



MDCAT PAST PAPER

SINDH MDCAT

ORIGINAL PAPER 2009

(DMC & SMC)

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APP NAME **Education in Karachi**

ENGLISH

Identify the word or phrase that needs to be changed for the sentence to be correct:

1. The stories that she makes out for her children ought to be written down and published. No error
- A B C D E
2. We are expecting to go abroad this Summer. No error
- A B C D E

Choose the word most similar in meaning to the capitalized one.

3. DISRUPTION:

- A. comfort
- B. luxury
- C. trouble
- D. freedom
- E. calm

4. INEVITABLE:

- A. doubtful
- B. deny
- C. unexpected
- D. certain
- E. unusual

Choose the lettered word or phrase that is most nearly opposite in meaning to the word in capital letters.

5. ERADICATION:

- A. suppression
- B. termination
- C. control
- D. establish
- E. extinction

6. INTERRUPTION:

- A. break
- B. continuity
- C. injury
- D. difference
- E. crack

KRI-SMC-YELLOW-011109

Read the passage to answer questions 7-8

It is of course a trifle absurd to speak of Asia as a unity, and only opposition to Western Imperialism has caused people to think in these terms. Asia contains half the population of the world and at least three very distinct civilizations: that of Islam, that of India, and that of China. These differ from each other just as much as they differ from the civilization of Christened, and there is not the faintest reason to expect them all to act in unison. What is to be hoped is, not an endeavor after cultural or political unity, but a determination to uphold independence at home and to respect it elsewhere - and when I speak of independence, I am not thinking only of politics, but also of culture. There is a great danger of too much cultural uniformity. No great civilization has ever been cosmopolitan.

7. In the view of the author, what is the harm of cultural uniformity?
- A. It will not lead to the formation of a great civilization
 - B. It will lead to the formation of a great civilization
 - C. It will lead to the formation of rich culture
 - D. It will lead to the change of environment
 - E. It will lead to the destruction of values
8. The author is in favor of
- A. Cultural uniformity
 - B. Cosmopolitanism
 - C. Political and cultural independence
 - D. Unity of Asia
 - E. None of the above

Complete the sentences by choosing the most appropriate word, from the given lettered choices (A to E) below each.

9. Life _____ water, light, a moderate **temperature** and a variety of chemical elements.
- A. finds
 - B. reveals
 - C. designs
 - D. calculates
 - E. requires
10. Nearly everyone dreams of building _____ ideal house.
- A. its
 - B. their
 - C. his
 - D. him
 - E. them

PHYSICS

11. What is the flux density at a point 3 cm from the long straight wire, when there is a current of 25 A in the wire? ($\mu_0 = 4\pi \times 10^{-7}$)

- A. 0.23×10^{-1} T
- B. 1.67×10^{-4} T
- C. 2.99×10^{-6} T
- D. 3.63×10^{-8} T
- E. 9.99×10^{-7} T

12. If an object is placed 30 cm from a convex lens whose focal length is 15 cm, the size of the image compared to the size of the object will be approximately:

- A. twice as large
- B. more than twice as large
- C. 1.5 times as large
- D. smaller
- E. the same size

13. The dimensions of volume and acceleration (respectively) are:

- A. LT^{-1} and LT^{-2}
- B. LT^{-2} and LT^{-1}
- C. L^3 and LT^{-2}
- D. $L^4 T^{-1}$ and LT
- E. LT^3 and T^2

14. A vector such as the velocity of a body undergoing uniform translational motion, which can be displaced parallel to itself and applied to any point is known as:

- A. Unit vector
- B. Free vector
- C. Null vector
- D. Position vector
- E. Resultant vector

15. A thermocouple is connected across a galvanometer of resistance 30Ω . One junction is immersed in water at 373 K and the other in ice at 273 K. The e.m.f. of the thermocouple is $90 \mu V$ for each 1 K difference in temperature between the junctions, and the thermocouple resistance is 6Ω . What current will flow in the galvanometer?

- A. $1.8 \mu A$
- B. $250 \mu A$
- C. $300 \mu A$
- D. $1.5 mA$
- E. $1.8 mA$

16. The first law of thermodynamics may be written as $\Delta U = Q + W$ Where ' ΔU ' is the increase in internal energy of the system, ' Q ' is the heat transfer to the system and ' W ' is the external work done on the system. Which of the following is correct for the case of an isothermal expansion of an ideal gas?

- A. $W > 0$
- B. $W = 0$
- C. $\Delta U = 0$
- D. $\Delta U > 0$
- E. $Q = 0$

17. A body of mass 5 kg, initially at rest, is moved by a horizontal force of 2 N on a smooth horizontal surface. Find the work done by the force in 10 s?

- A. 40 J
- B. 30 J
- C. 50 J
- D. 20 J
- E. 10 J

18. When a conductor of cross-sectional area $5.0 \times 10^{-6} m^2$ carries a current of 6.0 A, the drift velocity of the conduction electrons is $1.2 \times 10^{-4} ms^{-1}$. What is the number density (number per unit volume) of the conduction electrons?

- A. $4.0 \times 10^{-28} m^{-3}$
- B. $1.6 \times 10^{-27} m^{-3}$
- C. $2.5 \times 10^{27} m^{-3}$
- D. $6.3 \times 10^{28} m^{-3}$
- E. $1.3 \times 10^{34} m^{-3}$

19. A battery whose e.m.f. is 40 V has an internal resistance of 5Ω . If this battery is connected to a 15Ω resistor 'R', what will be the voltage drop across 'R'?

- A. 10 V
- B. 30 V
- C. 40 V
- D. 50 V
- E. 70 V

20. A particle of charge -0.04 C is projected with speed $2 \times 10^4 \text{ m/s}$ into a uniform magnetic field 'B', of strength 0.5 T. If the particle's velocity as it enters the field is perpendicular to 'B', what is the magnitude of the magnetic force on this particle?

- A. 4 N
- B. 8 N
- C. 40 N
- D. 80 N
- E. 400 N

21. A particle moves from position $\vec{r}_1 = 3\hat{i} + 2\hat{j} - 6\hat{k}$ to position $\vec{r}_2 = 14\hat{i} + 13\hat{j} + 9\hat{k}$ under the action of a force $\vec{F} = 3\hat{i} + 2\hat{j} + 6\hat{k}$. Find the work done by the force.

- A. 50 units
- B. 75 units
- C. 125 units
- D. 155 units
- E. 200 units

22. A body starts sliding on a rough horizontal surface with a speed of 10 m/s. If the coefficient of friction is 0.2, find the distance traveled by the body before coming to rest. ($g = 10 \text{ m/s}^2$)

- A. 15 m
- B. 25 m
- C. 35 m
- D. 40 m
- E. 55 m

23. An object is placed 60 cm in front of a concave spherical mirror whose focal length is 40 cm. Which of the following best describes the image?

	NATURE OF IMAGE	DISTANCE FROM MIRROR
A.	Virtual	24 cm
B.	Real	24 cm
C.	Virtual	120 cm
D.	Real	120 cm
E.	Real	240 cm

24. Due to the magnetic force, a positively charged particle executes uniform circular motion within a uniform magnetic field 'B'. If the charge is 'q' and the radius of its path is 'r', which of the following expressions gives the magnitude of the particle's linear momentum?

- A. qBr
B. $\frac{qB}{r}$
C. $\frac{q}{(Br)}$
D. $\frac{B}{(qr)}$
E. $\frac{r}{(qB)}$

25. A transverse wave on a long horizontal rope with a wavelength of 8 m travels at 2 m/s. At $t = 0$, a particular point on the rope has a vertical displacement of +A, where A is the amplitude of the wave. At what time will the vertical displacement of this same point on the rope be -A?

- A. $t = \frac{1}{8} \text{ s}$
B. $t = \frac{1}{4} \text{ s}$
C. $t = \frac{1}{2} \text{ s}$
D. $t = 2 \text{ s}$
E. $t = 4 \text{ s}$

26. An object is placed 60 cm from a spherical convex mirror. If the mirror forms a virtual image 20 cm from the mirror, what is the magnitude of the mirror's radius of curvature?

- 7.5 cm
- 15 cm
- 30 cm
- 60 cm
- 120 cm

27. The quantity of heat required to raise the temperature of one mole of a substance through 1 K, and its units are $J - mole^{-1} K^{-1}$, is called:

- A. Carnot Engine
- B. Molar specific heat
- C. Kinetic specific heat
- D. General Gas Law
- E. Boyle's Law

28. A shot leaves a gun at the rate of 160 m/s. Calculate the greatest distance to which it could be projected and the height to which it would rise? ($g = 10 \text{ m/s}^2$)

- A. 1560 m, 540 m
- B. 2560 m, 640 m
- C. 3560 m, 740 m
- D. 4560 m, 840 m
- E. 9595 m, 348 m

29. Find the unit vector parallel to the vector: $\vec{B} = 6\mathbf{i} + 12\mathbf{j} - 4\mathbf{k}$.

- A. $\hat{b} = \frac{4}{14}\mathbf{i} + \frac{12}{14}\mathbf{j} - \frac{4}{14}\mathbf{k}$
- B. $\hat{b} = \frac{6}{14}\mathbf{i} + \frac{12}{14}\mathbf{j} - \frac{4}{14}\mathbf{k}$
- C. $\hat{b} = \frac{6}{14}\mathbf{i} + \frac{17}{14}\mathbf{j} - \frac{4}{14}\mathbf{k}$
- D. $\hat{b} = \frac{6}{14}\mathbf{i} + \frac{12}{14}\mathbf{j} - \frac{9}{14}\mathbf{k}$
- E. $\hat{b} = \frac{9}{14}\mathbf{i} + \frac{12}{14}\mathbf{j} - \frac{1}{14}\mathbf{k}$



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30. The radius of the moon is 27% of the earth's radius and its mass is 1.2% of the earth's mass. Find the acceleration due to gravity on the surface of the moon.

- A. 0.431 m/s^2
- B. 1.615 m/s^2
- C. 2.431 m/s^2
- D. 3.615 m/s^2
- E. 4.431 m/s^2

31. A car covers the first half of a certain distance with a speed v_1 and the second half with a speed v_2 . Find the average speed during the whole journey?

- A. $\frac{v_1 v_2}{2(v_1 + v_2)}$
- B. $\frac{2v_1 v_2}{v_1 + v_2}$
- C. $\frac{2v_1 3v_2}{v_1 + 5v_2}$
- D. $\frac{v_1 + v_2}{5v_1 v_2}$
- E. $\frac{v_1 - v_2}{4v_1 + 9v_2}$

32. A rescue helicopter drops a package of emergency ration to a stranded party on the ground. If the helicopter is traveling horizontally at 40 m/s at a height 100 m above the ground, where does the package strike the ground relative to the point at which it was released? ($g = 9.8 \text{ m/s}^2$)

- A. 120 m
- B. 130 m
- C. 140 m
- D. 180.7 m
- E. 200.3 m

33. Two capacitors $C_1 = 2 \mu\text{F}$ and $C_2 = 4 \mu\text{F}$ are connected in series across a 100 V supply. Find the effective capacitance.

- A. $\frac{1}{2} \mu\text{F}$
- B. $\frac{3}{2} \mu\text{F}$
- C. $\frac{5}{2} \mu\text{F}$
- D. $\frac{4}{3} \mu\text{F}$
- E. $2 \mu\text{F}$

34. A car is waiting at a traffic signal and when the signal turns green, the car starts ahead with a constant acceleration of 2 m/s^2 . At the same time a bus traveling with a constant speed of 10 m/s overtakes and passes the car. How far beyond its starting point will the car overtake the bus?

- A. 40 m
- B. 30 m
- C. 90 m
- D. 120 m
- E. 100 m

35. A sample of an ideal gas occupies a volume 'V' at pressure 'P' and absolute temperature 'T'. The mass of each molecule is 'm'. If 'k' is the Boltzmann constant then the density of the gas is:

- A. mkT
- B. $\frac{P}{kT}$
- C. $\frac{P}{kTV}$
- D. $\frac{mP}{kT}$
- E. $\frac{2mPT}{k}$

36. Assume that you have two balls of identical volume, one weighing 2 newtons and the other 10 newtons. Both are falling freely after being released from the same point simultaneously. Which of the following will then be true?

- I. The 10-N ball falling freely from rest will be accelerated at a greater rate than the 2-N ball.
 - II. At the end of 4 s of free fall, the 10-N ball will have 5 times the momentum of the 2-N ball.
 - III. At the end of 4 s of free fall, the 10-N ball will have the same kinetic energy as the 2-N ball.
 - IV. The 10-N ball possesses greater inertia than the 2-N ball.
- A. I, II and III only
 - B. I and III only
 - C. II and IV only
 - D. IV only
 - E. None of the above

Questions 37-38

A battery has an e.m.f of 6.0 volts and an internal resistance of 0.4 ohm. It is connected to a 2.6 ohm resistor through a SPST (single pole, single throw) switch.

37. When the switch is open, the potential difference between the terminals of the battery is, in volts:

- A. 0
- B. 0.8
- C. 2.6
- D. 5.2
- E. 6.0

38. When the switch is closed, the potential difference between the terminals of the battery is, in volts:

- A. 0
- B. 0.8
- C. 2.6
- D. 5.2
- E. 6.0

39. A point source of light is placed at the principal focus of a concave lens. Which of the following will be true of the refracted light?

- I. It will diverge.
- II. It will be parallel to the principal axis.
- III. It will seem to come from a point $1/2$ of the radius of curvature from the lens.
- IV. It will converge.

- A. I, II and III only
- B. I and III only
- C. II and IV only
- D. IV only
- E. None of the above

40. A ball moving horizontally with speed ' v ' strikes the bob of a simple pendulum at rest. The mass of the bob is equal to that of the ball. If the collision is elastic the bob will rise to a height:

- A. $\frac{v^2}{g}$
- B. $\frac{v^2}{2g}$
- C. $\frac{v^2}{4g}$
- D. $\frac{v^2}{8g}$
- E. $\frac{v^2}{7g}$

ASIF KHAN

CHEMISTRY

41. When 18×10^{-3} moles/dm³ of acetic acid react with 22×10^{-3} moles/dm³ of ethyl alcohol to form 40×10^{-3} moles/dm³ of ethyl acetate and 40×10^{-3} moles/dm³ of water. Find the value of equilibrium constant (k_c)

- A. 4.04
- B. 3.14
- C. 3.04
- D. 2.02
- E. 1.04

42. Harmful and undesirable reaction of metal when exposed to atmosphere or any chemical agent is known as

- A. Allotropy
- B. Electroplating
- C. Collision
- D. Cracking
- E. Corrosion

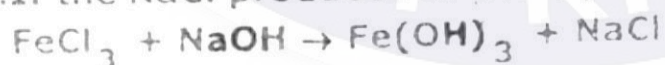
43. Given the equation:



At STP, how many liters of $\text{O}_2(\text{g})$ are needed to completely burn 5.0 liters of $\text{C}_3\text{H}_8(\text{g})$?

- A. 5.0
- B. 10
- C. 10.5
- D. 15
- E. 25

44. If the NaCl produced in the equation



was dissolved in water to make a liter of solution, the molarity would be

- A. 0.1M
- B. 3M
- C. 8M
- D. 0.5M
- E. 1.5M

45. Catenation is a process in which carbon shows the properties of

- A. Making single bond
- B. Hybridization
- C. Making long chains or rings of carbon atoms
- D. Isomerism
- E. Breaking of bonds

46. The maximum number of electrons that an orbital can accommodate is/are

- A. 0
- B. 1
- C. 2
- D. 3
- E. 4

47. Which of the following is not a nucleophile?

- A. HO^-
- B. NH_3
- C. BF_3
- D. CN^-
- E. NH_2

48. Chlorine is manufactured commercially by the electrolysis of aqueous sodium chloride (brine).

Which other products are made in this process?

- A. Hydrochloric acid and hydrogen
- B. Hydrogen and sodium
- C. Hydrogen and sodium hydroxide
- D. Sodium and sodium hydroxide
- E. Hydrochloric acid and sodium

49. Sodium reacts with water more vigorously than lithium because it

- A. Has higher atomic weight
- B. Is more electronegative
- C. Is more electropositive
- D. Is a metal
- E. Has high melting point

50. The crystals formed as a result of Vander waal's interactions are

- A. Molecular crystals
- B. Covalent crystals
- C. Metallic crystals
- D. Ionic crystals
- E. None of the above

51. Which of the following statements about H_2S is false?

- A. It is a covalent compound
- B. It is a gas with bad smell
- C. It is a strong reducing agent than H_2O
- D. Its molecule is non-linear
- E. It is a weak base in water

52. The rain drop acquires spherical shape and ink spreads over blotting paper due to

- A. Surface tension
- B. Adhesive forces
- C. Viscosity
- D. Polarity
- E. Latent heat of vaporization

53. 950 torr corresponds to

- A. 3.5 atm
- B. 1 atm
- C. 3 atm
- D. 1.25 atm
- E. 2.25 atm

54. The enthalpy change accompanying the gain of an electron by a neutral gaseous atom to form negative ion is called

- A. Ionization potential
- B. Electronegativity
- C. Electron affinity
- D. Lattice energy
- E. Potential energy

55. Sigma bond is formed by:

- A. Transferring the electrons
- B. Head on overlapping of atomic orbitals
- C. Mutual but unequal sharing of electrons
- D. parallel overlapping of atomic orbitals
- E. All of the above

56. The heat of a reaction can be calculated by using

- A. Joule's law
- B. Ohm's law
- C. Hess's law
- D. Faraday's law
- E. Boyle's law



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57. What is the product of both fermentation reactions and fractional distillation?

- A. an ester
- B. an acid
- C. an alcohol
- D. a soap
- E. a base

58. During condensation polymerization, two **monomers** may be joined by the removal of a molecule of

- A. carbon dioxide
- B. hydrogen
- C. oxygen
- D. water
- E. none of the above

59. Which gas is likely to deviate most from ideal gas behavior?

- A. HCl
- B. He
- C. CH₄
- D. N₂
- E. O₂

60. Purification of bauxite whose major impurity is Silica (SiO₂) is carried out through _____.

- A. Baeyer's method
- B. Hall's method
- C. Serpek's method
- D. Contact method
- E. Electrolytic method

61. The range of pH below _____ and above _____ of soil represent its sterility.

- A. 5 ... 10
- B. 10 ... 5
- C. 3 ... 10
- D. 10 ... 3
- E. 5 ... 3

62. According to law of mass action, "The rate of chemical reaction is proportional to

- A. Products
- B. Product of molar concentration of reactants
- C. Initial concentration of reactants
- D. Catalyst
- E. Pressure

63. For, the reaction



The production of NH_3 will be favoured at

- A. High pressure and catalyst
- B. Low pressure only
- C. Low pressure and catalyst
- D. High pressure only
- E. Catalyst only

64. The sum of exponents of the molar concentration of the reactants is equal to

- A. Molecularity
- B. Polarity
- C. Activation energy
- D. Rate of reaction
- E. Order of reaction

65. Nascent hydrogen used in the formation of methane, is obtained from the reaction of

- A. NaHCO_3 with Zn
- B. HCl with Zn
- C. KOH with Zn
- D. H_2O with Zn
- E. CH_3I with Zn

66. "zymase" a group of 14 enzymes, used in the fermentation of starch, is present in

- A. Bacteria
- B. Yeast
- C. Fungi
- D. Algae
- E. Virus

67. When an element exists in more than one crystalline form, the phenomenon is termed as

- A. Isomorphism
- B. Allotropy
- C. Isomerism
- D. Anisotropy
- E. Enthalpy

68. The formula for "Plaster of Paris", is

- A. $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
- B. $2\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
- C. $(\text{CaSO}_4)_2 \cdot \text{H}_2\text{O}$
- D. $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$
- E. $\text{Na}_2\text{SO}_4 \cdot \text{H}_2\text{O}$

69. Linear combination of atomic orbitals (LCAO) results in the formation of

- A. Sigma bond
- B. Pi bond
- C. Bonding molecular orbitals only
- D. Bonding and anti-bonding molecular orbitals
- E. All of the above

70. The general formula for aldehydes is

- A. R-OH
- B. R-COOH
- C. R-CO-R
- D. R-X
- E. R-CHO

BIOLOGY

71. The causes of Cyanosis include

- A. deficiency of vitamin C
- B. varicella-zoster virus
- C. degeneration of the cartilage of joints
- D. ventricular septum defect
- E. none of the above

72. The Prolactin hormone responsible for activation of mammary glands to start producing milk is a hormone of

- A. Pituitary gland
- B. Pancreas
- C. Thyroid gland
- D. Thymus gland
- E. Adrenal gland

73. The propulsive movement of the gastro-intestinal tract (GI tract) is

- A. Peristalsis
- B. Epiglottis
- C. Antiperistalsis
- D. Anus
- E. None of the above

74. The Calvin Cycle consists of _____ main reactions.

- A. 3
- B. 6
- C. 9
- D. 13
- E. 16

75. Identify the incorrect statement about the Bathyal zone:

- A. It ranges from surface to depth of about 2000 meters
- B. It consists of pelagic and benthic zones
- C. It is aphotic
- D. It contains producers that prepare food for consumers
- E. None of the above

76. Deamination in the liver initially produces

- A. ammonia
- B. arginine
- C. ornithine
- D. urea
- E. uric acid

77. Which of the following would be most likely to occur in an ecosystem?

- A. As the number of prey decreases, the number of predators increases.
- B. As the number of predators increases, the number of prey increases.
- C. As the number of prey decreases, the number of predators decreases.
- D. As the number of prey increases, the number of predators decreases.
- E. As the number of predators decreases, the number of prey decreases.

78. Which of the following bones are present in the palm of hand?

- A. Carpals
- B. Metacarpals
- C. Phalanges
- D. Tarsals
- E. Radius

79. Which biome contains maples, Oaks, and bears?

- A. Tundra
- B. Tropical rain forest
- C. Temperate grasslands
- D. Taiga
- E. Deciduous forest

80. The major sign and symptom of Microcephaly is

- A. Sexual defects
- B. Excessive number of toes
- C. Mental retardation
- D. Small skull in proportion to the normal body size
- E. Split in upper lip and gap in the roof of mouth

81. The reaction involved in chemotropic nutrition is

- A. $6\text{CO}_2 + 12\text{H}_2\text{O} \xrightarrow[\text{chlorophyll}]{\text{light}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{CO}_2 + 6\text{H}_2\text{O}$
- B. $2\text{H}_2\text{S} + \text{CO}_2 \xrightarrow{\text{light}} (\text{CH}_2\text{O})_n + \text{H}_2\text{O} + 2\text{S}$
- C. $\text{NH}_4^+ + 3\text{O}_2 \rightarrow 2\text{NO}_2^- + 2\text{H}_2\text{O} + 4\text{H}^+ + \text{energy}$
- D. $\text{CH}_3\text{COCOOH} \xrightarrow{\text{Enzyme}} \text{CH}_3\text{CHO} + \text{CO}_2$
- E. $5\text{GA3P} + 3\text{ATP} \rightarrow 3\text{RuBP} + 3\text{ADP} + 2\text{Pi}$

82. The muscles attached to the bones are

- A. Voluntary and smooth
- B. Involuntary and smooth
- C. Voluntary and striated
- D. Involuntary and striated
- E. Smooth and striated

83. The law of Dominance is illustrated in the garden pea by

- A. Homozygous tall x heterozygous tall
- B. Heterozygous tall x heterozygous tall
- C. Homozygous tall x Homozygous tall
- D. Pure short x pure short
- E. Homozygous tall x pure short

84. In the Hardy-Weinberg principle, $p^2 + 2pq + q^2 = 1$, q^2 represents the frequency of the

- A. Homozygous dominant
- B. Heterozygous dominant
- C. Heterozygous recessive
- D. Homozygous recessive
- E. Blended genes

85. Fungi do not contain

- A. Cell wall
- B. Hyphae
- C. Chlorophyll
- D. Mycelium
- E. Spores

86. Identify the incorrect statement about Charles Darwin's Theory

- A. The individuals of **species** have variations among them
- B. There is **always** a tendency of over reproduction in a **species**
- C. **Vast gradual changes** result in the origin of a new **species**
- D. **Favourable** variations survive and unfavorable will be **exterminated**
- E. Intra specific competition occurs between different species and inter-specific competition occurs among the individuals in a species.

87. Identify the incorrect statement from the following

- A. Apical growth increases the length of stems and roots
- B. Xylem is situated on the outer side of the cambium ring and the phloem on the inner side
- C. Secondary growth increases the diameter of stems and root
- D. The cells in elongation phase don't divide
- E. The cells in formative regions are closely packed together

88. According to _____ protein layers are not confined to the surface of the membrane but embedded in lipid layers.

- A. Lock and Key Model
- B. Induce Fit Model
- C. Fluid Mosaic Model
- D. Lotka Voltera Model
- E. All of the above

89. In a typical nucleotide the nitrogenous base is attached to _____ carbon of pentose sugar.

- A. 6th
- B. 5th
- C. 4th
- D. 3rd
- E. 1st

90. Binomial nomenclature was first time proposed by _____

- A. Charles Darwin (1859)
- B. Rodolph Virchow (1855)
- C. Louis Pasteur (1862)
- D. Carolus Linnaeus (1707)
- E. Robert Brown (1773)

91. _____ causes amoebic dysentery in humans.

- A. *Pelomyxa palustris*
- B. *Entamoeba histolytica*
- C. *Trichonympha*
- D. *Trypanosoma*
- E. *Radiolarian ooze*

92. The main process that occurs in the dark reaction in photosynthesis is

- A. That water is split
- B. Light energy is converted into chemical energy
- C. That glucose is oxidized
- D. That carbon dioxide is fixed
- E. None of the above

93. _____ is commonly known as Hook worm.

- A. *Ancylostoma duodenale*
- B. *Ascaris lumbricoides*
- C. *Enterobius vermicularis*
- D. *Hirudinaria*
- E. *Wuchereria*

94. An organism appears to be a segmented worm. Upon observation it is determined that the organism has a closed circulation, a mouth and an anus, and does not have an exoskeleton. The organism most likely belongs to the phylum

- A. Mollusca
- B. Annelida
- C. Echinodermata
- D. Arthropoda
- E. Chordate

95. The Latin words of the name given to a human being, Homo Sapiens, include the

- A. Genus and family
- B. Family and order
- C. Order and class
- D. Genus and class
- E. Genus and species

96. In paper chromatography xanthophylls will give _____ color.

- A. Orange
- B. Grey
- C. Yellow
- D. Blue-green
- E. Yellow-green

97. Ileum is about _____ long.

- A. 3.6 millimeters
- B. 3.6 centimeters
- C. 3.6 inches
- D. 3.6 meters
- E. 3.6 kilometers

Questions 98-100

Hemophilia is a disorder in which blood fails to clot. Saad, a male hemophiliac, marries Sara, a normal woman and together they have four children, two boys (Ahmed and Ali) and two girls (Alia and Ayesha). None of the children display the symptoms of hemophilia. Ahmed, Ali, Alia, and Ayesha all marry normal individuals and have children. None of Ahmed's or Ali's children, male or female, display symptoms of hemophilia, but the sons of Alia and Ayesha display symptoms of hemophilia while the daughters of Alia and Ayesha do not.

98. Which of the following best explains the reason that Ahmed, Ali, Alia, and Ayesha do not display symptoms of hemophilia, even though their father, Saad, is a hemophiliac?

- A. hemophilia is an X-linked disorder, and Saad can only pass on his Y chromosome
- B. hemophilia is an X-linked disorder, and even though Alia and Ayesha received a hemophiliac X chromosome from Saad, Sara gave them a normal X chromosome
- C. hemophilia is a Y-linked disorder, and therefore cannot be displayed in females
- D. hemophilia is a Y-linked disorder, and Ahmed and Ali must have received an X chromosome from Saad
- E. hemophilia is an X-linked disorder, and even though Ahmed and Ali received a hemophiliac X chromosome from Saad, Sara gave them a normal X chromosome

99. If one of Ali's daughters marries a normal man, what is the probability that one of their children will display symptoms of hemophilia?

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

100. Which of the following individuals are heterozygous for hemophilia?

- A. Saad, Ahmed, and Ali
- B. Ahmed, Ali, Alia, and Ayesha
- C. Saad and Sara
- D. Alia and Ayesha
- E. Ahmed and Ali