BIOLOGY

1. Lipids are organic compounds that in a living cell may combine with:
   A. proteins
   B. polysaccharides
   C. DNA
   D. RNA
   E. true is A and B

2. Smooth endoplasmic reticulum is found in:
   A. prokaryotes
   B. eukaryotes
   C. bacteria
   D. true is A and C
   E. all is true

3. A prokaryotic cell does not contain:
   A. nucleoid
   B. nucleolus
   C. RNA
   D. DNA
   E. ribosomes

4. **The rough ER is so named because it has an abundance of _____ on it.**
   A. mitochondria
   B. lysosomes
   C. Golgi bodies
   D. ribosomes
   E. vesicles

5. **Animal and plant cells share the same structures except for:**
   A. Golgi apparatus
   B. ER
   C. nucleus
   D. nucleolus
   E. thylakoids

6. "Proteins embedded in a lipid bilayer" best describes the following structure:
   A. cell membrane
   B. nucleus
   C. nucleolus
   D. polypeptide chain
   E. mitotic spindle

7. **ATP is required in the transport of:**
   A. water molecules
   B. all molecules across the membrane
   C. molecules to areas of lower concentration
   D. molecules to areas of higher concentration
   E. molecules through the lipid bilayer

8. Nucleus contains:
   A. nucleoid and chromatin
   B. nucleoplasm and chromatin
   C. nucleoid and nucleolus
   D. nucleoid and DNA
   E. nucleoid and RNA

9. Prior to cell division, each chromosome replicates its genetic material. The products are connected by a centromere and are called:
   A. sister chromosomes
   B. homologous chromosomes
   C. sex chromosomes
   D. sister chromatides
   E. chromatin

10. Four stages of mitosis proceed in the following sequence:
   A. prophase, anaphase, telophase, metaphase
   B. cytokinesis, anaphase, metaphase, prophase
   C. prophase, cytokinesis, telophase, metaphase
   D. prophase, anaphase, metaphase, telophase
   E. none is true

11. During meiosis, any of the two chromosomes belonging to the whole chromosome set, randomly:
   A. become paired
   B. exchange genetic material
   C. are subjected to crossing over
   D. all is false
   E. all is true

12. **Different types of cells produced during oogenesis are called:**
   A. oogonium, oogamy, oocyte
   B. oocyte I, oocyte II, oospore
   C. oocyte I, oocyte II, oocyte III
   D. oospore, oogonium, polar body
   E. oogonium, oocyte, polar body

13. Spermatogenesis gives rise to spermatides which are:
   A. haploid
   B. diploid
   C. poliploid
   D. precursors of spermatozoa
   E. A and D are true

14. **In humans, fertilization of an egg normally takes place when the sperm and egg unite in the:**
   A. vagina
   B. uterus
   C. fallopian tube
   D. ovary
   E. all of the above are locations for fertilization

15. **The membrane which forms a sac, filled with fluid, that serves as a protection for the developing embryo is the:**
    A. allantois
    B. chorion
    C. amnion
    D. placenta
    E. yolk sac

16. Conjugation, transformation and transduction are connected to:
    A. viruses
    B. bacteria
    C. eucaryotic cells
    D. protein synthesis
    E. meiosis

17. **Genetically identical organisms derived from a single genetic source are called:**
    A. populations
    B. clones
    C. varieties
    D. siblings
    E. ecotypes

18. **All mentioned below about DNA structure is correct EXCEPT:**
    A. sugar-phosphate backbone
    B. double helix
    C. hydrogen bonding between base pairs
    D. nucleotide triplets are forming codons
    E. deoxyribose and a base form a nucleotide

19. Codon is a:
    A. triplet
    B. sequence of aminoacids
    C. sequence of proteins
    D. part of a transducing sequence
    E. part of the transfer DNA

20. Find the false statement among the following:
    A. Anticodon is a part of the tRNA.
    B. Codon is a triplet found in the mRNA.
    C. For transcription the DNA polymerase is used.
    D. Sugar-phosphate backbone is a part of the DNA and of the RNA molecule.
    E. Anticodons and codons must be complementary.

21. **M-phase of the cell cycle is comprised of:**
    A. growth and mitosis
    B. mitosis and cytokinesis
    C. disintegration of nuclear envelope and mitosis
    D. prophase and nuclear division
    E. metaphase, anaphase and telophase

22. The result of the monohybrid cross in the F2 generation is a characteristic 3:1 ratio of:
    A. dominant : recessive phenotypes
    B. recessive : dominant phenotypes
    C. homozygotic : heterozygotic genotypes
    D. heterozygotic : homozygotic genotypes
    E. hemizygotic : homozygotic genotypes

23. Find the wrong statement among the following that are true for more than two alternative forms of a single gene:
    A. They are multiple alleles.
    B. They can be found at the same locus.
    C. All of them can be found in the single individual.
    D. All of them can be found in a population.
    E. They control the ABO system of blood groups.

24. **In a dihybrid cross parental generation can consist of parents that are:**
    A. both heterozygous for both traits
    B. one of the parents is heterozygous for both traits
    C. one of the parents must be dominant and the other recessive for both traits
    D. both dominant for both traits
    E. both homozygous for both traits

25. In the classical test cross, the testing of the dominant phenotype is always done with:
    A. a recessive homozygote
    B. a dominant homozygote
    C. a recessive hemizygote
    D. a nonrecessive hemizygote
    E. any of the above mentioned

26. Haemophilia is a hereditary:
    A. autosomal dominant disease
    B. autosomal recessive disease
    C. Y-linked disease
    D. X-linked disease
    E. chromosome 21 linked-disease

27. **Recombination of genes is the result of all except:**
    A. crossing-over
    B. chiasma
    C. transduction
    D. transformation
    E. transfection

28. **Which disease is usually not the result of a mutation:**
    A. Down syndrome
    B. cancer
    C. triple X
    D. haemophilia
    E. haemolysis

29. What does a restriction enzyme do?
    A. restricts transcription
    B. prevents DNA from replicating
    C. cuts DNA at specific sites
    D. converts DNA into RNA
    E. replicates DNA

30. **Hearts own pacemaker is called:**
    A. ventricular node
    B. atrioventricular node
    C. sinoatrialnode
    D. atrial node
    E. heart node

31. Appendix (vermiform) is an outgrowth of the:
    A. oesophagus
    B. larynx
    C. axial skeleton
    D. colon
    E. brain

32. Oxygen is transported from lungs to tissues:
    A. by facilitated diffusion through channel proteins
    B. by active transport through the membrane
    C. by macrophages
    D. by platelets
    E. bounded to haemoglobin in erythrocytes

33. A concentration of carbon dioxide in the blood stimulates the breathing center in the:
    A. lungs
    B. cerebrum
    C. throat
    D. cerebellum
    E. medulla oblongata

34. **The majority of oxygen in the bloodstream is carried in red blood cells on a globular protein called:**
    A. serum
    B. fibrinogen
    C. plasma
    D. albumin
    E. hemoglobin

35. **Adrenal cortex produces:**
    A. adrenaline
    B. androgens and oestrogens
    C. noradrenaline
    D. adrenaline and noradrenaline
    E. adrenaline and corticosteroids

36. Olfaction is:
    A. the process of producing oils
    B. an oil-immersion lens
    C. a part of the oestrus cycle
    D. the sense of smell
    E. the formation of oligonucleotides

37. The spleen and lymph nodes are part of the:
    A. connective tissue
    B. immune system
    C. digestive system
    D. endocrine system
    E. neuromuscular junction

38. Ecology is the study of the interrelationships between organisms and their:
    A. living environment
    B. nonliving environment
    C. ecosystem
    D. ecological equivalents
    E. true is A and B

39. Cromagnon and Neanderthal men are:
    A. suffering from X-linked hereditary diseases
    B. suffering from autosomal dominant hereditary diseases
    C. suffering from autosomal recessive hereditary diseases
    D. men suffering from anaemias
    E. fossil men, cave dwellers

40. **A region that has a characteristic set of environmental conditions and consequently a particular type of fauna and flora is called:**
    A. biotype
    B. biotic factor
    C. biosphere
    D. biotope
    E. bioreactor

PHYSICS

41. The half-life of a radioactive substance is 5 minutes. Which of the following statements is true for the decay of this substance?
    A. After 10 minutes, one fourth of the original substance will remain.
    B. The amount of remaining substance is proportional to the number of minutes passed.
    C. The amount of remaining substance is inversely proportional to the number of minutes passed.
    D. After 10 minutes, none of the original substance will remain unchanged.
    E. After 5 minutes, none of the original substance will remain unchanged.

42. **Assuming the mass of material which is transformed into energy, in a fission of uranium, to be 0.1% of the present uranium, the number of joules produced by the fission of 1 kg of uranium is approximately:**
    A. 10^7
    B. 9×10^{12}
    C. 5.6×10^{14}
    D. 9×10^{13}
    E. 3×10^{12}

43. Which of the following correctly balances in the decay reaction?
    $^{230}_{90}Th$ goes to $^{0}_{-1}e$ + ...
    A. $^{230}_{91}Th$
    B. $^{230}_{89}Ac$
    C. $^{231}_{89}Ac$
    D. $^{230}_{91}Pa$
    E. $^{231}_{91}Pa$

44. The neutrons in an atom:
    A. contribute to the nuclear charge
    B. revolve about the nucleus in elliptical orbits
    C. vary in number in different isotopes
    D. equal in number to the total number of protons
    E. equal in number to the number of electrons

45. Which has the most energy per photon?
    A. red light
    B. violet light
    C. ultra-violet light
    D. all the same, if the intensities are the same
    E. green light

46. **The maximum energy of emitted photoelectrons may be dependent on:**
I. the range of frequencies of the light
II. the intensity of the light
III. the type of metal
IV. the thickness of the metal

A. I, II, III
B. I, II, IV
C. II, III
D. I, III
E. I, IV

47. **The propagation speed of light in a diamond is 1.25×10^8 ms^{-1}. Calculate the wave length of light in the diamond if the frequency of that wave in the vacuum is 6.25×10^{14} Hz!**
A. 1152 nm
B. 960 nm
C. 480 nm
D. 240 nm
E. 200 nm

48. For light striking obliquely the surface of a medium of higher refractive index:
A. the angle of refraction is larger than the angle of incidence
B. the velocity increases on entering
C. there can be no critical angle
D. no reflection can take place
E. there is no transmission to that medium

49. A thin converging lens has a focal length of 10 cm. An object 2 cm high is placed 20 cm from the lens. Which of the following is NOT true for the image created?
A. it is 2 cm high
B. it is erect
C. it is 20 cm from the lens
D. it is real
E. it is on the opposite side of the lens

50. **Heat rays differ from light rays in their:**
A. obedience to the laws of reflection
B. obedience to the laws of refraction
C. effect on the retina of the eye
D. speed of travel in a vacuum
E. none of the above

51. When the sound wave is refracted from the air into the water, its:
A. speed and wavelength increase
B. speed and wavelength decrease
C. wavelength increases and its frequency decreases
D. speed increases and its wavelength decreases
E. frequency must be changed

52. **Three meters long wire is fixed on both ends. The wave length of standing wave that is created on that wire is:**
    A. 5 m
    B. 4 m
    C. 3/2 m
    D. 5/6 m
    E. 4/5 m

53. In simple harmonic motion, the acceleration is:
    A. constant
    B. proportional to the displacement from the central position
    C. inversely proportional to the displacement from the central position
    D. greatest when the velocity is greatest
    E. inversely proportional to the velocity

54. The resonant frequency of an electrical oscillator is determined by the values of its:
    A. resistor and capacitor
    B. resistor and coil
    C. capacitor and coil
    D. resistor, capacitor and coil
    E. resistor only

55. **The output of a transformer for use on a 240 V main supply is rated at 12 V, 4.5 A. If the efficiency of the transformer on full load is estimated at 90%, the maximum primary current would be:**
    A. 2.50 A
    B. 2.25 A
    C. 1.25 A
    D. 0.25 A
    E. 0.22 A

56. **An electric device with effective power 530 mW is connected to an alternating source which gives effective voltage 50 V. What is the maximum value of electric current in that circuit?**
    A. 106 mA
    B. 10.6 mA
    C. 1.5 mA
    D. 150 mA
    E. 15 mA

57. The magnetic field strength near a long straight current carrying wire is:
    A. proportional to the current and to the square of the distance from the wire
    B. inversely proportional to the current and the distance from the wire
    C. proportional to the current and inversely proportional to the distance from the wire
    D. inversely proportional to the current and to the square of the distance from the wire
    E. independent of the current

58. **A current carrying wire is placed into homogenous magnetic field in the direction of magnetic lines. Which statement is true?**
    A. Magnetic field force acting on the wire is proportional to the length of the wire.
    B. Magnetic field force acting on the wire does not depend on the length of the wire.
    C. Magnetic field force acting on the wire is proportional to the electric current.
    D. Magnetic field force does not act on the wire.
    E. Magnetic field force acts on the wire perpendicular to the magnetic field lines.

59. A positively charged particle traveling in a straight line may travel in the arc of a circle if it enters an area where there is a fixed field:
    A. electric field oblique to the direction of motion of the particle
    B. electric field parallel to the direction of motion of the particle
    C. magnetic field at right angle to the direction of motion of the particle
    D. magnetic field parallel to the direction of motion of the particle
    E. any gravitational field

60. **A particle with mass m and charge Q is moving along the lines of electric field E. The work done by the force F along the path s on the particle in that electric field is:**
    A. W = Qs/E
    B. W = Es/Q
    C. W = QEs
    D. W = EQ
    E. W = QE/s

61. A coil of resistance wire is immersed in 100 g of water at 10 ^{0}C. A battery is connected to the coil and the current flowing, adjusted by means of a rheostat, is 1,4 A when the potential difference across the coil is 6 V. Assuming that the heat capacity of the container and coil is negligible and that no heat is lost to the surrounding, the temperature of the water after 100 s would be (c_{water}=4200 J/kg K):
    A. 12 ^{0}C
    B. 14 ^{0}C
    C. 16 ^{0}C
    D. 18 ^{0}C
    E. 20 ^{0}C

62. **The voltage source with electromotive force, E, and internal resistance, r, is connected to an external resistor R. The voltage drop at the resistor is U. Which statement is true?**
    A. U is higher than E
    B. U is smaller than E
    C. (Ir + U) is higher than E
    D. Ir = E
    E. U = E if r = R

63. **Two resistors with resistances 2 Ω and 3 Ω are connected in parallel. Calculate the resistance of a resistor which should be added into the circuit in series, if we want the total resistance of the circuit to be 2 Ω?**
    A. 0.2 Ω
    B. 0.3 Ω
    C. 0.8 Ω
    D. 1.2 Ω
    E. 1.8 Ω

64. **Which of these statements are correct for an electric field?**
    A. It is a vector quantity, and can be cancelled out.
    B. It is the altered space surrounding electric charge.
    C. It stores electric energy.
    D. Two of three are correct.
    E. Three of three are correct.

65. **At a distance r_1 from a point charge the magnitude of its electric field and potential are E_1 and V_1 respectively. At a distance $r_2 = r_1/2$ the magnitude of its electric field E_2 and potential V_2 are:**
    A. $E_2 = E_1/2$
       $V_2 = V_1/2$
    B. $E_2 = 2E_1$
       $V_2 = 2V_1$
    C. $E_2 = 2E_1$
       $V_2 = 4V_1$
    D. $E_2 = 4E_1$
       $V_2 = 2V_1$
    E. $E_2 = 4E_1$
       $V_2 = 4V_1$

66. **A piece of copper is heated by immersion in boiling water for several minutes and is then dropped into a calorimeter containing water. The experiment is then repeated using the same piece of copper heated in the same way but this time it is dropped into oil contained in the same calorimeter. The mass of the oil is the same as that of the water. If the initial temperatures of oil and water are the same, the final temperature of the water is lower than that of the oil because the:**
    A. relative density of the oil is less than that of the water
    B. volume of the oil is greater than that of the water
    C. heat capacity of the water is greater than that of the oil
    D. heat absorbed by the calorimeter containing water is less than that absorbed by the calorimeter containing oil
    E. heat loss from the water is less than that from the oil

67. An aneurysm is an abnormal enlargement of a blood vessel such as the aorta. Suppose that, because of an aneurysm, the cross-sectional area A_1 of the aorta increases to a value $A_2 = 1{,}7A_1$. The speed of blood, with average density of 1060 kg/m^3, through a normal portion of the aorta is $v_1 = 0{,}40$ m/s, and through the enlarged region is $v_2 = 0{,}24$ m/s. Using the model of an ideal fluid and assuming that aorta is horizontal (the person is lying down), determine the amount by which the pressure P_2 in the enlarged region exceeds the pressure P_1 in the normal region!

A. 212 Pa
B. 115 Pa
C. 108 Pa
D. 54 Pa
E. 22 Pa

68. **Which completed statement is NOT correct?**
If corresponding values of pressure p and volume V are obtained experimentally for a fixed mass of gas at constant temperature it will be found that:
A. the product of p and V is constant
B. the graph of p against 1/V is a straight line
C. V is inversely proportional to p
D. the graph of p against 1/V passes through the origin
E. the graph of p against V is parabola

69. A mass of gas enclosed in a cylinder by a piston is heated gently. At the same time the piston is moved so that the pressure remains constant. As a result of this what will happen?
A. Average velocity of the molecules will increase.
B. Mean separation of the molecules will increase.
C. Number of impacts per second of the molecules on the piston will increase.
D. Two of three are correct.
E. Three of three are correct.

70. The relationship between the pressure and the volume of a gas, as expressed by Boyle's law, holds true:
A. if the density is constant
B. if the container of gas can expand with increasing pressure
C. if the temperature is constant
D. for some gases under any conditions
E. for all gases under any conditions

71. The law of conservation of energy is a statement that:
A. energy must be conserved and you are breaking a law if you waste energy
B. the supply of energy is limited so we must conserve
C. energy cannot be used faster than it is created
D. the total amount of energy is constant
E. you have to take care about the procedure when storing energy

72. Achilles tendon is attached to the heel. The tendon exerts a force of magnitude F = 720 N. Determine the torque magnitude of this force, about the ankle joint which is located 3.6×10^{-2} m away from the point of attachment, when the force direction is perpendicular to a foot!
    A. 20 kN/m
    B. 26 Nm
    C. 13 Nm
    D. 3.6 Nm
    E. 50 mN/m

73. **A car reaches the speed of 100 km/h for 8 s. The average acceleration in SI units is:**
    A. 2.46
    B. 3.47
    C. 4.48
    D. 5.49
    E. 6.50

74. A ball rolls off the edge of a horizontal table at 4 ms^{-1}. The ball hits the ground 0.4 s later. Assuming g = 10 ms^{-2}, which of the following statements is true?
    A. The ball hits the ground with speed 4 ms^{-1}.
    B. The ball hits the ground at a horizontal distance of 1.6 m from the edge of the table.
    C. The height of the table is 1.6 m.
    D. The height of the table is 4 m.
    E. The ball hits the ground at a horizontal distance of 4 m from the edge of the table.

75. Each of the following is an application of the law of action and reaction EXCEPT the:
    A. removal of water from clothes in a spin dryer
    B. recoil of a gun when fired
    C. breaking of a cup when dropped on the floor
    D. equilibrium of a book resting on a table
    E. difficulty of stepping out of a small boat

76. You have kinetic energy when you run. If you run three times as fast you'll have a kinetic energy:
    A. 3 times as much
    B. 6 times as much
    C. 9 times as much
    D. that is the same
    E. none of these

77. An astronaut with a mass of 75 kg is being spun in a centrifuge with a radius of 40 m at a speed of 26 m/s. What is the centripetal force on the astronaut?
    A. 2 028 kN
    B. 78 kN
    C. 1 268 N
    D. 634 N
    E. 48.75 N

78. **Vectors a and b are perpendicular. Their absolute values are |a| = 7 and |b| = 3. Calculate the absolute value of vector |a + b|!**
    A. 57.9
    B. 49.4
    C. 9.3
    D. 7.6
    E. 6.3

79. An elevator with a mass of 1 500 kg is supported by cable which can withstand a maximum tension of 18 000 N. The maximum acceleration of the lift that the cable can withstand is:
    A. 0.83 ms^{-2}
    B. 1.2 ms^{-2}
    C. 2.2 ms^{-2}
    D. 12 ms^{-2}
    E. 22 ms^{-2}

80. **Which of the listed relationships of physical parameters can graphically be described by parabola?**
    A. the pressure of gas and its temperature
    B. the kinetic energy of body and its speed
    C. the buoyant force in liquids and the volume of immersed body
    D. the gravitational force between bodies and their distance
    E. the force on a conducting wire in a magnetic field and the electric current through it

CHEMISTRY

81. **The process in which molecules go directly from the solid into the vapour phase is called:**
    A. crystallization
    B. vaporization
    C. melting
    D. condensation
    E. sublimation

82. **How many grams of solute are present in 250 mL of a 0.1 M solution of potassium chloride?**
    A. 0.025
    B. 1.87
    C. 7.46
    D. 2.77
    E. 4×10^{-4}

83. **Which of the named forms has the following electron configuration: $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^5$?**
A. V
B. Fe^{2+}
C. Fe^{3+}
D. Mn
E. Cr^{3+}

84. **How many particles contain 0.5 mole of the Al^{3+} ion?**
A. 2.00×10^{23}
B. 3.01×10^{23}
C. 9.03×10^{23}
D. 1.0×10^{23}
E. 12.04×10^{-23}

85. In ATP molecule phosphates are linked together by:
A. peptide bond
B. glycosidic bond
C. ester bond
D. anhydrous bond
E. ether bond

86. **At 25 ^{o}C and 1.00 atm pressure, 1.00 mole of methane will occupy a volume of:**
A. 22.4 L
B. 24.5 L
C. 23.5 L
D. 25.4 L
E. 21.5 L

87. **The ideal tetrahedral angle amounts to:**
A. $360/4\ ^{0}$
B. $140\ ^{0}$
C. $104\ ^{0}$
D. $109.5\ ^{0}$
E. $120\ ^{0}$

88. A reaction will occur spontaneously if the heat of formation of the product is:
A. large and negative
B. small and negative
C. large and positive
D. small and positive
E. large or small positive

89. **Renal calculus is usually composed of:**
A. sodium carbonate
B. calcium acetate
C. calcium oxalate
D. sodium chloride
E. potassium nitrate

90. **Ion-product constant of water at 25 ^{o}C is:**

A. 1×10^{14} mol^2 / L^2
B. 1×10^{-14} mol^2 / L^2
C. 1×10^{-14} mol / L
D. 1×10^{-7} mol / L
E. 55.6 mol / L

91. **Which of the following acids is not classified as a strong acid?**

A. HCl
B. HF
C. HNO_3
D. $HClO_4$
E. H_2SO_4

92. **Which of the following chemical entities is the strongest oxidizing agent?**

A. Li
B. Li^+
C. H^+
D. F_2
E. F^-

93. **Which of the following substances has the highest standard reduction potential?**

A. Li
B. Cu
C. Br_2
D. F_2
E. H_2

94. **The half-life of a first-order reaction equals to:**

A. Δ[reactants] / Δ [t]
B. 1/2
C. $1/k \ln[A_0] / [A]$
D. $0.693/k$
E. k[A]

95. **In which of the following conditions will the *K* value of equilibrium change?**

A. temperature
B. pressure
C. concentration of reactants
D. concentration of products
E. entropy

96. **What is the hydrogen percentage (% by volume) in the air of the Earth atmosphere?**
    A. 78
    B. 21
    C. 1
    D. 0.033
    E. 0

97. **Which of the following oxides is amphoteric?**
    A. CO_2
    B. NO
    C. CaO
    D. Al_2O_3
    E. N_2O_5

98. **The highest oxidation state for a transition metal is:**
    A. +3
    B. +4
    C. +5
    D. +6
    E. +7

99. **More is atoms bonded to C in reaction which we call:**
    A. addition
    B. elimination
    C. substitution
    D. condensation
    E. oxidation

100. **At the room temperature in the liquid state are those alkanes which have:**
    A. 1-4 C atoms
    B. 5-17 C atoms
    C. 17-25 C atoms
    D. 25-30 C atoms
    E. They can't be in the liquid state

101. **Which of following molecules has the porphyrin ring in its structure?**
    A. A vitamin
    B. C vitamin
    C. folic acid
    D. B_6 vitamin
    E. haemoglobine

102. **Slight oxidation of a secondary alcohol gives**
    A. a ketone
    B. an aldehyde
    C. an organic acid
    D. an ester
    E. an alkane

103. **Phenol is a derivate of an:**
   A. alkane
   B. alkene
   C. alkine
   D. aromatic hydrocarbone
   E. aliphatic hydrocarbone

104. **To which of the following does the acetone belong?**
   A. alcohol
   B. aldehyde
   C. carboxylic acid
   D. keton
   E. amide

105. **Which one is the formula of linoleic acid?**
   A. $H_3C(CH_2)_{14}COOH$
   B. $H_3C(CH_2)_{16}COOH$
   C. $H_3C(CH_2)_7CH=CH(CH_2)_7COOH$
   D. $H_3C(CH_2)_4CH=CHCH_2CH=CH(CH_2)_7COOH$
   E. $H_3CCH_2(CH=CHCH_2)_3(CH_2)_6COOH$

106. **Scurvy, the deficiency disease that is caused by a significant depletion of the:**
   A. D-galactose
   B. essential amino acids
   C. vitamin E
   D. cholesterol
   E. ascorbic acid

107. **To which the following does the CH_3NH_2 compound belong?**
   A. alcohol
   B. ether
   C. amide
   D. amine
   E. carboxylic acid

108. **The glycine, H_3N^+-CH_2-COOH is in this form:**
   A. at pH = 7
   B. at pH > 7
   C. at pH < 7
   D. at pH = 0
   E. at isoelectric point

109. **The structural form (shape) of proteins, called an alpha-helix is defined as:**
   A. a primary structure of proteins
   B. a secondary structure of proteins
   C. a tertiary structure of proteins
   D. a quaternary structure of proteins
   E. proteins do not form alpha-helix; that structural form is characteristic only for DNA

110. **What is correct for the sucrose?**
   A. In general it shows reactions to aldehydes.
   B. It reacts with Fehling reagent.
   C. After hydrolysis it do not show reactions to aldehydes.
   D. It can not be hydrolyzed.
   E. We can get it from the starch.

111. **The most abundant organic compound in nature is:**
   A. glucose
   B. fructose
   C. sucrose
   D. starch
   E. cellulose

112. **Which of the following compounds contains more than three nitrogen atoms?**
   A. pyrimidine
   B. uracil
   C. cytosine
   D. purine
   E. histidine

113. **In which of the following species sulphur has the highest oxidation number?**
   A. S_8
   B. SO_2
   C. SO_3
   D. H_2S
   E. SCl_2

114. **Which of the following ions hydrolyzes in an aqueous solution?**
   A. F^-
   B. Cl^-
   C. Br^-
   D. I^-
   E. $NO3^-$

115. **Which is the lowest oxidation number that can assume nitrogen?**
   A. +2
   B. +1
   C. 0
   D. -3
   E. -5

116. **Carbon monoxide is:**
   A. suffocating gas
   B. blood poison
   C. inert gas
   D. product of metabolism
   E. dry ice

117. **Select two enantiomers:**
   A. glucose and fructose
   B. α - D - glucose and β - D glucose
   C. lactose and sucrose
   D. glucose and galactose
   E. glucose and ribose

118. **The compound CH_3-OCH_2CH_3 is:**
   A. methyl ethyl ether
   B. methyl ethoxy ether
   C. ethy methoxy ether
   D. ethyl methyl ether
   E. propy ether

119. **The correct formula of the calcium oxalate is:**
   A. $Ca(C_2O_4)_2$
   B. CaC_2O_4
   C. $Ca_2C_2O_4$
   D. $(CH_3COO)_2Ca$
   E. $K_2C_2O_4$

120. **The oxidation number of sulphur in sulphuric acid is:**
   A. +2
   B. +6
   C. +4
   D. +7
   E. +8