UKMDO 2025 Examination

This quiz contains 160 questions related to human genetics, physiology, pathology and more various medical topics. Please answer all questions to the best of your knowledge.

* Indicates required question

1. Email *

2. Full name *

3. Email address - MAKE SURE THERE ARE NO MISTAKES *

4. Which organelle is the site of aerobic respiration? 1 p

Mark only one oval.

- A) Nucleus
- B) Chloroplast
- C) Mitochondrion
- D) Golgi apparatus
- E) Lysosome

5. The monomers of proteins are: 1 p

Mark only one oval.

- A) Fatty acids
- B) Amino acids
- C) Nucleotides
- D) Monosaccharides
- E) Steroids

6. DNA is made up of repeating units called: 1 p

Mark only one oval.

- A) Amino acids
- B) Nucleotides
- C) Monosaccharides
- D) Fatty acids
- E) Glycerol

7. Which base is found in RNA but not in DNA? 1 p

Mark only one oval.

- A) Thymine
- B) Uracil
- C) Adenine
- D) Cytosine
- E) Guanine

8. Which cell structure controls entry and exit of substances? 1 p

Mark only one oval.

- A) Mitochondrion
- B) Nucleus
- C) Cell membrane
- D) Ribosome
- E) Lysosome

9. The process by which a cell divides into two identical daughter cells is called: 1 p

Mark only one oval.

- A) Meiosis
- B) Binary fission
- C) Mitosis
- D) Cytolysis
- E) Apoptosis

10. The molecule that carries the genetic code from the nucleus to ribosomes is: 1 p

Mark only one oval.

- A) tRNA
- B) mRNA
- C) rRNA
- D) snRNA
- E) miRNA

11. In humans, the diploid chromosome number is: 1 p

Mark only one oval.

- A) 22
- B) 23
- C) 44
- D) 46
- E) 92

12. Which macromolecule is the main component of cell membranes? 1 p

Mark only one oval.

- A) Proteins
- B) Phospholipids
- C) Nucleic acids
- D) Steroids
- E) Polysaccharides

13. Which process converts glucose into pyruvate? 1 p

Mark only one oval.

- A) Krebs cycle
- B) Electron transport chain
- C) Glycolysis
- D) Fermentation
- E) Beta-oxidation

14. The ribosome is the site of: 1 p

Mark only one oval.

- A) DNA replication
- B) Protein synthesis
- C) Lipid synthesis
- D) RNA splicing
- E) ATP generation

15. Which bond holds base pairs together in DNA? 1 p

Mark only one oval.

- A) Ionic bond
- B) Peptide bond
- C) Hydrogen bond
- D) Covalent bond
- E) Disulfide bridge

16. The phase of mitosis where sister chromatids separate is: 1 p

Mark only one oval.

- A) Prophase
- B) Metaphase
- C) Anaphase
- D) Telophase
- E) Interphase

17. Which type of RNA carries amino acids to the ribosome? 1 p

Mark only one oval.

- A) tRNA
- B) mRNA
- C) rRNA
- D) miRNA
- E) siRNA

18. In DNA, adenine pairs with: 1 p

Mark only one oval.

- A) Guanine
- B) Cytosine
- C) Thymine
- D) Uracil
- E) Adenine

19. Which blood cells are responsible for oxygen transport? 1 p

Mark only one oval.

- A) Leukocytes
- B) Platelets
- C) Erythrocytes
- D) Plasma cells
- E) Monocytes

20. The largest artery in the human body is the: 1 p

Mark only one oval.

- A) Pulmonary artery
- B) Aorta
- C) Femoral artery
- D) Carotid artery
- E) Renal artery

21. The functional unit of the kidney is the: 1 p

Mark only one oval.

- A) Nephron
- B) Glomerulus
- C) Collecting duct
- D) Renal capsule
- E) Loop of Henle

22. The muscle that separates the thoracic and abdominal cavities is the: 1 p

Mark only one oval.

- A) Intercostal muscle
- B) Pectoralis major
- C) Diaphragm
- D) Rectus abdominis
- E) External oblique

23. The bone in the upper arm is the: 1 p

Mark only one oval.

- A) Radius
- B) Ulna
- C) Humerus
- D) Femur
- E) Scapula

24. Which organ filters and cleans blood in the body? 1 p

Mark only one oval.

- A) Heart
- B) Liver
- C) Kidney
- D) Lungs
- E) Pancreas

25. The small sacs in the lungs where gas exchange occurs are called: 1 p

Mark only one oval.

- A) Bronchi
- B) Bronchioles
- C) Alveoli
- D) Pleura
- E) Capillaries

26. Which blood cells are involved in immune defense? 1 p

Mark only one oval.

- A) Red blood cells
- B) White blood cells
- C) Platelets
- D) Chondrocytes
- E) Osteocytes

27. The basic structural and functional unit of the nervous system is the: 1 p

Mark only one oval.

- A) Axon
- B) Neuron
- C) Dendrite
- D) Synapse
- E) Glial cell

28. Which organ secretes insulin? 1 p

Mark only one oval.

- A) Liver
- B) Pancreas
- C) Kidney
- D) Thyroid
- E) Stomach

29. Which part of the digestive system absorbs most nutrients? 1 p

Mark only one oval.

- A) Stomach
- B) Small intestine
- C) Large intestine
- D) Esophagus
- E) Rectum

30. The skull bone that houses the brain is the: 1 p

Mark only one oval.

- A) Mandible
- B) Cranium
- C) Maxilla
- D) Zygomatic bone
- E) Temporal bone

31. Which part of the eye regulates the amount of light entering? 1 p

Mark only one oval.

- A) Cornea
- B) Lens
- C) Retina
- D) Iris
- E) Pupil

32. Which muscle type is voluntary and striated? 1 p

Mark only one oval.

- A) Skeletal
- B) Smooth
- C) Cardiac
- D) Visceral
- E) Elastic

33. Which chamber of the heart pumps oxygenated blood to the body? 1 p

Mark only one oval.

- A) Left atrium
- B) Left ventricle
- C) Right atrium
- D) Right ventricle
- E) Pulmonary artery

34. Which pathogen causes chickenpox? 1 p

Mark only one oval.

- A) Influenza virus
- B) Varicella-zoster virus
- C) Measles virus
- D) Mumps virus
- E) Rubella virus

35. Which nutrient deficiency causes scurvy? 1 p

Mark only one oval.

- A) Vitamin A
- B) Vitamin C
- C) Vitamin D
- D) Vitamin K
- E) Vitamin E

36. Which organ is primarily affected in hepatitis? 1 p

Mark only one oval.

- A) Kidney
- B) Liver
- C) Pancreas
- D) Heart
- E) Lung

37. Which disease is caused by uncontrolled cell division? 1 p

Mark only one oval.

- A) Tuberculosis
- B) Cancer
- C) Diabetes mellitus
- D) Influenza
- E) Malaria

38. Which disease is caused by the HIV virus? 1 p

Mark only one oval.

- A) AIDS
- B) Hepatitis B
- C) Tuberculosis
- D) Influenza
- E) Dengue

39. Which bacterium causes tetanus? 1 p

Mark only one oval.

- A) Clostridium botulinum
- B) Clostridium tetani
- C) Escherichia coli
- D) Salmonella typhi
- E) Neisseria meningitidis

40. Which organ is primarily affected in myocardial infarction? 1 p

Mark only one oval.

- A) Brain
- B) Liver
- C) Heart
- D) Kidney
- E) Lung

41. Which disease is caused by Plasmodium species? 1 p

Mark only one oval.

- A) Tuberculosis
- B) Malaria
- C) Cholera
- D) Typhoid fever
- E) Dengue

42. Which bacterium causes syphilis? 1 p

Mark only one oval.

- A) Treponema pallidum
- B) Neisseria gonorrhoeae
- C) Haemophilus ducreyi
- D) Mycoplasma genitalium
- E) Chlamydia trachomatis

43. Which type of pathogen causes athlete’s foot? 1 p

Mark only one oval.

- A) Virus
- B) Bacterium
- C) Fungus
- D) Protozoan
- E) Helminth

44. Which organelle is primarily responsible for the modification and packaging of proteins for secretion? 1 p

Mark only one oval.

- A) Nucleus
- B) Golgi apparatus
- C) Rough endoplasmic reticulum
- D) Lysosome
- E) Peroxisome

45. A researcher observes a cell with 46 chromosomes in metaphase. How many chromatids are present at this stage? 1 p

Mark only one oval.

- A) 23
- B) 46
- C) 69
- D) 92
- E) 184

46. Which of the following best describes the function of topoisomerase during DNA replication? 1 p

Mark only one oval.

- A) Adds RNA primers
- B) Unwinds the DNA helix
- C) Relieves torsional stress
- D) Joins Okazaki fragments
- E) Synthesizes the leading strand

47. Which mutation is most likely to produce a nonfunctional protein? 1 p

Mark only one oval.

- A) Silent mutation
- B) Missense mutation
- C) Nonsense mutation
- D) Synonymous mutation
- E) Neutral mutation

48. Which statement about the lac operon in E. coli is correct? 1 p

Mark only one oval.

- A) It is activated when glucose is abundant
- B) Lactose acts as a co-repressor
- C) CAP-cAMP complex promotes transcription
- D) The repressor binds lactose directly to activate transcription
- E) It is transcribed only in anaerobic conditions

49. The kinetochore attaches: 1 p

Mark only one oval.

- A) Spindle microtubules to chromosomes
- B) Chromosomes to the nuclear envelope
- C) Centrosomes to centrioles
- D) Sister chromatids to each other
- E) Chromosomes to actin filaments

50. A DNA sequence changes from 5’-ATG TTT CGA-3’ to 5’-ATG TAT CGA-3’. This is an example of: 1 p

Mark only one oval.

- A) Frameshift mutation
- B) Transversion mutation
- C) Transition mutation
- D) Deletion mutation
- E) Duplication mutation

51. Which process occurs in the nucleus of eukaryotic cells but not in prokaryotic cells? 1 p

Mark only one oval.

- A) Translation
- B) Transcription
- C) RNA splicing
- D) DNA replication
- E) RNA polymerase binding

52. In the Hershey-Chase experiment, radioactive phosphorus was used to label: 1 p

Mark only one oval.

- A) Protein
- B) Lipid
- C) Carbohydrate
- D) DNA
- E) RNA

53. The primary function of tRNA is to: 1 p

Mark only one oval.

- A) Synthesize DNA
- B) Carry amino acids to ribosomes
- C) Transcribe RNA from DNA
- D) Join Okazaki fragments
- E) Form ribosomal subunits

54. During glycolysis, the net ATP gain per glucose molecule is: 1 p

Mark only one oval.

- A) 1
- B) 2
- C) 4
- D) 6
- E) 8

55. Which of the following is a purine base? 1 p

Mark only one oval.

- A) Cytosine
- B) Uracil
- C) Thymine
- D) Adenine
- E) None of the above

56. The main function of cyclins in the cell cycle is to: 1 p

Mark only one oval.

- A) Provide energy for mitosis
- B) Activate cyclin-dependent kinases
- C) Degrade spindle microtubules
- D) Regulate ribosomal RNA synthesis
- E) Induce apoptosis

57. Which of the following increases genetic variation during meiosis? 1 p

Mark only one oval.

- A) DNA replication
- B) Crossing over
- C) Cytokinesis
- D) Spindle attachment
- E) Telophase

58. Which enzyme synthesizes the RNA primer in DNA replication? 1 p

Mark only one oval.

- A) Primase
- B) DNA polymerase I
- C) DNA polymerase III
- D) Ligase
- E) Helicase

59. Which structure in eukaryotic cells contains enzymes for fatty acid oxidation? 1 p

Mark only one oval.

- A) Lysosome
- B) Peroxisome
- C) Mitochondrial matrix
- D) Rough ER
- E) Golgi apparatus

60. The wobble hypothesis explains: 1 p

Mark only one oval.

- A) DNA polymerase proofreading
- B) Flexibility in base pairing at the third codon position
- C) ATP synthesis in mitochondria
- D) Synaptic transmission
- E) Chromosome condensation

61. Which chromosome abnormality results from a segment being reversed within the chromosome? 1 p

Mark only one oval.

- A) Deletion
- B) Duplication
- C) Inversion
- D) Translocation
- E) Aneuploidy

62. In a dihybrid cross of heterozygotes, the expected phenotypic ratio is: 1 p

Mark only one oval.

- A) 1:1
- B) 1:2:1
- C) 3:1
- D) 9:3:3:1
- E) 4:4

63. Which molecule is directly produced by the Calvin cycle? 1 p

Mark only one oval.

- A) ATP
- B) NADPH
- C) Glucose
- D) G3P
- E) Pyruvate

64. A nonsense mutation in the coding region of a gene is most likely to: 1 p

Mark only one oval.

- A) Substitute one amino acid for another
- B) Produce a truncated protein
- C) Cause a silent mutation
- D) Cause a frame shift
- E) Increase gene expression

65. The central dogma of molecular biology states that: 1 p

Mark only one oval.

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

66. The sodium-potassium pump moves: 1 p

Mark only one oval.

- A) 3 Na+ out, 2 K+ in
- B) 3 Na+ in, 2 K+ out
- C) 2 Na+ out, 3 K+ in
- D) 2 Na+ in, 2 K+ out
- E) 1 Na+ out, 1 K+ in

67. Which structure is involved in the separation of homologous chromosomes during meiosis I? 1 p

Mark only one oval.

- A) Synaptonemal complex
- B) Centrosome
- C) Nucleolus
- D) Cytokinetic ring
- E) Telomerase

68. Which phase of the cell cycle involves DNA synthesis? 1 p

Mark only one oval.

- A) G0
- B) G1
- C) S
- D) G2
- E) M

69. Which of the following occurs during prophase I of meiosis but not during mitosis? 1 p

Mark only one oval.

- A) Chromosome condensation
- B) Crossing over
- C) Spindle formation
- D) Chromatid separation
- E) DNA replication

70. Which process results in the production of haploid cells from a diploid precursor? 1 p

Mark only one oval.

- A) Mitosis
- B) Binary fission
- C) Meiosis
- D) Fertilization
- E) DNA replication

71. Which RNA type forms the core of the ribosome's catalytic site? 1 p

Mark only one oval.

- A) tRNA
- B) mRNA
- C) rRNA
- D) snRNA
- E) miRNA

72. What is the function of telomerase? 1 p

Mark only one oval.

- A) Repairs DNA mismatches
- B) Extends the ends of linear chromosomes
- C) Splices pre-mRNA
- D) Adds RNA primers
- E) Removes Okazaki fragments

73. In genetic linkage mapping, two genes that are far apart on the same chromosome: 1 p

Mark only one oval.

- A) Never recombine
- B) Recombine more frequently
- C) Recombine less frequently
- D) Are always inherited together
- E) Cannot be mapped

74. Which heart valve prevents backflow of blood from the left ventricle to the left atrium? 1 p

Mark only one oval.

- A) Pulmonary valve
- B) Tricuspid valve
- C) Mitral valve
- D) Aortic valve
- E) Coronary valve

75. The pacemaker cells of the heart are located in the: 1 p

Mark only one oval.

- A) Atrioventricular node
- B) Purkinje fibers
- C) Sinoatrial node
- D) Bundle of His
- E) Left atrium

76. Which hormone increases reabsorption of sodium in the kidneys? 1 p

Mark only one oval.

- A) ADH
- B) Aldosterone
- C) Insulin
- D) Cortisol
- E) Erythropoietin

77. The primary respiratory control center is located in the: 1 p

Mark only one oval.

- A) Thalamus
- B) Cerebellum
- C) Medulla oblongata
- D) Hypothalamus
- E) Midbrain

78. Which blood vessel carries oxygenated blood from the lungs to the heart? 1 p

Mark only one oval.

- A) Pulmonary artery
- B) Pulmonary vein
- C) Aorta
- D) Superior vena cava
- E) Brachiocephalic vein

79. Which type of muscle is involuntary and striated? 1 p

Mark only one oval.

- A) Skeletal muscle
- B) Smooth muscle
- C) Cardiac muscle
- D) Myoepithelial cells
- E) Ligaments

80. Which vitamin is essential for normal blood clotting? 1 p

Mark only one oval.

- A) Vitamin A
- B) Vitamin C
- C) Vitamin D
- D) Vitamin K
- E) Vitamin E

81. Which part of the nephron is primarily responsible for glucose reabsorption? 1 p

Mark only one oval.

- A) Loop of Henle
- B) Proximal convoluted tubule
- C) Distal convoluted tubule
- D) Collecting duct
- E) Bowman's capsule

82. Which region of the brain coordinates voluntary motor activity? 1 p

Mark only one oval.

- A) Cerebellum
- B) Medulla
- C) Thalamus
- D) Hippocampus
- E) Amygdala

83. Which ion is essential for muscle contraction by binding to troponin? 1 p

Mark only one oval.

- A) Sodium
- B) Potassium
- C) Calcium
- D) Magnesium
- E) Chloride

84. The QRS complex of an ECG corresponds to: 1 p

Mark only one oval.

- A) Atrial depolarization
- B) Ventricular depolarization
- C) Ventricular repolarization
- D) Atrial repolarization
- E) SA node firing

85. Which structure increases surface area for absorption in the small intestine? 1 p

Mark only one oval.

- A) Gastric pits
- B) Rugae
- C) Villi
- D) Peyer’s patches
- E) Microglia

86. Which part of the eye contains photoreceptor cells? 1 p

Mark only one oval.

- A) Cornea
- B) Lens
- C) Retina
- D) Sclera
- E) Iris

87. The primary function of hemoglobin is to: 1 p

Mark only one oval.

- A) Buffer blood pH
- B) Transport oxygen
- C) Generate ATP
- D) Store iron
- E) Activate clotting factors

88. Which lobe of the brain is primarily responsible for vision? 1 p

Mark only one oval.

- A) Frontal lobe
- B) Parietal lobe
- C) Temporal lobe
- D) Occipital lobe
- E) Insular cortex

89. Which blood type is considered the universal donor for red blood cells? 1 p

Mark only one oval.

- A) AB+
- B) AB-
- C) O+
- D) O-
- E) A-

90. Which hormone stimulates milk production in the mammary glands? 1 p

Mark only one oval.

- A) Oxytocin
- B) Prolactin
- C) Progesterone
- D) Estrogen
- E) Cortisol

91. Which artery directly supplies blood to the kidneys? 1 p

Mark only one oval.

- A) Femoral artery
- B) Renal artery
- C) Mesenteric artery
- D) Iliac artery
- E) Splenic artery

92. Which structure of the ear is responsible for detecting rotational movement? 1 p

Mark only one oval.

- A) Cochlea
- B) Utricle
- C) Saccule
- D) Semicircular canals
- E) Eustachian tube

93. Which organ produces bile? 1 p

Mark only one oval.

- A) Stomach
- B) Pancreas
- C) Liver
- D) Gallbladder
- E) Duodenum

94. Which structure prevents food from entering the trachea during swallowing? 1 p

Mark only one oval.

- A) Uvula
- B) Epiglottis
- C) Soft palate
- D) Glottis
- E) Larynx

95. Which part of the nephron is the main site for concentration of urine? 1 p

Mark only one oval.

- A) Proximal tubule
- B) Loop of Henle
- C) Distal tubule
- D) Glomerulus
- E) Bowman's capsule

96. Which type of blood vessel has the thickest tunica media? 1 p

Mark only one oval.

- A) Arteries
- B) Veins
- C) Capillaries
- D) Venules
- E) Lymphatic vessels

97. Which neurotransmitter is released at neuromuscular junctions? 1 p

Mark only one oval.

- A) Dopamine
- B) Acetylcholine
- C) Serotonin
- D) GABA
- E) Glutamate

98. Which lung volume represents the amount of air inhaled or exhaled in a normal breath? 1 p

Mark only one oval.

- A) Residual volume
- B) Vital capacity
- C) Tidal volume
- D) Inspiratory reserve volume
- E) Expiratory reserve volume

99. The functional unit of the liver is the: 1 p

Mark only one oval.

- A) Hepatic portal vein
- B) Hepatocyte
- C) Lobule
- D) Sinusoid
- E) Bile canaliculus

100. The hormone calcitonin lowers blood calcium levels by: 1 p

Mark only one oval.

- A) Increasing intestinal calcium absorption
- B) Stimulating osteoclast activity
- C) Inhibiting osteoclast activity
- D) Increasing renal reabsorption of calcium
- E) Promoting vitamin D activation

101. Which cranial nerve is responsible for vision? 1 p

Mark only one oval.

- A) Optic nerve
- B) Oculomotor nerve
- C) Trochlear nerve
- D) Abducens nerve
- E) Trigeminal nerve

102. Which joint type allows the widest range of motion? 1 p

Mark only one oval.

- A) Hinge
- B) Pivot
- C) Ball-and-socket
- D) Saddle
- E) Plane

103. Which chamber of the heart pumps blood into the pulmonary circulation? 1 p

Mark only one oval.

- A) Right atrium
- B) Right ventricle
- C) Left atrium
- D) Left ventricle
- E) Coronary sinus

104. Which microorganism causes tuberculosis? 1 p

Mark only one oval.

- A) Mycobacterium tuberculosis
- B) Streptococcus pneumoniae
- C) Haemophilus influenzae
- D) Bacillus anthracis
- E) Clostridium botulinum

105. Sickle cell anemia results from a mutation affecting: 1 p

Mark only one oval.

- A) Collagen
- B) Hemoglobin
- C) Myosin
- D) Elastin
- E) Actin

106. Which disease is characterized by autoimmune destruction of pancreatic beta cells? 1 p

Mark only one oval.

- A) Type 1 diabetes mellitus
- B) Type 2 diabetes mellitus
- C) Addison’s disease
- D) Graves’ disease
- E) Cushing’s syndrome

107. Which vitamin deficiency causes rickets? 1 p

Mark only one oval.

- A) Vitamin A
- B) Vitamin C
- C) Vitamin D
- D) Vitamin K
- E) Vitamin B12

108. Which disease is caused by deficiency of the enzyme hexosaminidase A? 1 p

Mark only one oval.

- A) Gaucher disease
- B) Niemann–Pick disease
- C) Tay–Sachs disease
- D) Pompe disease
- E) Fabry disease

109. Which pathogen is transmitted via the bite of an Anopheles mosquito? 1 p

Mark only one oval.

- A) Dengue virus
- B) Plasmodium species
- C) Borrelia burgdorferi
- D) Trypanosoma cruzi
- E) Leishmania donovani

110. Which condition is characterized by progressive loss of dopamine-producing neurons in the substantia nigra? 1 p

Mark only one oval.

- A) Alzheimer’s disease
- B) Parkinson’s disease
- C) Huntington’s disease
- D) Amyotrophic lateral sclerosis
- E) Multiple sclerosis

111. Which cancer originates from epithelial tissue? 1 p

Mark only one oval.

- A) Sarcoma
- B) Carcinoma
- C) Lymphoma
- D) Leukemia
- E) Melanoma

112. Which bacterium is the most common cause of peptic ulcers? 1 p

Mark only one oval.

- A) Escherichia coli
- B) Helicobacter pylori
- C) Salmonella typhi
- D) Shigella dysenteriae
- E) Campylobacter jejuni

113. Which disease is associated with the formation of amyloid-beta plaques in the brain? 1 p

Mark only one oval.

- A) Parkinson’s disease
- B) Alzheimer’s disease
- C) Huntington’s disease
- D) Creutzfeldt–Jakob disease
- E) Multiple sclerosis

114. Which sexually transmitted infection is caused by a protozoan? 1 p

Mark only one oval.

- A) Chlamydia
- B) Gonorrhea
- C) Trichomoniasis
- D) Syphilis
- E) Herpes simplex

115. In iron-deficiency anemia, red blood cells are typically: 1 p

Mark only one oval.

- A) Normocytic and normochromic
- B) Microcytic and hypochromic
- C) Macrocytic and normochromic
- D) Microcytic and hyperchromic
- E) Macrocytic and hypochromic

116. Which condition is characterized by hyperthyroidism due to autoantibodies stimulating TSH receptors? 1 p

Mark only one oval.

- A) Hashimoto's thyroiditis
- B) Graves' disease
- C) Addison's disease
- D) Cushing's syndrome
- E) Myxedema

117. Which virus is the primary cause of cervical cancer? 1 p

Mark only one oval.

- A) Hepatitis B virus
- B) Hepatitis C virus
- C) Human papillomavirus
- D) Epstein–Barr virus
- E) Cytomegalovirus

118. Which bacterium is Gram-positive and forms spores? 1 p

Mark only one oval.

- A) Clostridium botulinum
- B) Escherichia coli
- C) Neisseria meningitidis
- D) Pseudomonas aeruginosa
- E) Haemophilus influenzae

119. Which condition involves the accumulation of uric acid crystals in joints? 1 p

Mark only one oval.

- A) Osteoarthritis
- B) Rheumatoid arthritis
- C) Gout
- D) Lupus erythematosus
- E) Ankylosing spondylitis

120. Which infectious disease is targeted by the BCG vaccine? 1 p

Mark only one oval.

- A) Measles
- B) Tuberculosis
- C) Tetanus
- D) Polio
- E) Yellow fever

121. Which genetic disorder is caused by a defect in chloride ion channels? 1 p

Mark only one oval.

- A) Sickle cell anemia
- B) Cystic fibrosis
- C) Duchenne muscular dystrophy
- D) Phenylketonuria
- E) Marfan syndrome

122. Which cancer is strongly associated with chronic hepatitis B or C infection? 1 p

Mark only one oval.

- A) Pancreatic cancer
- B) Hepatocellular carcinoma
- C) Stomach cancer
- D) Colorectal cancer
- E) Lung cancer

123. Which condition results from excessive cortisol production? 1 p

Mark only one oval.

- A) Addison’s disease
- B) Cushing’s syndrome
- C) Graves’ disease
- D) Acromegaly
- E) Hypopituitarism

124. Which type of mutation introduces a premature stop codon? 1 p

Mark only one oval.

- A) Silent mutation
- B) Missense mutation
- C) Nonsense mutation
- D) Frameshift mutation
- E) Insertion mutation

125. In a pedigree, a trait appears in every generation and affects males and females equally. Which inheritance pattern is most likely? 1 p

Mark only one oval.

- A) Autosomal dominant
- B) Autosomal recessive
- C) X-linked recessive
- D) Mitochondrial inheritance
- E) Y-linked inheritance

126. In oxidative phosphorylation, cyanide poisoning inhibits cytochrome c oxidase. This directly prevents: 1 p

Mark only one oval.

- A) Formation of acetyl-CoA
- B) ATP synthesis
- C) NADH production
- D) Glycolysis
- E) CO_2 generation

127. A plant cell placed in a hypertonic solution will: 1 p

Mark only one oval.

- A) Become turgid
- B) Undergo plasmolysis
- C) Swell until bursting
- D) Increase chloroplast activity
- E) Remain unchanged

128. A patient has a deletion removing three nucleotides from the coding region of a gene. Which is most likely? 1 p

Mark only one oval.

- A) Frameshift mutation
- B) Single amino acid deletion
- C) Early stop codon
- D) Loss of entire protein
- E) Gain of function mutation

129. The genetic code is described as “degenerate” because: 1 p

Mark only one oval.

- A) Multiple codons can specify the same amino acid
- B) Codons can code for multiple amino acids
- C) It changes between species
- D) Introns are removed from mRNA
- E) Stop codons have no function

130. Which checkpoint prevents entry into mitosis if DNA is damaged? 1 p

Mark only one oval.

- A) G0 checkpoint
- B) G1 checkpoint
- C) G2 checkpoint
- D) M checkpoint
- E) Cytokinetic checkpoint

131. A DNA fragment has 20% cytosine. What is the adenine content? 1 p

Mark only one oval.

- A) 20%
- B) 30%
- C) 40%
- D) 50%
- E) Cannot be determined

132. Which enzyme removes RNA primers during DNA replication in prokaryotes? 1 p

Mark only one oval.

- A) DNA polymerase I
- B) DNA polymerase III
- C) Ligase
- D) Primase
- E) Helicase

133. The function of the 5′ cap in eukaryotic mRNA is to: 1 p

Mark only one oval.

- A) Promote degradation
- B) Aid in ribosome binding
- C) Terminate transcription
- D) Remove introns
- E) Provide amino acids

134. In the Hershey–Chase experiment, radioactive sulfur labeled: 1 p

Mark only one oval.

- A) DNA
- B) Protein
- C) RNA
- D) Carbohydrate
- E) Lipid

135. In a cross between two heterozygotes for a recessive genetic disorder, what percentage of offspring are expected to be carriers? 1 p

Mark only one oval.

- A) 0%
- B) 25%
- C) 50%
- D) 75%
- E) 100%

136. Which phase of meiosis ensures genetic diversity through independent assortment? 1 p

Mark only one oval.

- A) Prophase I
- B) Metaphase I
- C) Anaphase I
- D) Telophase II
- E) Cytokinesis

137. Which molecule directly donates electrons to the electron transport chain at Complex I? 1 p

Mark only one oval.

- A) $FADH_2$
- B) NADH
- C) ATP
- D) CO_2
- E) Acetyl-CoA

138. Which organelle is most abundant in steroid-producing cells? 1 p

Mark only one oval.

- A) Smooth endoplasmic reticulum
- B) Rough endoplasmic reticulum
- C) Lysosome
- D) Golgi apparatus
- E) Peroxisome

139. During vigorous exercise, blood pH drops. Which physiological response helps restore pH? 1 p

Mark only one oval.

- A) Decreased breathing rate
- B) Increased breathing rate
- C) Increased bicarbonate excretion
- D) Decreased cardiac output
- E) Reduced oxygen delivery

140. In the nephron, most water reabsorption occurs in the: 1 p

Mark only one oval.

- A) Loop of Henle
- B) Collecting duct
- C) Proximal convoluted tubule
- D) Distal convoluted tubule
- E) Bowman's capsule

141. Which structure prevents backflow of blood into the right ventricle? 1 p

Mark only one oval.

- A) Pulmonary valve
- B) Tricuspid valve
- C) Mitral valve
- D) Aortic valve
- E) Coronary valve

142. In skeletal muscle contraction, ATP is required for: 1 p

Mark only one oval.

- A) Troponin binding calcium
- B) Myosin head detachment from actin
- C) Depolarizing the T-tubules
- D) Ca^{2+} release from the sarcoplasmic reticulum
- E) Generating an action potential in the neuron

143. Which hormone is secreted in response to low blood glucose? 1 p

Mark only one oval.

- A) Insulin
- B) Glucagon
- C) Cortisol
- D) Epinephrine
- E) Thyroxine

144. The stretch reflex (e.g., knee-jerk reflex) is classified as: 1 p

Mark only one oval.

- A) Monosynaptic
- B) Disynaptic
- C) Polysynaptic
- D) Inhibitory
- E) Interneuron-based

145. The Bohr effect describes: 1 p

Mark only one oval.

- A) Increased O_2 binding at low CO_2
- B) Decreased O_2 affinity at high CO_2
- C) Increased O_2 affinity at high CO_2
- D) Shift of oxygen dissociation curve left with acidosis
- E) Increased CO_2 binding at low pH

146. The primary pacemaker potential in SA node cells is due to: 1 p

Mark only one oval.

- A) Rapid Na^+ influx
- B) Slow Na^+ influx
- C) Rapid K^+ efflux
- D) Rapid Ca^{2+} influx
- E) Cl^- influx

147. Which brain structure regulates thirst and water balance? 1 p

Mark only one oval.

- A) Cerebellum
- B) Hypothalamus
- C) Medulla
- D) Amygdala
- E) Pons

148. Which component of blood primarily contributes to colloid osmotic pressure? 1 p

Mark only one oval.

- A) Sodium
- B) Albumin
- C) Hemoglobin
- D) Fibrinogen
- E) Glucose

149. The refractory period in cardiac muscle prevents: 1 p

Mark only one oval.

- A) Calcium release
- B) Tetanic contractions
- C) Oxygen binding
- D) Action potential initiation
- E) Heart sounds

150. Which part of the respiratory tract has the smallest cross-sectional area? 1 p

Mark only one oval.

- A) Bronchi
- B) Trachea
- C) Terminal bronchioles
- D) Alveolar ducts
- E) Alveoli

151. Which vitamin is required for calcium absorption in the intestine? 1 p

Mark only one oval.

- A) Vitamin A
- B) Vitamin D
- C) Vitamin E
- D) Vitamin K
- E) Vitamin C

152. Which ion influx triggers synaptic vesicle release at the neuromuscular junction? 1 p

Mark only one oval.

- A) Sodium
- B) Potassium
- C) Calcium
- D) Chloride
- E) Magnesium

153. Which structure drains lymph from most of the body into the venous system? 1 p

Mark only one oval.

- A) Cisterna chyli
- B) Thoracic duct
- C) Right lymphatic duct
- D) Lymph nodes
- E) Lacteals

154. A patient presents with fatigue, pallor, and spoon-shaped nails. Blood smear shows microcytic, hypochromic RBCs. Likely diagnosis? 1 p

Mark only one oval.

- A) Pernicious anemia
- B) Iron-deficiency anemia
- C) Sickle cell anemia
- D) Thalassemia major
- E) Aplastic anemia

155. Which pathogen causes Lyme disease? 1 p

Mark only one oval.

- A) Treponema pallidum
- B) Borrelia burgdorferi
- C) Leptospira interrogans
- D) Rickettsia rickettsii
- E) Yersinia pestis

156. Which type of hypersensitivity reaction is involved in allergic asthma? 1 p

Mark only one oval.

- A) Type I
- B) Type II
- C) Type III
- D) Type IV
- E) Type V

157. A patient with untreated type 1 diabetes is admitted in ketoacidosis. Which biochemical change is most likely? 1 p

Mark only one oval.

- A) Low ketone bodies
- B) High blood pH
- C) Low bicarbonate
- D) Low blood glucose
- E) High insulin

158. Which genetic disorder is due to a defect in fibrillin-1? 1 p

Mark only one oval.

- A) Ehlers–Danlos syndrome
- B) Marfan syndrome
- C) Osteogenesis imperfecta
- D) Huntington's disease
- E) Wilson's disease

159. Which cancer is associated with Helicobacter pylori infection? 1 p

Mark only one oval.

- A) Colon cancer
- B) Gastric adenocarcinoma
- C) Pancreatic cancer
- D) Lung cancer
- E) Hepatic carcinoma

160. Which viral infection can cause a latent infection in neurons leading to shingles later in life? 1 p

Mark only one oval.

- A) Measles virus
- B) Varicella-zoster virus
- C) Epstein–Barr virus
- D) Cytomegalovirus
- E) Poliovirus

161. In pernicious anemia, deficiency of which factor impairs vitamin B12 absorption? 1 p

Mark only one oval.

- A) Intrinsic factor
- B) Extrinsic factor
- C) Gastric acid
- D) Pepsin
- E) Pancreatic enzymes

162. Which parasite is transmitted via undercooked pork and can encyst in muscle? 1 p

Mark only one oval.

- A) Taenia saginata
- B) Trichinella spiralis
- C) Toxoplasma gondii
- D) Ascaris lumbricoides
- E) Entamoeba histolytica