VLYMBOOQ · FULL-LENGTH MOCK PAPER

NEET UG - Paper 1 (Full Paper)

200 questions · 720 marks · 180 minutes

Paper pattern

Exam: NEET UG - Paper 1 (Full Paper)
Questions: 200 Marks: 720 Time: 180 minutes
Negative marking: -1 mark per wrong answer (+4 correct)
Source: NEET UG: 200 questions (180 to be attempted), 720 marks, 180 minutes; 50 each in Physics, Chemistry, Botany, Zoology; +4/-1.
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Note: NEET sets 200 questions and asks candidates to attempt 180. The bank stores biology as one pool, so Botany and Zoology are drawn from it.

Sections

Physics - 50 questions, 180 marks
Chemistry - 50 questions, 180 marks
Botany - 50 questions, 180 marks
Zoology - 50 questions, 180 marks

Instructions

The timer is for practice; the real paper allows 180 minutes.
Each question has exactly one correct option.
Negative marking: -1 mark per wrong answer (+4 correct).
The answer key and a full explanation for every question follow the paper.
Model-generated questions are marked as such in the HTML page; verify any factual detail against the official notification.

Physics

Q1. If the speed of light is 3 × 10 m/s, the distance traveled by light in one year (light year) is approximately:

A. 9.46 × 10^{12} km
B. 9.46 × 10^{12} km
C. 9.46 × 10^{1} km
D. 3 × 108 km

Q2. The internal resistance of an ideal voltmeter is:

A. Zero
B. Low
C. Infinity
D. 1

Q3. A body of mass 5 kg is moving with momentum 20 kg m/s. Its velocity is:

A. 2 m/s
B. 4 m/s
C. 100 m/s
D. 0.25 m/s

Q4. Which of the following has the highest specific heat capacity?

A. Iron
B. Copper
C. Water
D. Lead

Q5. A uniform rod of length L and mass M is pivoted at one end. It is released from a horizontal position. What is the angular acceleration of the rod when it is vertical?

A. 3g/L
B. 2g/L
C. 3g/2L
D. g/L

Q6. A particle moves in a circle of radius 2 m with speed 4 m/s. Its centripetal acceleration is:

A. 2 m/s^2
B. 8 m/s^2
C. 4 m/s^2
D. 16 m/s^2

Q7. The dimensional formula of force is:

A. [MLT]
B. [MLT^2]
C. [MLT^2]
D. [ML^2T^2]

Q8. What is the phenomenon where an electric current generates a magnetic field?

A. Electromagnetic induction
B. Magnetic induction
C. Ampere's law
D. Faraday's law

Q9. A convex lens has a focal length of 20 cm. An object is placed at a distance of 30 cm from the lens. What is the nature and position of the image formed?

A. Real, inverted, 60 cm from the lens on the opposite side.
B. Virtual, erect, 60 cm from the lens on the same side.
C. Real, inverted, 30 cm from the lens on the opposite side.
D. Virtual, erect, 30 cm from the lens on the same side.

Q10. The threshold frequency for a metal is 5 × 10^{1} Hz. Its work function is (h = 6.63 × 10^{3} Js):

A. 3.315 × 10^{1} J
B. 3.315 × 10^{1} J
C. 6.63 × 10^{1} J
D. 1.99 × 10^{1} J

Q11. A convex lens has a focal length of 20 cm. An object is placed at a distance of 30 cm from the lens. What is the nature and position of the image formed?

A. Real, inverted, 60 cm from the lens on the opposite side.
B. Virtual, erect, 60 cm from the lens on the same side.
C. Real, inverted, 30 cm from the lens on the opposite side.
D. Virtual, erect, 30 cm from the lens on the same side.

Q12. When light of frequency is incident on a photocathode, the stopping potential is V. When light of frequency is incident on the same photocathode, the stopping potential is V. If V > V, which of the following relations is correct? (h is Planck's constant, e is the charge of an electron)

A. h(-) = e(V - V)
B. h(-) = e(V - V)
C. h(+) = e(V + V)
D. h(/) = e(V / V)

Q13. A body of mass 5 kg is moving with momentum 20 kg m/s. Its velocity is:

A. 2 m/s
B. 4 m/s
C. 100 m/s
D. 0.25 m/s

Q14. The work done in moving a charge of 5 C across two points with potential difference 10 V is:

A. 2 J
B. 15 J
C. 50 J
D. 5 J

Q15. The coefficient of performance of a refrigerator is given by:

A. Q/W
B. Q/W
C. W/Q
D. (Q-Q)/W

Q16. A body starts from rest and moves with uniform acceleration of 2 m/s^2. The distance covered in 5 seconds is:

A. 10 m
B. 25 m
C. 50 m
D. 5 m

Q17. The dimension of Planck's constant is same as:

A. Energy
B. Angular momentum
C. Force
D. Power

Q18. The energy equivalent of 1 amu is:

A. 931 eV
B. 931 MeV
C. 931 keV
D. 931 J

Q19. What is the nature of the force between two parallel current-carrying conductors?

A. Repulsive
B. Attractive
C. Both attractive and repulsive
D. Neutral

Q20. A convex lens has a focal length of 20 cm. An object is placed at a distance of 30 cm from the lens. What is the nature and position of the image formed?

A. Real, inverted, 60 cm from the lens on the opposite side.
B. Virtual, erect, 60 cm from the lens on the same side.
C. Real, inverted, 30 cm from the lens on the opposite side.
D. Virtual, erect, 30 cm from the lens on the same side.

Q21. A convex lens of focal length 20 cm is placed in contact with a concave lens of focal length 30 cm. The focal length of the combination is:

A.
B.
C.
D.

Q22. A convex mirror always forms which type of image?

A. Real and inverted
B. Virtual and erect
C. Real and erect
D. Virtual and inverted

Q23. Which of the following is a scalar quantity?

A. Force
B. Velocity
C. Energy
D. Acceleration

Q24. The dimensional formula of force is:

A. [MLT]
B. [MLT^2]
C. [MLT^2]
D. [ML^2T^2]

Q25. The reason of mirage in desert is:

A. Reflection
B. Total internal reflection
C. Diffraction
D. Interference

Q26. A convex mirror always forms which type of image?

A. Real and inverted
B. Virtual and erect
C. Real and erect
D. Virtual and inverted

Q27. The energy equivalent of 1 amu is:

A. 931 eV
B. 931 MeV
C. 931 keV
D. 931 J

Q28. The refractive index of a medium is 1.5. Speed of light in this medium is:

A. 3 x 10 m/s
B. 2 x 10 m/s
C. 4.5 x 10 m/s
D. 1.5 x 10 m/s

Q29. A body of mass 2 kg is moving with velocity 3 m/s. Its kinetic energy is:

A. 3 J
B. 9 J
C. 6 J
D. 18 J

Q30. The coefficient of performance of a refrigerator is given by:

A. Q1/W
B. Q2/W
C. W/Q1
D. (Q1-Q2)/W

Q31. Radioactive decay follows which order of kinetics?

A. Zero order
B. First order
C. Second order
D. Third order

Q32. When light of frequency is incident on a photocathode, the stopping potential is V. When light of frequency is incident on the same photocathode, the stopping potential is V. If V > V, which of the following relations is correct? (h is Planck's constant, e is the charge of an electron)

A. h(-) = e(V - V)
B. h(-) = e(V - V)
C. h(+) = e(V + V)
D. h(/) = e(V / V)

Q33. The de Broglie wavelength of an electron accelerated through a potential difference V is given by:

A. h / sqrt(mV)
B. h / sqrt(2meV)
C. h / sqrt(2mVe)
D. h / sqrt(V/2me)

Q34. A particle of mass m is released from rest at a height h above a horizontal surface. If it falls under gravity, and experiences a resistive force proportional to its velocity (F_r = -kv), where k is a positive constant, what is the terminal velocity it approaches?

A. mg/k
B. (2gh)
C. k/mg
D. mgh/k

Q35. A particle of mass 'm' is projected with velocity 'v' at an angle '' with the horizontal. The magnitude of the change in momentum of the particle from the time of projection till it reaches the maximum height is:

A. mv cos
B. mv sin
C.
D.

Q36. A thin uniform ring of mass M and radius R is rotating about an axis perpendicular to its plane and passing through its center with an angular velocity . Two point masses, each of mass m, are gently attached at diametrically opposite points on the ring. The new angular velocity of the system will be:

A. M / (M + 2m)
B. M / (M + m)
C. (M + 2m) / M
D. M / (M + m/2)

Q37. The magnetic field at the center of a current carrying circular loop is:

A. Zero
B. I/2R
C. I/R
D. I/4piR

Q38. What is the phenomenon where the frequency of a wave appears to change when the source and observer are moving relative to each other?

A. Diffraction
B. Refraction
C. Interference
D. Doppler effect

Q39. A particle of mass 'm' is projected with velocity 'v' at an angle '' with the horizontal. The magnitude of the change in momentum of the particle from the time of projection till it reaches the maximum height is:

A. mv cos
B. mv sin
C.
D.

Q40. Which of the following is a scalar quantity?

A. Force
B. Velocity
C. Energy
D. Acceleration

Q41. A body of mass 5 kg is moving with momentum 20 kg m/s. Its velocity is:

A. 2 m/s
B. 4 m/s
C. 100 m/s
D. 0.25 m/s

Q42. A force of 10 N acts on a body of mass 2 kg for 5 s. The impulse is:

A. 10 Ns
B. 50 Ns
C. 2 Ns
D. 25 Ns

Q43. What is the phenomenon where an electric current generates a magnetic field?

A. Electromagnetic induction
B. Magnetic induction
C. Ampere's law
D. Faraday's law

Q44. The phenomenon of splitting of light into its constituent colors is called:

A. Reflection
B. Refraction
C. Dispersion
D. Diffraction

Q45. The SI unit of electric potential is:

A. Coulomb
B. Ohm
C. Volt
D. Ampere

Q46. The internal resistance of an ideal voltmeter is:

A. Zero
B. Low
C. Infinity
D. 1

Q47. Which law states that entropy of an isolated system always increases?

A. First law
B. Second law
C. Third law
D. Zeroth law

Q48. A convex mirror always forms which type of image?

A. Real and inverted
B. Virtual and erect
C. Real and erect
D. Virtual and inverted

Q49. A wire of length L and area A has resistance R. If length is halved and area doubled, new resistance is:

A. R/2
B. R/4
C. R
D. 2R

Q50. A solid cylinder of mass M and radius R rolls without slipping on a horizontal surface with a linear velocity v. The kinetic energy of the cylinder is:

A. (1/2)Mv^2
B. (3/4)Mv^2
C. Mv^2
D. (1/4)Mv^2

Chemistry

Q51. In a redox reaction, oxidation involves:

A. Loss of electrons
B. Gain of electrons
C. Gain of hydrogen
D. Loss of oxygen

Q52. Which of the following is an isotope of hydrogen?

A. Protium
B. Deuterium
C. Tritium
D. All of these

Q53. Which catalyst is used in the Haber process for ammonia synthesis?

A. Vanadium pentoxide
B. Iron
C. Nickel
D. Platinum

Q54. The bond angle in water is approximately:

A. 90 degrees
B. 109.5 degrees
C. 104.5 degrees
D. 120 degrees

Q55. Which of the following reactions will NOT yield an alkyl halide?

A.
B.
C.
D.

Q56. The number of atoms in 1 mole of any substance is:

A. 6.022×10^{23}
B. Avogadro's number
C. 6.022×10^{23}
D. Both A and B

Q57. Which of the following is a noble gas?

A. Hydrogen
B. Nitrogen
C. Argon
D. Chlorine

Q58. The number of atoms in 1 mole of any substance is:

A. 6.022 x 10^2
B. Avogadro's number
C. 6.022 x 10^2
D. Both A and B

Q59. The most stable allotrope of carbon is:

A. Diamond
B. Graphite
C. Fullerene
D. Coal

Q60. For the reaction N2(g) + 3H2(g) = 2NH3(g), the partial pressures at a given instant are P(N2) = 0.2 atm, P(H2) = 0.1 atm and P(NH3) = 0.02 atm. What is the reaction quotient Qp at that instant?

A. 0.25 atm^-2
B. 2.0 atm^-2
C. 10.0 atm^-2
D. 0.05 atm^-2

Q61. Which of the following reagents can be used to distinguish between propanal and propanone?

A. Tollen's reagent
B. Fehling's solution
C. Benedict's solution
D. All of the above

Q62. The number of moles in 11 g of CO2 is:

A. 0.5
B. 0.25
C. 1
D. 2

Q63. The process of electrolysis is based on:

A. Chemical effect of current
B. Magnetic effect of current
C. Redox reactions
D. Heating effect

Q64. Which bond is present in NaCl?

A. Covalent bond
B. Metallic bond
C. Ionic bond
D. Hydrogen bond

Q65. Which of the following statements is INCORRECT regarding the characteristics of physisorption?

A.
B.
C.
D.

Q66. Which of these is a double displacement reaction?

A. 2H + O -> 2H O
B. NaCl + AgNO -> AgCl + NaNO
C. Zn + H SO -> ZnSO + H
D. CaCO -> CaO + CO

Q67. Which of the following reagents would distinguish between ethanal and propanone?

A. Tollen's reagent
B. Fehling's solution
C. Benedict's solution
D. All of the above

Q68. The chemical formula of rust is:

A. FeO
B. Fe_2O_3
C. $Fe_2O_3 \cdot xH_2O$
D. Fe_3O_4

Q69. Which of these is an example of an aromatic compound?

A. Cyclohexane
B. Benzene
C. Cyclohexene
D. 1,3-cyclohexadiene

Q70. The most stable allotrope of carbon is:

A. Diamond
B. Graphite
C. Fullerene
D. Coal

Q71. The correct order of increasing acidic strength for the following compounds is:

A.
B.
C.
D.

Q72. pH scale ranges from:

A. 0 to 7
B. 7 to 14
C. 0 to 14
D. 1 to 10

Q73. Which of these is an example of an aromatic compound?

A. Cyclohexane
B. Benzene
C. Cyclohexene
D. 1,3-cyclohexadiene

Q74. The oxide that turns red litmus blue is:

A. CO
B. SO
C. NaO
D. PO

Q75. The number of oxygen atoms in 1 mole of H_2SO_4 is:

A. $4 \times 6.022 \times 10^{23}$
B. 6.022×10^{23}
C. $2 \times 6.022 \times 10^{23}$
D. $7 \times 6.022 \times 10^{23}$

Q76. What is the type of reaction that involves the loss of electrons by a species?

A. Oxidation reaction
B. Reduction reaction
C. Acid-base reaction
D. Neutralization reaction

Q77. The bond angle in water is approximately:

A. 90°
B. 109.5°
C. 104.5°
D. 120°

Q78. Which gas is produced when zinc reacts with dilute H_2SO_4?

A. Oxygen
B. Chlorine
C. Hydrogen
D. Carbon dioxide

Q79. Which of the following shows paramagnetism?

A. H
B. N
C. O
D. F

Q80. Which quantum number determines the shape of orbital?

A. n
B. l
C. m
D. s

Q81. Which of the following reactions will NOT yield an alkyl halide?

A.
B.
C.
D.

Q82. The shape of NH molecule is:

A. Trigonal planar
B. Trigonal pyramidal
C. Tetrahedral
D. Linear

Q83. What is the type of bond that occurs between two atoms with a large difference in electronegativity?

A. Covalent bond
B. Ionic bond
C. Hydrogen bond
D. Van der Waals bond

Q84. For the reaction N2(g) + 3H2(g) = 2NH3(g), the partial pressures at a given instant are P(N2) = 0.2 atm, P(H2) = 0.1 atm and P(NH3) = 0.02 atm. What is the reaction quotient Qp at that instant?

A. 0.25 atm^-2
B. 2.0 atm^-2
C. 10.0 atm^-2
D. 0.05 atm^-2

Q85. The number of electrons in Na ion is:

A. 11
B. 10
C. 12
D. 9

Q86. Which of the following is a saturated hydrocarbon?

A. C H
B. C H
C. C H
D. C H

Q87. The catalyst used in the contact process for H2SO4 is:

A. V2O5
B. Fe
C. Ni
D. Pt

Q88. The IUPAC name of CHCOOH is:

A. Formic acid
B. Ethanoic acid
C. Acetic acid
D. Methanoic acid

Q89. The process of electrolysis is based on:

A. Chemical effect of current
B. Magnetic effect of current
C. Redox reactions
D. Heating effect

Q90. Which of the following has covalent bonding?

A. NaCl
B. HO
C. KBr
D. CaO

Q91. Which of the following reactions represents a Williamson ether synthesis?

A. R-OH + Na -> R-ONa + 1/2 H
B. R-ONa + R'-X -> R-O-R' + NaX
C. R-OH + HX -> R-X + HO
D. R-CHO + R'-MgBr -> R-CH(OMgBr)-R'

Q92. pH scale ranges from:

A. 0 to 7
B. 7 to 14
C. 0 to 14
D. 1 to 10

Q93. Which of the following shows paramagnetism?

A. H2
B. N2
C. O2
D. F2

Q94. The pH of a neutral solution at 25°C is:

A. 0
B. 7
C. 14
D. 1

Q95. The bond angle in water is approximately:

A. 90 degrees
B. 109.5 degrees
C. 104.5 degrees
D. 120 degrees

Q96. In a redox reaction, oxidation involves:

A. Loss of electrons
B. Gain of electrons
C. Gain of hydrogen
D. Loss of oxygen

Q97. What is the hybridization of the carbon atom in methane?

A. sp
B. sp2
C. sp3
D. sp3d

Q98. Which catalyst is used in the Haber process for ammonia synthesis?

A. Vanadium pentoxide
B. Iron
C. Nickel
D. Platinum

Q99. Which of the following is NOT a polymer?

A. Nylon
B. Cellulose
C. Glucose
D. PVC

Q100. The IUPAC name of CH3COOH is:

A. Formic acid
B. Ethanoic acid
C. Acetic acid
D. Methanoic acid

Botany

Q101. The green pigment in plants that traps sunlight is:

A. Xanthophyll
B. Chlorophyll
C. Carotene
D. Phycobilin

Q102. Which part of the flower becomes fruit?

A. Petal
B. Sepal
C. Ovary
D. Stamen

Q103. What is the primary function of the mitochondria in a cell?

A. Protein synthesis
B. Cell division
C. Energy production
D. Waste removal

Q104. Blood group with no antigens on RBC is:

A. A
B. B
C. AB
D. O

Q105. The process of cell division for growth is:

A. Meiosis
B. Mitosis
C. Binary fission
D. Budding

Q106. The process of cell division for growth is:

A. Meiosis
B. Mitosis
C. Binary fission
D. Budding

Q107. Which of these is a vestigial organ in humans?

A. Liver
B. Heart
C. Appendix
D. Kidney

Q108. The powerhouse of the cell is:

A. Nucleus
B. Ribosome
C. Mitochondria
D. Golgi apparatus

Q109. The process of DNA replication is described as semi-conservative. What does this imply?

A. Each new DNA molecule consists of two entirely new strands.
B. Each new DNA molecule consists of one original strand and one newly synthesized strand.
C. The DNA molecule breaks down completely and reforms into new strands.
D. The replication process is only about 50% efficient.

Q110. Which organelle is involved in protein synthesis?

A. Mitochondria
B. Ribosome
C. Lysosome
D. Golgi body

Q111. The pigment responsible for skin color is:

A. Chlorophyll
B. Haemoglobin
C. Melanin
D. Carotene

Q112. The respiratory pigment in human blood is:

A. Chlorophyll
B. Hemoglobin
C. Melanin
D. Myoglobin

Q113. A person suffers from abnormally high blood glucose levels, frequent urination, and excessive thirst. Which of the following conditions is most likely causing these symptoms?

A. Diabetes insipidus
B. Hypothyroidism
C. Diabetes mellitus
D. Addison's disease

Q114. The universal donor blood group is:

A. A
B. B
C. AB
D. O

Q115. The number of chromosomes in human cells is:

A. 23
B. 46
C. 48
D. 44

Q116. Blood group with no antigens on RBC is:

A. A
B. B
C. AB
D. O

Q117. DNA replication is which type of process?

A. Conservative
B. Semiconservative
C. Dispersive
D. Random

Q118. Which organ is responsible for blood filtration?

A. Liver
B. Kidney
C. Heart
D. Lungs

Q119. Which enzyme breaks down starch in the mouth?

A. Amylase
B. Pepsin
C. Lipase
D. Trypsin

Q120. The enzyme that breaks down proteins in stomach is:

A. Amylase
B. Pepsin
C. Lipase
D. Trypsin

Q121. The longest bone in the human body is:

A. Humerus
B. Femur
C. Tibia
D. Fibula

Q122. Which vitamin is produced in the skin on exposure to sunlight?

A. Vitamin A
B. Vitamin D
C. Vitamin C
D. Vitamin B12

Q123. Which hormone regulates blood sugar level?

A. Thyroxine
B. Insulin
C. Adrenaline
D. Estrogen

Q124. Which organelle is involved in protein synthesis?

A. Mitochondria
B. Ribosome
C. Lysosome
D. Golgi body

Q125. The respiratory pigment in human blood is:

A. Chlorophyll
B. Hemoglobin
C. Melanin
D. Myoglobin

Q126. Which of these is a prokaryote?

A. Amoeba
B. Bacteria
C. Yeast
D. Paramecium

Q127. Which of these is a vestigial organ in humans?

A. Liver
B. Heart
C. Appendix
D. Kidney

Q128. The DNA structure was discovered by:

A. Mendel
B. Darwin
C. Watson and Crick
D. Pasteur

Q129. DNA replication is which type of process?

A. Conservative
B. Semiconservative
C. Dispersive
D. Random

Q130. What is the process by which water moves through a plant, from the roots to the leaves, and is then released into the air as water vapor?

A. Respiration
B. Photosynthesis
C. Transpiration
D. Evaporation

Q131. Which hormone regulates blood sugar level?

A. Thyroxine
B. Insulin
C. Adrenaline
D. Estrogen

Q132. The number of chromosomes in human cells is:

A. 23
B. 46
C. 48
D. 44

Q133. Which part of the brain controls balance and coordination?

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

Q134. The pigment responsible for skin color is:

A. Chlorophyll
B. Haemoglobin
C. Melanin
D. Carotene

Q135. In a DNA double helix, the two strands are joined by hydrogen bonds between the nitrogenous bases. Which of the following statements about these bonds is correct?

A. Adenine forms two hydrogen bonds with Guanine.
B. Thymine forms three hydrogen bonds with Cytosine.
C. Adenine forms two hydrogen bonds with Thymine.
D. Guanine forms two hydrogen bonds with Cytosine.

Q136. A person suffers from abnormally high blood glucose levels, frequent urination, and excessive thirst. Which of the following conditions is most likely causing these symptoms?

A. Diabetes insipidus
B. Hypothyroidism
C. Diabetes mellitus
D. Addison's disease

Q137. Which part of the brain controls balance and coordination?

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

Q138. What is the term for the process by which plants convert light energy into chemical energy?

A. Respiration
B. Photosynthesis
C. Decomposition
D. Fermentation

Q139. Which organ is responsible for blood filtration?

A. Liver
B. Kidney
C. Heart
D. Lungs

Q140. Which vitamin is produced in the skin on exposure to sunlight?

A. Vitamin A
B. Vitamin D
C. Vitamin C
D. Vitamin B12

Q141. The largest gland in the human body is:

A. Pancreas
B. Liver
C. Salivary gland
D. Thyroid

Q142. Which disease is caused by a virus?

A. Cholera
B. Typhoid
C. AIDS
D. Malaria

Q143. The universal donor blood group is:

A. A
B. B
C. AB
D. O

Q144. Which of these is a prokaryote?

A. Amoeba
B. Bacteria
C. Yeast
D. Paramecium

Q145. The enzyme that breaks down proteins in stomach is:

A. Amylase
B. Pepsin
C. Lipase
D. Trypsin

Q146. DNA replication is which type of process?

A. Conservative
B. Semiconservative
C. Dispersive
D. Random

Q147. Which enzyme breaks down starch in the mouth?

A. Amylase
B. Pepsin
C. Lipase
D. Trypsin

Q148. Which chamber of the heart pumps blood to the lungs?

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

Q149. Which disease is caused by a virus?

A. Cholera
B. Typhoid
C. AIDS
D. Malaria

Q150. The smallest bone in the human body is:

A. Femur
B. Stapes
C. Patella
D. Phalanges

Zoology

Q151. Which hormone is called the "fight or flight" hormone?

A. Insulin
B. Adrenaline
C. Thyroxine
D. Estrogen

Q152. What is the term for the process by which water moves through a plant, from the roots to the leaves?

A. Respiration
B. Photosynthesis
C. Transpiration
D. Evaporation

Q153. What is the process by which water moves through a plant, from the roots to the leaves, and is then released into the air as water vapor?

A. Respiration
B. Photosynthesis
C. Transpiration
D. Evaporation

Q154. The largest gland in the human body is:

A. Pancreas
B. Liver
C. Salivary gland
D. Thyroid

Q155. The main function of RBC is:

A. Blood clotting
B. Oxygen transport
C. Immunity
D. Antibody production

Q156. During DNA replication, which enzyme is responsible for synthesizing the new DNA strand by adding nucleotides complementary to the template strand?

A. DNA ligase
B. DNA helicase
C. DNA polymerase
D. Primase

Q157. The green pigment in plants that traps sunlight is:

A. Xanthophyll
B. Chlorophyll
C. Carotene
D. Phycobilin

Q158. The human heart has how many chambers?

A. 2
B. 3
C. 4
D. 5

Q159. What is the term for the process by which plants convert light energy into chemical energy?

A. Respiration
B. Photosynthesis
C. Fermentation
D. Transpiration

Q160. The process of cell division for growth is:

A. Meiosis
B. Mitosis
C. Binary fission
D. Budding

Q161. During DNA replication, which enzyme is responsible for synthesizing the new DNA strand by adding nucleotides complementary to the template strand?

A. DNA ligase
B. DNA helicase
C. DNA polymerase
D. Primase

Q162. The respiratory pigment in human blood is:

A. Chlorophyll
B. Hemoglobin
C. Melanin
D. Myoglobin

Q163. Which vitamin is water soluble?

A. Vitamin A
B. Vitamin D
C. Vitamin C
D. Vitamin K

Q164. Which part of the nephron is impermeable to water but permeable to salts, leading to the dilution of filtrate?

A. Proximal Convoluted Tubule (PCT)
B. Descending limb of Henle's loop
C. Ascending limb of Henle's loop
D. Distal Convoluted Tubule (DCT)

Q165. The number of chromosomes in human cells is:

A. 23
B. 46
C. 48
D. 44

Q166. Which hormone regulates blood sugar level?

A. Thyroxine
B. Insulin
C. Adrenaline
D. Estrogen

Q167. Which hormone is called the "fight or flight" hormone?

A. Insulin
B. Adrenaline
C. Thyroxine
D. Estrogen

Q168. Which enzyme breaks down starch in the mouth?

A. Amylase
B. Pepsin
C. Lipase
D. Trypsin

Q169. Which vitamin is water soluble?

A. Vitamin A
B. Vitamin D
C. Vitamin C
D. Vitamin K

Q170. Which hormone is called the "fight or flight" hormone?

A. Insulin
B. Adrenaline
C. Thyroxine
D. Estrogen

Q171. The pigment responsible for skin color is:

A. Chlorophyll
B. Haemoglobin
C. Melanin
D. Carotene

Q172. The number of chromosomes in human cells is:

A. 23
B. 46
C. 48
D. 44

Q173. The disease caused by deficiency of insulin is:

A. Goiter
B. Diabetes mellitus
C. Anemia
D. Rickets

Q174. The enzyme that breaks down proteins in stomach is:

A. Amylase
B. Pepsin
C. Lipase
D. Trypsin

Q175. Which of the following hormones is secreted by the anterior pituitary gland?

A. Antidiuretic hormone (ADH)
B. Oxytocin
C. Growth hormone (GH)
D. Melatonin

Q176. Which of the following is a primary lymphoid organ where B-lymphocytes mature?

A.
B.
C.
D.

Q177. What is the term for the process by which an organism's genetic information is used to synthesize proteins and other molecules in response to environmental stimuli?

A. Hereditary
B. Genetic drift
C. Gene expression
D. Cell division

Q178. Which organelle is involved in protein synthesis?

A. Mitochondria
B. Ribosome
C. Lysosome
D. Golgi body

Q179. Which enzyme breaks down starch in the mouth?

A. Amylase
B. Pepsin
C. Lipase
D. Trypsin

Q180. The disease caused by deficiency of insulin is:

A. Goiter
B. Diabetes mellitus
C. Anemia
D. Rickets

Q181. Which of the following characteristics is unique to mammals among vertebrates?

A. Presence of a three-chambered heart
B. Feathers for flight
C. Production of milk by mammary glands
D. Cold-blooded metabolism

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Q182. Which of the following pairs represents a correct match between an animal phylum and a characteristic feature?

A. Porifera - Presence of true tissues
B. Cnidaria - Radial symmetry and cnidocytes
C. Annelida - Segmented body with jointed appendages
D. Arthropoda - Soft unsegmented body

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Q183. Which of the following blood cells plays the most critical role in the immune response by engulfing pathogens?

A. Erythrocytes
B. Thrombocytes
C. Neutrophils
D. Plasma proteins

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Q184. Which of the following structures is NOT part of the human male reproductive system?

A. Seminal Vesicle
B. Ovary
C. Prostate Gland
D. Epididymis

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Q185. Which of the following blood groups is considered the universal donor for red blood cell transfusions?

A. A+
B. B-
C. AB+
D. O-

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Q186. Which of the following structures in the human heart is responsible for preventing the backflow of blood from the left ventricle to the left atrium during systole?

A. Tricuspid valve
B. Mitral (bicuspid) valve
C. Pulmonary semilunar valve
D. Aortic semilunar valve

Model-generated · 2026-11-07

Q187. In the context of plant physiology, which hormone is primarily responsible for promoting cell elongation and stem growth?

A. Abscisic acid
B. Gibberellins
C. Cytokinins
D. Ethylene

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Q188. The evolutionary trend towards the development of wings in birds and bats is an example of:

A. Homology
B. Analogy (Convergent Evolution)
C. Vestigiality
D. Genetic Drift

Model-generated · 2026-11-07

Q189. The process by which ammonia produced from amino acid deamination is converted into urea in the liver is an example of:

A. Glycolysis
B. Urea Cycle
C. Krebs Cycle
D. Electron Transport Chain

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Q190. Which of the following organisms exhibits metamorphosis during its life cycle?

A. Frog
B. Earthworm
C. Penguin
D. Jellyfish

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Q191. Which of the following organisms exhibits a life cycle with distinct larval and adult stages involving metamorphosis?

A. Earthworm
B. Frog
C. Snake
D. Shark

Model-generated · 2026-11-07

Q192. Which of the following structures in a neuron is primarily responsible for receiving signals from other neurons or sensory receptors?

A. Axon
B. Dendrite
C. Myelin sheath

D. Node of Ranvier
Model-generated · 2026-11-07

Q193. Which of the following structures in the human ear is directly responsible for converting sound vibrations into electrical signals sent to the brain?

A. Tympanic membrane
B. Ossicles
C. Organ of Corti
D. Semicircular canals
Model-generated · 2026-11-07

Q194. What is the primary function of the stomata found on the epidermis of plant leaves?

A. Gas exchange and transpiration
B. Photosynthesis only
C. Water absorption from soil
D. Defense against herbivores
Model-generated · 2026-11-07

Q195. Which of the following hormones acts as a counter-regulatory hormone to insulin by raising blood glucose levels?

A. Insulin
B. Glucagon
C. Thyroxine
D. Melatonin
Model-generated · 2026-11-07

Q196. In birds, the presence of a four-chambered heart is an adaptation that supports which physiological requirement?

A. Cold-blooded metabolism
B. Low oxygen demand
C. High metabolic rate and endothermy
D. Aquatic respiration
Model-generated · 2026-11-07

Q197. The presence of a diaphragm is a defining characteristic of which group of animals?

A. Reptiles
B. Birds
C. Mammals
D. Amphibians
Model-generated · 2026-11-07

Q198. The process by which water evaporates from the leaves of a plant, creating a suction force that pulls water up from the roots, is called:

A. Translocation
B. Photosynthesis
C. Transpiration
D. Osmosis
Model-generated · 2026-11-07

Q199. In humans, the primary function of the thymus gland during childhood is:

A. Production of insulin
B. Maturation of T-lymphocytes
C. Secretion of adrenaline
D. Regulation of blood calcium levels
Model-generated · 2026-11-07

Q200. In the human circulatory system, which component of the blood is primarily responsible for clotting?

A. Red Blood Cells
B. White Blood Cells
C. Platelets
D. Plasma
Model-generated · 2026-11-07

Answer key

Q1 B	Q2 C	Q3 B	Q4 C
Q5 C	Q6 B	Q7 C	Q8 C
Q9 A	Q10 B	Q11 A	Q12 A
Q13 B	Q14 C	Q15 B	Q16 B
Q17 B	Q18 B	Q19 C	Q20 A
Q21 C	Q22 B	Q23 C	Q24 C
Q25 B	Q26 B	Q27 B	Q28 B
Q29 B	Q30 B	Q31 B	Q32 A
Q33 B	Q34 A	Q35 B	Q36 A
Q37 B	Q38 D	Q39 B	Q40 C
Q41 B	Q42 B	Q43 C	Q44 C
Q45 C	Q46 C	Q47 B	Q48 B
Q49 B	Q50 B	Q51 A	Q52 D
Q53 B	Q54 C	Q55 D	Q56 B
Q57 C	Q58 B	Q59 B	Q60 B
Q61 D	Q62 B	Q63 C	Q64 C
Q65 C	Q66 B	Q67 D	Q68 C
Q69 B	Q70 B	Q71 B	Q72 C
Q73 B	Q74 C	Q75 A	Q76 A
Q77 C	Q78 C	Q79 C	Q80 B
Q81 D	Q82 B	Q83 B	Q84 B
Q85 B	Q86 B	Q87 A	Q88 B
Q89 C	Q90 B	Q91 B	Q92 C
Q93 C	Q94 B	Q95 C	Q96 A
Q97 C	Q98 B	Q99 C	Q100 B
Q101 B	Q102 C	Q103 C	Q104 D
Q105 B	Q106 B	Q107 C	Q108 C
Q109 B	Q110 B	Q111 C	Q112 B
Q113 C	Q114 D	Q115 B	Q116 D
Q117 B	Q118 B	Q119 A	Q120 B
Q121 B	Q122 B	Q123 B	Q124 B
Q125 B	Q126 B	Q127 C	Q128 C
Q129 B	Q130 C	Q131 B	Q132 B
Q133 B	Q134 C	Q135 C	Q136 C
Q137 B	Q138 B	Q139 B	Q140 B
Q141 B	Q142 C	Q143 D	Q144 B
Q145 B	Q146 B	Q147 A	Q148 D
Q149 C	Q150 B	Q151 B	Q152 C
Q153 C	Q154 B	Q155 B	Q156 C
Q157 B	Q158 C	Q159 B	Q160 B
Q161 C	Q162 B	Q163 C	Q164 C
Q165 B	Q166 B	Q167 B	Q168 A
Q169 C	Q170 B	Q171 C	Q172 B
Q173 B	Q174 B	Q175 C	Q176 C
Q177 C	Q178 B	Q179 A	Q180 B

Q181 C	**Q182 B**	**Q183 C**	**Q184 B**
Q185 D	**Q186 B**	**Q187 B**	**Q188 B**
Q189 B	**Q190 A**	**Q191 B**	**Q192 B**
Q193 C	**Q194 A**	**Q195 B**	**Q196 C**
Q197 C	**Q198 C**	**Q199 B**	**Q200 C**

Solutions and explanations

Q1. If the speed of light is 3 × 10 m/s, the distance traveled by light in one year (light year) is approximately:
Answer: B
1 light year = 9.46 × 10^{12} km.

Q2. The internal resistance of an ideal voltmeter is:
Answer: C
Ideal voltmeter has infinite resistance to draw zero current.

Q3. A body of mass 5 kg is moving with momentum 20 kg m/s. Its velocity is:
Answer: B
v = p/m = 20/5 = 4 m/s.

Q4. Which of the following has the highest specific heat capacity?
Answer: C
Water has the highest specific heat capacity (4200 J/kg degrees C) among common substances.

Q5. A uniform rod of length L and mass M is pivoted at one end. It is released from a horizontal position. What is the angular acceleration of the rod when it is vertical?
Answer: C
The moment of inertia of a rod about one end is I = (1/3)ML^2. The torque due to gravity when the rod is vertical is = Mg(L/2). Using Newton's second law for rotation, = I, we get Mg(L/2) = (1/3)ML^2. Solving for , we get = 3g/2L.

Q6. A particle moves in a circle of radius 2 m with speed 4 m/s. Its centripetal acceleration is:
Answer: B
a_c = v^2/r = 16/2 = 8 m/s^2.

Q7. The dimensional formula of force is:
Answer: C
F = ma -> [F] = [M][LT^2] = [MLT^2].

Q8. What is the phenomenon where an electric current generates a magnetic field?
Answer: C
Ampere's law states that an electric current generates a magnetic field, and the direction of the magnetic field can be determined by the right-hand rule.

Q9. A convex lens has a focal length of 20 cm. An object is placed at a distance of 30 cm from the lens. What is the nature and position of the image formed?
Answer: A
Using the lens formula 1/f = 1/v - 1/u, where f = 20 cm and u = -30 cm (object distance is negative). 1/20 = 1/v - 1/(-30) => 1/v = 1/20 - 1/30 = (3-2)/60 = 1/60. So, v = 60 cm. Since v is positive, the image is real and formed on the opposite side. The magnification m = v/u = 60/(-30) = -2, indicating an inverted image.

Q10. The threshold frequency for a metal is 5 × 10^{1} Hz. Its work function is (h = 6.63 × 10 ^{3} Js):
Answer: B
f = hf0 = 6.63×10 ^{3} × 5 × 10^{1} = 3.315×10 ^{1} J.

Q11. A convex lens has a focal length of 20 cm. An object is placed at a distance of 30 cm from the lens. What is the nature and position of the image formed?
Answer: A
Using the lens formula 1/f = 1/v - 1/u, where f = 20 cm and u = -30 cm (object distance is negative). 1/20 = 1/v - 1/(-30) => 1/v = 1/20 - 1/30 = (3-2)/60 = 1/60. So, v = 60 cm. Since v is positive, the image is real and formed on the opposite side. The magnification m = v/u = 60/(-30) = -2, indicating an inverted image.

Q12. When light of frequency is incident on a photocathode, the stopping potential is V. When light of frequency is incident on the same photocathode, the stopping potential is V. If V > V, which of the following relations is correct? (h is Planck's constant, e is the charge of an electron)
Answer: A
According to Einstein's photoelectric equation, the maximum kinetic energy of emitted photoelectrons (KE_max) is given by: h = + KE_max where h is Planck's constant, is the frequency of incident light, and is the work function of the metal. The stopping potential (V_s) is related to KE_max by: KE_max = eV_s So, the equation becomes: h = + eV_s For the first case: h = + eV (Equation 1) For the second case: h = + eV (Equation 2) Subtract Equation 1 from Equation 2: (h - h) = (+ eV) - (+ eV) h(-) = eV - eV h(-) = e(V - V)

Q13. A body of mass 5 kg is moving with momentum 20 kg m/s. Its velocity is:
Answer: B
v = p/m = 20/5 = 4 m/s.

Q14. The work done in moving a charge of 5 C across two points with potential difference 10 V is:
Answer: C
W = QV = 5 × 10 = 50 J.

Q15. The coefficient of performance of a refrigerator is given by:
Answer: B
COP = Q/W where Q is heat extracted from cold reservoir and W is work input.

Q16. A body starts from rest and moves with uniform acceleration of 2 m/s². The distance covered in 5 seconds is:
Answer: B
s = ut + ½at² = 0 + ½ × 2 × 25 = 25 m.

Q17. The dimension of Planck's constant is same as:
Answer: B
h = E/ -> [ML^2T] same as angular momentum.

Q18. The energy equivalent of 1 amu is:
Answer: B
1 amu = 931.5 MeV/c^2.

Q19. What is the nature of the force between two parallel current-carrying conductors?
Answer: C
The force between two parallel current-carrying conductors can be either attractive or repulsive, depending on the direction of the current flow.

Q20. A convex lens has a focal length of 20 cm. An object is placed at a distance of 30 cm from the lens. What is the nature and position of the image formed?
Answer: A
Using the lens formula 1/f = 1/v - 1/u, where f = 20 cm and u = -30 cm (object distance is negative). 1/20 = 1/v - 1/(-30) => 1/v = 1/20 - 1/30 = (3-2)/60 = 1/60. So, v = 60 cm. Since v is positive, the image is real and formed on the opposite side. The magnification m = v/u = 60/(-30) = -2, indicating an inverted image.

Q21. A convex lens of focal length 20 cm is placed in contact with a concave lens of focal length 30 cm. The focal length of the combination is:
Answer: C
For a combination of thin lenses in contact, the reciprocal of the equivalent focal length (F) is given by 1/F = 1/f + 1/f. Given f = +20 cm (convex lens) and f = -30 cm (concave lens). So, 1/F = 1/20 + 1/(-30) = 1/20 - 1/30. To combine, find a common denominator, which is 60. 1/F = (3/60) - (2/60) = 1/60. Therefore, F = +60 cm.

Q22. A convex mirror always forms which type of image?
Answer: B
Convex mirrors always form virtual, erect, and diminished images regardless of object position.

Q23. Which of the following is a scalar quantity?
Answer: C
Energy has magnitude only (no direction), hence scalar. Force, velocity, acceleration are vectors.

Q24. The dimensional formula of force is:
Answer: C
F = ma -> [F] = [M][LT^2] = [MLT^2].

Q25. The reason of mirage in desert is:
Answer: B
Mirage occurs due to total internal reflection of light in layers of different refractive indices.

Q26. A convex mirror always forms which type of image?
Answer: B
Convex mirrors always form virtual, erect, and diminished images regardless of object position.

Q27. The energy equivalent of 1 amu is:
Answer: B
1 amu = 931.5 MeV/c^2.

Q28. The refractive index of a medium is 1.5. Speed of light in this medium is:
Answer: B
v = c/n = 3x10/1.5 = 2x10 m/s.

Q29. A body of mass 2 kg is moving with velocity 3 m/s. Its kinetic energy is:
Answer: B
KE = ½mv² = ½ × 2 × 9 = 9 J.

Q30. The coefficient of performance of a refrigerator is given by:
Answer: B
COP = Q2/W where Q2 is heat extracted from cold reservoir and W is work input.

Q31. Radioactive decay follows which order of kinetics?
Answer: B
Radioactive decay follows first order kinetics: N = N0e???.

Q32. When light of frequency is incident on a photocathode, the stopping potential is V. When light of frequency is incident on the same photocathode, the stopping potential is V. If V > V, which of the following relations is correct? (h is Planck's constant, e is the charge of an electron)

Answer: A

According to Einstein's photoelectric equation, the maximum kinetic energy of emitted photoelectrons (KE_max) is given by: h = + KE_max where h is Planck's constant, is the frequency of incident light, and is the work function of the metal. The stopping potential (V_s) is related to KE_max by: KE_max = eV_s So, the equation becomes: h = + eV_s For the first case: h = + eV (Equation 1) For the second case: h = + eV (Equation 2) Subtract Equation 1 from Equation 2: (h - h) = (+ eV) - (+ eV) h(-) = eV - eV h(-) = e(V - V)

Q33. The de Broglie wavelength of an electron accelerated through a potential difference V is given by:

Answer: B

When an electron is accelerated through a potential difference V, it gains kinetic energy KE = eV. The kinetic energy is also given by KE = p^2 / 2m, where p is the momentum and m is the mass of the electron. Therefore, p = sqrt(2mKE) = sqrt(2meV). The de Broglie wavelength is given by = h/p. Substituting the expression for p, we get = h / sqrt(2meV).

Q34. A particle of mass m is released from rest at a height h above a horizontal surface. If it falls under gravity, and experiences a resistive force proportional to its velocity (F_r = -kv), where k is a positive constant, what is the terminal velocity it approaches?

Answer: A

Terminal velocity is reached when the net force on the particle is zero. The forces acting on the particle are gravity (mg downwards) and the resistive force (-kv upwards). Thus, mg - kv_t = 0, which gives v_t = mg/k.

Q35. A particle of mass 'm' is projected with velocity 'v' at an angle '' with the horizontal. The magnitude of the change in momentum of the particle from the time of projection till it reaches the maximum height is:

Answer: B

At the time of projection, the momentum components are Px = mv cos (horizontal) and Py = mv sin (vertical). At the maximum height, the vertical component of velocity becomes zero, so the vertical component of momentum is zero. The horizontal component of momentum remains mv cos. Change in momentum (P) = Final momentum - Initial momentum. P_x = mv cos - mv cos = 0. P_y = 0 - mv sin = -mv sin. The magnitude of the change in momentum is |P_y| = mv sin.

Q36. A thin uniform ring of mass M and radius R is rotating about an axis perpendicular to its plane and passing through its center with an angular velocity . Two point masses, each of mass m, are gently attached at diametrically opposite points on the ring. The new angular velocity of the system will be:

Answer: A

According to the principle of conservation of angular momentum:Initial angular momentum (L_initial) = I_initial * For the ring, I_initial = MR^2So, L_initial = MR^2When two point masses 'm' are attached at diametrically opposite points, the new moment of inertia (I_final) will be:I_final = I_ring + I_two_point_masses = MR^2 + mR^2 + mR^2 = (M + 2m)R^2Let the new angular velocity be '.Final angular momentum (L_final) = I_final * ' = (M + 2m)R^2'Equating initial and final angular momentum:MR^2 = (M + 2m)R^2'' = MR^2 / ((M + 2m)R^2)' = M / (M + 2m)

Q37. The magnetic field at the center of a current carrying circular loop is:

Answer: B

B = I/(2R) at center of circular loop.

Q38. What is the phenomenon where the frequency of a wave appears to change when the source and observer are moving relative to each other?

Answer: D

The Doppler effect is the phenomenon where the frequency of a wave appears to change when the source and observer are moving relative to each other. This effect is commonly observed in sound waves and light waves.

Q39. A particle of mass 'm' is projected with velocity 'v' at an angle '' with the horizontal. The magnitude of the change in momentum of the particle from the time of projection till it reaches the maximum height is:

Answer: B

At the time of projection, the momentum components are Px = mv cos (horizontal) and Py = mv sin (vertical). At the maximum height, the vertical component of velocity becomes zero, so the vertical component of momentum is zero. The horizontal component of momentum remains mv cos. Change in momentum (P) = Final momentum - Initial momentum. P_x = mv cos - mv cos = 0. P_y = 0 - mv sin = -mv sin. The magnitude of the change in momentum is |P_y| = mv sin.

Q40. Which of the following is a scalar quantity?

Answer: C

Energy has magnitude only (no direction), hence scalar. Force, velocity, acceleration are vectors.

Q41. A body of mass 5 kg is moving with momentum 20 kg m/s. Its velocity is:

Answer: B

v = p/m = 20/5 = 4 m/s.

Q42. A force of 10 N acts on a body of mass 2 kg for 5 s. The impulse is:

Answer: B

Impulse = F × t = 10 × 5 = 50 Ns.

Q43. What is the phenomenon where an electric current generates a magnetic field?
Answer: C
Ampere's law states that an electric current generates a magnetic field, and the direction of the magnetic field can be determined by the right-hand rule.

Q44. The phenomenon of splitting of light into its constituent colors is called:
Answer: C
Dispersion splits white light into VIBGYOR colors (e.g., rainbow).

Q45. The SI unit of electric potential is:
Answer: C
Electric potential is measured in Volts (V = J/C).

Q46. The internal resistance of an ideal voltmeter is:
Answer: C
Ideal voltmeter has infinite resistance to draw zero current.

Q47. Which law states that entropy of an isolated system always increases?
Answer: B
Second law: entropy of isolated system always increases (S 0).

Q48. A convex mirror always forms which type of image?
Answer: B
Convex mirrors always form virtual, erect, and diminished images regardless of object position.

Q49. A wire of length L and area A has resistance R. If length is halved and area doubled, new resistance is:
Answer: B
R' = (L/2)/(2A) = (L/A)/4 = R/4.

Q50. A solid cylinder of mass M and radius R rolls without slipping on a horizontal surface with a linear velocity v. The kinetic energy of the cylinder is:
Answer: B
The total kinetic energy (KE_total) of a body rolling without slipping is the sum of its translational kinetic energy (KE_translational) and rotational kinetic energy (KE_rotational). KE_total = KE_translational + KE_rotational KE_translational = (1/2)Mv^2 KE_rotational = (1/2)I^2 For a solid cylinder, the moment of inertia I = (1/2)MR^2. For rolling without slipping, the linear velocity v and angular velocity are related by v = R, so = v/R. Substituting these into the rotational kinetic energy equation: KE_rotational = (1/2) * ((1/2)MR^2) * (v/R)^2 KE_rotational = (1/4)MR^2 * (v^2/R^2) KE_rotational = (1/4)Mv^2 Now, sum the translational and rotational kinetic energies: KE_total = (1/2)Mv^2 + (1/4)Mv^2 KE_total = (2/4)Mv^2 + (1/4)Mv^2 KE_total = (3/4)Mv^2

Q51. In a redox reaction, oxidation involves:
Answer: A
Oxidation = loss of electrons, Reduction = gain of electrons (OIL RIG).

Q52. Which of the following is an isotope of hydrogen?
Answer: D
Protium (^{1}H), Deuterium (^{2}H), and Tritium (^{3}H) are all isotopes of hydrogen.

Q53. Which catalyst is used in the Haber process for ammonia synthesis?
Answer: B
Haber process uses finely divided iron with promoters (K O, Al O) as catalyst.

Q54. The bond angle in water is approximately:
Answer: C
Water has bent shape with 104.5 degrees angle due to lone pair repulsion.

Q55. Which of the following reactions will NOT yield an alkyl halide?
Answer: D
Reaction A (Lucas test) yields CHCHCl. Reaction B (free radical halogenation) yields CHCH(Cl)CH and CHCHCHCl. Reaction C (hydrohalogenation of propene, Markovnikov's rule) yields CHCH(Br)CH. Reaction D (reaction of carboxylic acid with PCl) yields an acyl chloride (CHCHCOCl), not an alkyl halide.

Q56. The number of atoms in 1 mole of any substance is:
Answer: B
1 mole = 6.022×10^{23} particles = Avogadro's number.

Q57. Which of the following is a noble gas?
Answer: C
Argon (Ar) is a noble gas in Group 18 with a full valence shell.

Q58. The number of atoms in 1 mole of any substance is:
Answer: B
1 mole = 6.022 x 10^2 particles = Avogadro's number.

Q59. The most stable allotrope of carbon is:
Answer: B
Graphite is the most stable allotrope of carbon at room temperature.

Q60. For the reaction N2(g) + 3H2(g) = 2NH3(g), the partial pressures at a given instant are P(N2) = 0.2 atm, P(H2) = 0.1 atm and P(NH3) = 0.02 atm. What is the reaction quotient Qp at that instant?
Answer: B
Qp = P(NH3)^2 / [P(N2) x P(H2)^3] = (0.02)^2 / (0.2 x 0.1^3) = 0.0004 / 0.0002 = 2.0 atm^-2. Option B is correct.

Q61. Which of the following reagents can be used to distinguish between propanal and propanone?
Answer: D
Propanal is an aldehyde (CHCHCHO), and propanone is a ketone (CHCOCH). Aldehydes are generally more easily oxidized than ketones. They can reduce mild oxidizing agents, while ketones typically cannot (except under harsh conditions or specific structural features like alpha-hydroxy ketones). 1. **Tollen's reagent (ammoniacal silver nitrate):** Aldehydes reduce Tollen's reagent to metallic silver, forming a 'silver mirror' on the test tube. Ketones do not react. 2. **Fehling's solution (alkaline solution of copper(II) sulfate complexed with tartrate):** Aldehydes reduce the blue Cu^2 ions to red precipitate of cuprous oxide (CuO). Ketones do not react. 3. **Benedict's solution (alkaline solution of copper(II) sulfate complexed with citrate):** Similar to Fehling's solution, aldehydes reduce the blue Cu^2 ions to red precipitate of cuprous oxide. Ketones do not react. Since propanal (an aldehyde) will give a positive test with all three reagents, while propanone (a ketone) will not, all of them can be used to distinguish between the two compounds.

Q62. The number of moles in 11 g of CO2 is:
Answer: B
Molar mass CO2 = 44 g/mol. n = 11/44 = 0.25.

Q63. The process of electrolysis is based on:
Answer: C
Electrolysis involves redox reactions at electrodes driven by electric current.

Q64. Which bond is present in NaCl?
Answer: C
NaCl forms an ionic bond between Na and Cl through electron transfer.

Q65. Which of the following statements is INCORRECT regarding the characteristics of physisorption?
Answer: C
Physisorption is non-specific in nature because it occurs due to weak van der Waals forces which are universal. Chemisorption, on the other hand, is highly specific and involves the formation of chemical bonds between adsorbate and adsorbent.

Q66. Which of these is a double displacement reaction?
Answer: B
Double displacement: two compounds exchange ions -> new compounds.

Q67. Which of the following reagents would distinguish between ethanal and propanone?
Answer: D
Ethanal (CH3CHO) is an aldehyde, while propanone (CH3COCH3) is a ketone. Aldehydes can be easily oxidized to carboxylic acids by mild oxidizing agents, whereas ketones are generally resistant to oxidation by mild agents. Tollen's reagent (ammoniacal silver nitrate), Fehling's solution (alkaline solution of CuSO4 and sodium potassium tartrate), and Benedict's solution (alkaline solution of CuSO4 and sodium citrate) are all mild oxidizing agents used to detect aldehydes.Ethanal, being an aldehyde, will give a positive test with Tollen's reagent (forming a silver mirror), Fehling's solution (forming a red precipitate of Cu2O), and Benedict's solution (forming a red precipitate of Cu2O).Propanone, being a ketone, will not react with any of these mild oxidizing agents.Therefore, all the listed reagents can distinguish between ethanal and propanone.

Q68. The chemical formula of rust is:
Answer: C
Rust is hydrated iron(III) oxide, Fe2O3·xH2O.

Q69. Which of these is an example of an aromatic compound?
Answer: B
Benzene (C6H6) is aromatic with delocalized 6p electrons.

Q70. The most stable allotrope of carbon is:
Answer: B
Graphite is the most stable allotrope of carbon at room temperature.

Q71. The correct order of increasing acidic strength for the following compounds is:
Answer: B
Ethanol is a very weak acid. Phenol is more acidic than ethanol due to resonance stabilization of the phenoxide ion. Acetic acid is a carboxylic acid, much stronger than phenol. Chloroacetic acid is more acidic than acetic acid due to the electron-withdrawing inductive effect (-I effect) of the chlorine atom, which stabilizes the carboxylate anion further. Therefore, the order is Ethanol < Phenol < Acetic acid < Chloroacetic acid.

Q72. pH scale ranges from:
Answer: C
pH scale ranges 0-14 (0-6 acidic, 7 neutral, 8-14 basic).

Q73. Which of these is an example of an aromatic compound?
Answer: B
Benzene (CH) is aromatic with delocalized 6pi electrons.

Q74. The oxide that turns red litmus blue is:
Answer: C
NaO is basic oxide -> turns red litmus blue. CO, SO, PO are acidic.

Q75. The number of oxygen atoms in 1 mole of H2SO4 is:
Answer: A
1 molecule of H2SO4 has 4 O atoms. 1 mole has 4 × NA = 4 × 6.022 × 10^{23} atoms.

Q76. What is the type of reaction that involves the loss of electrons by a species?
Answer: A
An oxidation reaction is a type of reaction that involves the loss of electrons by a species.

Q77. The bond angle in water is approximately:
Answer: C
Water has bent shape with 104.5° angle due to lone pair repulsion.

Q78. Which gas is produced when zinc reacts with dilute H2SO4?
Answer: C
Zn + H2SO4 -> ZnSO4 + H2 . Hydrogen gas is produced.

Q79. Which of the following shows paramagnetism?
Answer: C
O has two unpaired electrons in its MO configuration -> paramagnetic.

Q80. Which quantum number determines the shape of orbital?
Answer: B
Azimuthal quantum number (l) determines orbital shape (s=0, p=1, d=2).

Q81. Which of the following reactions will NOT yield an alkyl halide?
Answer: D
Reaction A (Lucas test) yields CHCHCl. Reaction B (free radical halogenation) yields CHCH(Cl)CH and CHCHCHCl. Reaction C (hydrohalogenation of propene, Markovnikov's rule) yields CHCH(Br)CH. Reaction D (reaction of carboxylic acid with PCl) yields an acyl chloride (CHCHCOCl), not an alkyl halide.

Q82. The shape of NH molecule is:
Answer: B
NH: 3 bond pairs + 1 lone pair -> trigonal pyramidal shape.

Q83. What is the type of bond that occurs between two atoms with a large difference in electronegativity?
Answer: B
Ionic bonds occur between two atoms with a large difference in electronegativity, resulting in the transfer of electrons and the formation of ions.

Q84. For the reaction N2(g) + 3H2(g) = 2NH3(g), the partial pressures at a given instant are P(N2) = 0.2 atm, P(H2) = 0.1 atm and P(NH3) = 0.02 atm. What is the reaction quotient Qp at that instant?
Answer: B
Qp = P(NH3)^2 / [P(N2) x P(H2)^3] = (0.02)^2 / (0.2 x 0.1^3) = 0.0004 / 0.0002 = 2.0 atm^-2. Option B is correct.

Q85. The number of electrons in Na ion is:
Answer: B
Na (11 e) -> Na loses 1 e -> 10 electrons.

Q86. Which of the following is a saturated hydrocarbon?
Answer: B
Propane (C H) follows C H -> saturated alkane.

Q87. The catalyst used in the contact process for H2SO4 is:
Answer: A
Contact process uses V2O5 (vanadium pentoxide) as catalyst.

Q88. The IUPAC name of CHCOOH is:
Answer: B
CHCOOH -> 2 carbons -> Ethanoic acid (common: acetic acid).

Q89. The process of electrolysis is based on:
Answer: C
Electrolysis involves redox reactions at electrodes driven by electric current.

Q90. Which of the following has covalent bonding?
Answer: B
HO has covalent bonds (sharing of electrons). NaCl, KBr, CaO are ionic.

Q91. Which of the following reactions represents a Williamson ether synthesis?
Answer: B
Williamson ether synthesis involves the reaction of an alkoxide (formed from an alcohol and a strong base like Na) with an alkyl halide to form an ether. Option B correctly depicts this reaction.

Q92. pH scale ranges from:
Answer: C
pH scale ranges 0-14 (0-6 acidic, 7 neutral, 8-14 basic).

Q93. Which of the following shows paramagnetism?
Answer: C
O2 has two unpaired electrons in its MO configuration -> paramagnetic.

Q94. The pH of a neutral solution at 25°C is:
Answer: B
[H] = [OH] = 10 M pH = 7 at 25°C.

Q95. The bond angle in water is approximately:
Answer: C
Water has bent shape with 104.5 degrees angle due to lone pair repulsion.

Q96. In a redox reaction, oxidation involves:
Answer: A
Oxidation = loss of electrons, Reduction = gain of electrons (OIL RIG).

Q97. What is the hybridization of the carbon atom in methane?
Answer: C
The carbon atom in methane is bonded to four hydrogen atoms, and its electronic configuration is 1s2 2s2 2p2. To form four equivalent bonds, the carbon atom undergoes sp3 hybridization.

Q98. Which catalyst is used in the Haber process for ammonia synthesis?
Answer: B
Haber process uses finely divided iron with promoters (K2O, Al2O3) as catalyst.

Q99. Which of the following is NOT a polymer?
Answer: C
Glucose is a monomer (monosaccharide), not a polymer. Nylon, cellulose, PVC are polymers.

Q100. The IUPAC name of CH3COOH is:
Answer: B
CH3COOH -> 2 carbons -> Ethanoic acid (common: acetic acid).

Q101. The green pigment in plants that traps sunlight is:
Answer: B
Chlorophyll absorbs sunlight (mainly blue and red) for photosynthesis.

Q102. Which part of the flower becomes fruit?
Answer: C
After fertilization, the ovary develops into the fruit.

Q103. What is the primary function of the mitochondria in a cell?
Answer: C
The primary function of the mitochondria is to generate energy for the cell through the process of cellular respiration.

Q104. Blood group with no antigens on RBC is:
Answer: D
Blood group O has no A or B antigens on RBCs but has both anti-A and anti-B antibodies.

Q105. The process of cell division for growth is:
Answer: B
Mitosis produces identical daughter cells for growth and repair.

Q106. The process of cell division for growth is:
Answer: B
Mitosis produces identical daughter cells for growth and repair.

Q107. Which of these is a vestigial organ in humans?
Answer: C
Appendix is a vestigial organ (remnant of larger cecum in herbivore ancestors).

Q108. The powerhouse of the cell is:
Answer: C
Mitochondria produce ATP through cellular respiration, hence called the powerhouse of the cell.

Q109. The process of DNA replication is described as semi-conservative. What does this imply?
Answer: B
Semi-conservative replication means that each daughter DNA molecule contains one strand from the parent molecule and one newly synthesized strand.

Q110. Which organelle is involved in protein synthesis?
Answer: B
Ribosomes (composed of rRNA + proteins) synthesize proteins.

Q111. The pigment responsible for skin color is:
Answer: C
Melanin produced by melanocytes determines skin, hair, and eye color.

Q112. The respiratory pigment in human blood is:
Answer: B
Hemoglobin in RBCs transports O from lungs to tissues.

Q113. A person suffers from abnormally high blood glucose levels, frequent urination, and excessive thirst. Which of the following conditions is most likely causing these symptoms?
Answer: C
The symptoms described are classic indicators of Diabetes Mellitus. * **High blood glucose levels (hyperglycemia):** This is the hallmark of diabetes mellitus, caused by insufficient insulin production or insulin resistance, leading to glucose accumulation in the blood. * **Frequent urination (polyuria):** High glucose levels in the blood lead to glucose excretion in the urine, drawing water with it due to osmosis, resulting in increased urine output. * **Excessive thirst (polydipsia):** The loss of fluids through frequent urination leads to dehydration, triggering a sensation of intense thirst. Let's look at the other options: * **Diabetes insipidus:** Characterized by frequent urination and thirst, but it is due to a deficiency of ADH (vasopressin) or kidney's inability to respond to ADH, and does not involve high blood glucose levels. * **Hypothyroidism:** Caused by low thyroid hormone levels, leading to symptoms like weight gain, fatigue, cold intolerance, and slow metabolism, not primarily high blood glucose. * **Addison's disease:** Results from adrenal insufficiency, affecting cortisol and aldosterone production, leading to symptoms like fatigue, weight loss, low blood pressure, and skin hyperpigmentation, not typically high blood glucose.

Q114. The universal donor blood group is:
Answer: D
O negative is universal donor (no A/B antigens, no Rh factor).

Q115. The number of chromosomes in human cells is:
Answer: B
Humans have 23 pairs = 46 chromosomes (22 autosomes + 1 sex chromosome pair).

Q116. Blood group with no antigens on RBC is:
Answer: D
Blood group O has no A or B antigens on RBCs but has both anti-A and anti-B antibodies.

Q117. DNA replication is which type of process?
Answer: B
DNA replication follows the semiconservative model as demonstrated by Meselson and Stahl.

Q118. Which organ is responsible for blood filtration?
Answer: B
Kidneys filter blood through nephrons, removing waste and excess water to form urine.

Q119. Which enzyme breaks down starch in the mouth?
Answer: A
Salivary amylase (ptyalin) breaks down starch into maltose in the oral cavity.

Q120. The enzyme that breaks down proteins in stomach is:
Answer: B
Pepsin (in gastric juice) breaks proteins into peptides in acidic medium.

Q121. The longest bone in the human body is:
Answer: B
Femur (thigh bone) is the longest and strongest bone in the human body.

Q122. Which vitamin is produced in the skin on exposure to sunlight?
Answer: B
UV rays convert 7-dehydrocholesterol to Vitamin D in the skin.

Q123. Which hormone regulates blood sugar level?
Answer: B
Insulin lowers blood glucose, while glucagon raises it.

Q124. Which organelle is involved in protein synthesis?
Answer: B
Ribosomes (composed of rRNA + proteins) synthesize proteins.

Q125. The respiratory pigment in human blood is:
Answer: B
Hemoglobin in RBCs transports O2 from lungs to tissues.

Q126. Which of these is a prokaryote?
Answer: B
Bacteria are prokaryotes (no membrane-bound nucleus/organelles).

Q127. Which of these is a vestigial organ in humans?
Answer: C
Appendix is a vestigial organ (remnant of larger cecum in herbivore ancestors).

Q128. The DNA structure was discovered by:
Answer: C
Watson and Crick proposed the double helix structure of DNA in 1953.

Q129. DNA replication is which type of process?
Answer: B
DNA replication follows the semiconservative model as demonstrated by Meselson and Stahl.

Q130. What is the process by which water moves through a plant, from the roots to the leaves, and is then released into the air as water vapor?
Answer: C
Transpiration is the process by which water moves through a plant, from the roots to the leaves, and is then released into the air as water vapor.

Q131. Which hormone regulates blood sugar level?
Answer: B
Insulin lowers blood glucose, while glucagon raises it.

Q132. The number of chromosomes in human cells is:
Answer: B
Humans have 23 pairs = 46 chromosomes (22 autosomes + 1 sex chromosome pair).

Q133. Which part of the brain controls balance and coordination?
Answer: B
Cerebellum coordinates voluntary movements, balance, and posture.

Q134. The pigment responsible for skin color is:
Answer: C
Melanin produced by melanocytes determines skin, hair, and eye color.

Q135. In a DNA double helix, the two strands are joined by hydrogen bonds between the nitrogenous bases. Which of the following statements about these bonds is correct?
Answer: C
In the DNA double helix, specific base pairing rules are followed, known as Chargaff's rules: - Adenine (A) always pairs with Thymine (T) via two hydrogen bonds. - Guanine (G) always pairs with Cytosine (C) via three hydrogen bonds. Let's evaluate the options: A) Adenine forms two hydrogen bonds with Guanine. (Incorrect, A pairs with T, G pairs with C) B) Thymine forms three hydrogen bonds with Cytosine. (Incorrect, T pairs with A via two H-bonds, C pairs with G via three H-bonds) C) Adenine forms two hydrogen bonds with Thymine. (Correct) D) Guanine forms two hydrogen bonds with Cytosine. (Incorrect, G pairs with C via three H-bonds)

Q136. A person suffers from abnormally high blood glucose levels, frequent urination, and excessive thirst. Which of the following conditions is most likely causing these symptoms?
Answer: C
The symptoms described are classic indicators of Diabetes Mellitus.* **High blood glucose levels (hyperglycemia):** This is the hallmark of diabetes mellitus, caused by insufficient insulin production or insulin resistance, leading to glucose accumulation in the blood.* **Frequent urination (polyuria):** High glucose levels in the blood lead to glucose excretion in the urine, drawing water with it due to osmosis, resulting in increased urine output.* **Excessive thirst (polydipsia):** The loss of fluids through frequent urination leads to dehydration, triggering a sensation of intense thirst.Let's look at the other options:* **Diabetes insipidus:** Characterized by frequent urination and thirst, but it is due to a deficiency of ADH (vasopressin) or kidney's inability to respond to ADH, and does not involve high blood glucose levels.* **Hypothyroidism:** Caused by low thyroid hormone levels, leading to symptoms like weight gain, fatigue, cold intolerance, and slow metabolism, not primarily high blood glucose.* **Addison's disease:** Results from adrenal insufficiency, affecting cortisol and aldosterone production, leading to symptoms like fatigue, weight loss, low blood pressure, and skin hyperpigmentation, not typically high blood glucose.

Q137. Which part of the brain controls balance and coordination?
Answer: B
Cerebellum coordinates voluntary movements, balance, and posture.

Q138. What is the term for the process by which plants convert light energy into chemical energy?
Answer: B
Photosynthesis is the process by which plants convert light energy into chemical energy.

Q139. Which organ is responsible for blood filtration?
Answer: B
Kidneys filter blood through nephrons, removing waste and excess water to form urine.

Q140. Which vitamin is produced in the skin on exposure to sunlight?
Answer: B
UV rays convert 7-dehydrocholesterol to Vitamin D3 in the skin.

Q141. The largest gland in the human body is:
Answer: B
Liver is the largest gland (~1.5 kg) and performs 500+ functions.

Q142. Which disease is caused by a virus?
Answer: C
AIDS is caused by HIV (virus). Cholera/typhoid: bacteria, Malaria: protozoa.

Q143. The universal donor blood group is:
Answer: D
O negative is universal donor (no A/B antigens, no Rh factor).

Q144. Which of these is a prokaryote?
Answer: B
Bacteria are prokaryotes (no membrane-bound nucleus/organelles).

Q145. The enzyme that breaks down proteins in stomach is:
Answer: B
Pepsin (in gastric juice) breaks proteins into peptides in acidic medium.

Q146. DNA replication is which type of process?
Answer: B
DNA replication follows the semiconservative model as demonstrated by Meselson and Stahl.

Q147. Which enzyme breaks down starch in the mouth?
Answer: A
Salivary amylase (ptyalin) breaks down starch into maltose in the oral cavity.

Q148. Which chamber of the heart pumps blood to the lungs?
Answer: D
Right ventricle pumps deoxygenated blood to lungs via pulmonary artery.

Q149. Which disease is caused by a virus?
Answer: C
AIDS is caused by HIV (virus). Cholera/typhoid: bacteria, Malaria: protozoa.

Q150. The smallest bone in the human body is:
Answer: B
Stapes (stirrup bone in middle ear) is the smallest bone (~3 mm).

Q151. Which hormone is called the "fight or flight" hormone?
Answer: B
Adrenaline (epinephrine) prepares body for stress (increases HR, BP, etc.).

Q152. What is the term for the process by which water moves through a plant, from the roots to the leaves?
Answer: C
Transpiration is the process by which water moves through a plant, from the roots to the leaves, and is then released into the air as water vapor. This process is an important part of the water cycle and helps to regulate the plant's temperature and maintain its water balance.

Q153. What is the process by which water moves through a plant, from the roots to the leaves, and is then released into the air as water vapor?
Answer: C
Transpiration is the process by which water moves through a plant, from the roots to the leaves, and is then released into the air as water vapor.

Q154. The largest gland in the human body is:
Answer: B
Liver is the largest gland (~1.5 kg) and performs 500+ functions.

Q155. The main function of RBC is:
Answer: B
RBCs (erythrocytes) contain hemoglobin to transport O2 and CO2.

Q156. During DNA replication, which enzyme is responsible for synthesizing the new DNA strand by adding nucleotides complementary to the template strand?
Answer: C
During DNA replication, several enzymes play crucial roles: * **DNA ligase:** Joins the Okazaki fragments on the lagging strand by forming phosphodiester bonds. * **DNA helicase:** Unwinds the DNA double helix by breaking the hydrogen bonds between complementary base pairs, creating the replication fork. * **DNA polymerase:** This is the primary enzyme responsible for synthesizing new DNA strands. It adds deoxyribonucleotides one by one to the growing DNA strand, using the existing template strand as a guide to ensure complementary base pairing (A with T, G with C). * **Primase:** Synthesizes short RNA primers, which are necessary for DNA polymerase to initiate DNA synthesis, as DNA polymerase cannot start a new strand from scratch.

Q157. The green pigment in plants that traps sunlight is:
Answer: B
Chlorophyll absorbs sunlight (mainly blue and red) for photosynthesis.

Q158. The human heart has how many chambers?
Answer: C
Human heart has 4 chambers: 2 atria and 2 ventricles.

Q159. What is the term for the process by which plants convert light energy into chemical energy?
Answer: B
Photosynthesis is the process by which plants, algae, and some bacteria convert light energy from the sun into chemical energy in the form of glucose. This process occurs in specialized organelles called chloroplasts and is essential for life on Earth.

Q160. The process of cell division for growth is:
Answer: B
Mitosis produces identical daughter cells for growth and repair.

Q161. During DNA replication, which enzyme is responsible for synthesizing the new DNA strand by adding nucleotides complementary to the template strand?
Answer: C
During DNA replication, several enzymes play crucial roles:* **DNA ligase:** Joins the Okazaki fragments on the lagging strand by forming phosphodiester bonds.* **DNA helicase:** Unwinds the DNA double helix by breaking the hydrogen bonds between complementary base pairs, creating the replication fork.* **DNA polymerase:** This is the primary enzyme responsible for synthesizing new DNA strands. It adds deoxyribonucleotides one by one to the growing DNA strand, using the existing template strand as a guide to ensure complementary base pairing (A with T, G with C).* **Primase:** Synthesizes short RNA primers, which are necessary for DNA polymerase to initiate DNA synthesis, as DNA polymerase cannot start a new strand from scratch.

Q162. The respiratory pigment in human blood is:
Answer: B
Hemoglobin in RBCs transports O from lungs to tissues.

Q163. Which vitamin is water soluble?
Answer: C
Vitamin C and B-complex are water-soluble. A, D, E, K are fat-soluble.

Q164. Which part of the nephron is impermeable to water but permeable to salts, leading to the dilution of filtrate?
Answer: C
The ascending limb of Henle's loop is characterized by its impermeability to water. However, it actively reabsorbs sodium and chloride ions (and some other electrolytes) from the filtrate into the interstitial fluid. As solutes are removed from the filtrate but water is retained, the filtrate becomes progressively more dilute as it moves up the ascending limb. - PCT: Permeable to both water and salts, involved in bulk reabsorption. - Descending limb of Henle's loop: Highly permeable to water but largely impermeable to electrolytes, leading to concentration of filtrate. - DCT: Involved in conditional reabsorption of water and sodium, not primarily responsible for initial dilution due to impermeability to water while being permeable to salts.

Q165. The number of chromosomes in human cells is:
Answer: B
Humans have 23 pairs = 46 chromosomes (22 autosomes + 1 sex chromosome pair).

Q166. Which hormone regulates blood sugar level?
Answer: B
Insulin lowers blood glucose, while glucagon raises it.

Q167. Which hormone is called the "fight or flight" hormone?
Answer: B
Adrenaline (epinephrine) prepares body for stress (increases HR, BP, etc.).

Q168. Which enzyme breaks down starch in the mouth?
Answer: A
Salivary amylase (ptyalin) breaks down starch into maltose in the oral cavity.

Q169. Which vitamin is water soluble?
Answer: C
Vitamin C and B-complex are water-soluble. A, D, E, K are fat-soluble.

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Q171. The pigment responsible for skin color is:
Answer: C
Melanin produced by melanocytes determines skin, hair, and eye color.

Q172. The number of chromosomes in human cells is:
Answer: B
Humans have 23 pairs = 46 chromosomes (22 autosomes + 1 sex chromosome pair).

Q173. The disease caused by deficiency of insulin is:
Answer: B
Diabetes mellitus is caused by insufficient insulin production or insulin resistance.

Q174. The enzyme that breaks down proteins in stomach is:
Answer: B
Pepsin (in gastric juice) breaks proteins into peptides in acidic medium.

Q175. Which of the following hormones is secreted by the anterior pituitary gland?
Answer: C
The anterior pituitary gland secretes several hormones, including Growth Hormone (GH), Thyroid-Stimulating Hormone (TSH), Adrenocorticotropic Hormone (ACTH), Follicle-Stimulating Hormone (FSH), Luteinizing Hormone (LH), and Prolactin. ADH and Oxytocin are secreted by the posterior pituitary, and Melatonin is secreted by the pineal gland.

Q176. Which of the following is a primary lymphoid organ where B-lymphocytes mature?
Answer: C
Primary lymphoid organs are sites where lymphocytes mature and proliferate. The bone marrow is the primary lymphoid organ where all blood cells, including lymphocytes, are produced, and B-lymphocytes mature. T-lymphocytes mature in the thymus.

Q177. What is the term for the process by which an organism's genetic information is used to synthesize proteins and other molecules in response to environmental stimuli?
Answer: C
Gene expression is the process by which an organism's genetic information is used to synthesize proteins and other molecules in response to environmental stimuli. This involves the transcription of DNA into RNA and the translation of RNA into protein, and is essential for the proper functioning of the organism.

Q178. Which organelle is involved in protein synthesis?
Answer: B
Ribosomes (composed of rRNA + proteins) synthesize proteins.

Q179. Which enzyme breaks down starch in the mouth?
Answer: A
Salivary amylase (ptyalin) breaks down starch into maltose in the oral cavity.

Q180. The disease caused by deficiency of insulin is:
Answer: B
Diabetes mellitus is caused by insufficient insulin production or insulin resistance.

Q181. Which of the following characteristics is unique to mammals among vertebrates?
Answer: C
Mammals are defined by the presence of mammary glands that produce milk. Amphibians and reptiles have different heart structures; birds have feathers but lay eggs; reptiles and amphibians are generally cold-blooded.

Q182. Which of the following pairs represents a correct match between an animal phylum and a characteristic feature?
Answer: B
Cnidarians exhibit radial symmetry and possess specialized stinging cells called cnidocytes. Poriferans lack true tissues; Annelids have segments but lack jointed appendages (that is a trait of Arthropods); Arthropods have hard exoskeletons and jointed legs, not soft unsegmented bodies.

Q183. Which of the following blood cells plays the most critical role in the immune response by engulfing pathogens?
Answer: C
Neutrophils are phagocytic white blood cells that engulf and destroy bacteria. Erythrocytes carry oxygen, Thrombocytes are involved in clotting, and Plasma proteins transport substances but do not directly engulf pathogens.

Q184. Which of the following structures is NOT part of the human male reproductive system?
Answer: B
The ovary is a female reproductive organ responsible for egg production. The seminal vesicle and prostate gland contribute to semen production in males, and the epididymis stores and matures sperm.

Q185. Which of the following blood groups is considered the universal donor for red blood cell transfusions?
Answer: D
Blood group O-negative lacks A, B, and Rh antigens on the red blood cells, making it safe to transfuse into recipients of any blood type. A+ has A antigen and Rh factor; B- has B antigen; AB+ has both A and B antigens, limiting their compatibility.

Q186. Which of the following structures in the human heart is responsible for preventing the backflow of blood from the left ventricle to the left atrium during systole?
Answer: B
The Mitral (bicuspid) valve is located between the left atrium and left ventricle, ensuring unidirectional flow. The Tricuspid valve is on the right side, while both semilunar valves prevent backflow into the arteries during ejection.

Q187. In the context of plant physiology, which hormone is primarily responsible for promoting cell elongation and stem growth?
Answer: B
Gibberellins stimulate cell division and elongation, leading to stem growth. Abscisic acid inhibits growth and promotes dormancy, Cytokinins promote cell division but not primarily elongation, and Ethylene regulates fruit ripening.

Q188. The evolutionary trend towards the development of wings in birds and bats is an example of:
Answer: B
Wings in birds and bats are analogous structures because they evolved independently for flight in different lineages, making this convergent evolution. Homology refers to similar structures due to common ancestry; vestigiality refers to reduced organs with no function.

Q189. The process by which ammonia produced from amino acid deamination is converted into urea in the liver is an example of:
Answer: B
The Urea Cycle (Ornithine Cycle) specifically converts toxic ammonia into less toxic urea for excretion. Glycolysis breaks down glucose, the Krebs Cycle generates ATP from acetyl-CoA, and the Electron Transport Chain produces ATP via oxidative phosphorylation.

Q190. Which of the following organisms exhibits metamorphosis during its life cycle?
Answer: A
Frogs undergo distinct metamorphosis from an aquatic tadpole stage to a terrestrial adult frog. Earthworms have direct development; penguins are mammals with no larval stage; while some jellyfish have complex life cycles involving polyp and medusa stages, 'metamorphosis' in the standard zoological context of vertebrate exams most distinctly applies here.

Q191. Which of the following organisms exhibits a life cycle with distinct larval and adult stages involving metamorphosis?
Answer: B
Frogs undergo complete metamorphosis from tadpole to adult frog. Earthworms, snakes (reptiles), and sharks generally do not exhibit such distinct metamorphic stages in their life cycles.

Q192. Which of the following structures in a neuron is primarily responsible for receiving signals from other neurons or sensory receptors?
Answer: B
Dendrites are branched extensions of the neuron specifically designed to receive incoming electrical and chemical signals. The axon conducts impulses away from the cell body, the myelin sheath insulates the axon for faster transmission, and the node of Ranvier is a gap in the myelin where saltatory conduction occurs.

Q193. Which of the following structures in the human ear is directly responsible for converting sound vibrations into electrical signals sent to the brain?
Answer: C
The Organ of Corti contains hair cells that transduce mechanical vibrations into nerve impulses. The Tympanic membrane receives sound waves, the Ossicles amplify them, and the Semicircular canals detect balance.

Q194. What is the primary function of the stomata found on the epidermis of plant leaves?
Answer: A
Stomata are microscopic pores that open to allow carbon dioxide intake for photosynthesis and release oxygen and water vapor (transpiration). Photosynthesis occurs in chloroplasts within cells, not the pore itself; water absorption is done by roots; defense involves trichomes or chemical compounds.

Q195. Which of the following hormones acts as a counter-regulatory hormone to insulin by raising blood glucose levels?
Answer: B
Glucagon is secreted by the pancreas when blood sugar is low and stimulates glycogen breakdown to raise glucose levels. Insulin lowers blood sugar; Thyroxine regulates metabolism but does not directly oppose insulin's immediate effect on glucose; Melatonin regulates sleep cycles.

Q196. In birds, the presence of a four-chambered heart is an adaptation that supports which physiological requirement?
Answer: C
A four-chambered heart allows complete separation of oxygenated and deoxygenated blood, supporting the high metabolic rate needed for flight and maintaining constant body temperature (endothermy). Cold-blooded animals typically have three-chambered hearts.

Q197. The presence of a diaphragm is a defining characteristic of which group of animals?
Answer: C
The diaphragm is a muscular partition separating the thoracic and abdominal cavities, essential for efficient breathing in mammals. Reptiles, birds, and amphibians rely on different mechanisms (rib movement or buccal pumping) and lack this specific structure.

Q198. The process by which water evaporates from the leaves of a plant, creating a suction force that pulls water up from the roots, is called:
Answer: C
Transpiration is the evaporation of water from plant surfaces (mainly stomata) which generates negative pressure to pull water upward. Translocation refers to sugar transport; photosynthesis converts light to chemical energy; osmosis is passive water movement across a membrane.

Q199. In humans, the primary function of the thymus gland during childhood is:

Answer: B

The thymus gland is crucial for the development and maturation of T-lymphocytes (T-cells), which are essential for adaptive immunity. Insulin is produced by the pancreas, adrenaline by the adrenal medulla, and blood calcium regulation involves the parathyroid glands.

Q200. In the human circulatory system, which component of the blood is primarily responsible for clotting?

Answer: C

Platelets (thrombocytes) are cell fragments that aggregate at injury sites to form a plug and release factors initiating the clotting cascade. Red blood cells transport oxygen; white blood cells fight infection; plasma is the liquid medium carrying dissolved substances.