
- D. Hemoglobin

113. Anemia is most commonly caused by:

- A. High white blood cells
- B. Low hemoglobin
- C. Excess platelets
- D. Viral infection

114. Leukemia is a cancer of:

- A. Red blood cells
- B. Bone tissue
- C. White blood cells
- D. Platelets

115. Malaria is transmitted by:

- A. Ticks
- B. Houseflies
- C. Mosquitoes
- D. Lice

116. The left ventricle pumps blood into the:

- A. Pulmonary artery
- B. Vena cava
- C. Aorta
- D. Right atrium

117. Coronary arteries supply blood to the:

- A. Brain
- B. Lungs
- C. Kidneys
- D. Heart muscle

118. The locomotor system includes:

- A. Heart and lungs
- B. Bones and muscles
- C. Liver and kidneys
- D. Skin and glands

119. A carrier mother for an X-linked disorder has a normal father. Probability that a son is affected?

- A. 0%
- B. 25%
- C. 50%
- D. 100%

120. If a child inherits one allele for blue eyes (b) from the mother and one for brown eyes (B) from the father, what is the child's phenotype?

- A. Blue eyes
- B. Brown eyes
- C. Heterozygous eyes
- D. Cannot be determined

121. A bacterial toxin blocks ribosomal activity. What cellular process stops first?

- A. DNA replication
- B. Lipid synthesis
- C. Protein synthesis
- D. Glycolysis

122. Capillaries are specialized for:

- A. High-pressure flow
- B. Gas and nutrient exchange
- C. Hormone production
- D. Immune defense

123. The main function of platelets is:

- A. Oxygen transport
- B. Immune response
- C. Blood clotting
- D. Hormone secretion

124. The cardiac cycle refers to:

- A. Heart development
- B. Sequence of heart contraction and relaxation
- C. Blood formation
- D. Oxygen exchange

125. Life cycle refers to:

- A. Daily activity rhythm
- B. Sequence of developmental stages of an organism
- C. Cellular respiration
- D. Aging process

126. Catabolism is best defined as:

- A. Formation of complex molecules
- B. Breakdown of molecules to release energy
- C. DNA replication
- D. Cell division

- 127. Failure of mitochondria in muscle cells would MOST directly impair:**
- A. DNA replication
 - B. ATP production
 - C. Ribosome assembly
 - D. Protein folding
- 128. If ribosomes detach prematurely from mRNA, which process is directly impaired?**
- A. Transcription
 - B. DNA replication
 - C. Protein synthesis
 - D. RNA splicing
- 129. Which inheritance pattern produces affected males only, transmitted by females?**
- A. Autosomal dominant
 - B. Autosomal recessive
 - C. X-linked recessive
 - D. Codominant
- 130. Which structure is present in plant but not animal cells?**
- A. Nucleus
 - B. Mitochondria
 - C. Cell wall
 - D. Ribosomes
- 131. The nucleoid region is found in:**
- A. Plant cells
 - B. Animal cells
 - C. Prokaryotic cells
 - D. Fungal cells
- 132. Which process allows substances to pass across membranes without energy?**
- A. Active transport
 - B. Endocytosis
 - C. Diffusion
 - D. Exocytosis

133. The transport system of humans consists mainly of:

- A. Digestive tract
- B. Nervous system
- C. Circulatory system
- D. Skeletal system

134. Failure of apoptosis during development most directly increases risk of:

- A. Autoimmune disease
- B. Cancer
- C. Viral infection
- D. Osteoporosis

135. Which organ participates in both excretion and osmoregulation?

- A. Liver
- B. Skin
- C. Kidneys
- D. Pancreas

136. During meiosis:

- A. Daughter cells are diploid
- B. Chromosome number is halved
- C. No genetic variation occurs
- D. Only somatic cells divide

137. Independent assortment means that:

- A. Genes always travel together
- B. Traits blend
- C. Alleles segregate randomly
- D. Only dominant traits appear

138. A homozygous individual has:

- A. Two different alleles
- B. No alleles
- C. Two identical alleles
- D. Extra chromosomes

- 139. Which syndrome results from monosomy X?**
- A. Down syndrome
 - B. Turner syndrome
 - C. Klinefelter syndrome
 - D. Edwards syndrome
- 140. In a dihybrid cross $AaBb \times AaBb$, probability of offspring homozygous recessive for both traits?**
- A. $1/16$
 - B. $1/4$
 - C. $1/8$
 - D. $1/2$
- 141. Which hormone increases blood calcium levels by stimulating bone resorption?**
- A. Calcitonin
 - B. Parathyroid hormone (PTH)
 - C. Thyroxine (T4)
 - D. Insulin
- 142. Two heterozygous parents ($Aa \times Aa$). What fraction of offspring are phenotypically dominant but genotypically heterozygous?**
- A. $1/4$
 - B. $1/2$
 - C. $3/4$
 - D. $2/3$
- 143. Which organ integrates nervous and endocrine responses?**
- A. Cerebellum
 - B. Hypothalamus
 - C. Medulla
 - D. Thalamus
- 144. A patient lacks insulin production. Which change occurs FIRST?**
- A. Increased glycogen storage
 - B. Reduced blood glucose
 - C. Increased fat breakdown
 - D. Decreased glucagon

145. A patient has damage to pancreatic beta cells. Which combination is MOST likely?

- A. ↓ insulin, ↓ blood glucose
- B. ↓ insulin, ↑ blood glucose
- C. ↑ insulin, ↓ blood glucose
- D. ↑ insulin, ↑ blood glucose

146. A toxin blocks Golgi function. What accumulates in cytoplasm?

- A. Lipids
- B. Modified proteins
- C. Unprocessed proteins
- D. DNA

147. Two parents heterozygous for cystic fibrosis (autosomal recessive, Ff × Ff). Probability of affected child?

- A. 25%
- B. 50%
- C. 75%
- D. 100%

148. Which part of the human brain controls balance and coordination?

- A. Cerebellum
- B. Cerebrum
- C. Medulla oblongata
- D. Hypothalamus

149. Loss of surfactant in lungs MOST directly causes:

- A. Increased oxygen diffusion
- B. Alveolar collapse
- C. Bronchodilation
- D. Reduced CO₂

150. Which of the following is a competitive inhibitor of an enzyme?

- A. Binds to the active site and prevents substrate binding
- B. Binds to an allosteric site and changes enzyme shape
- C. Permanently inactivates the enzyme
- D. Degrades the substrate