

- 1) Numbers are expressed in standard form called scientific notation, which employs powers of
 - a) 2
 - b) 8
 - c) 10
 - d) 16

- 2) A 1500kg vehicle has its velocity reduced from 20m/s to 15m/s in 3.0 seconds. How large was the average retarding force?
 - a) -0.5N
 - b) -1.5N
 - c) -2.0N
 - d) -3.5N

- 3) An object moving through a fluid experience a retarding force known as drag force. The drag force ____ as the speed of the object ____
 - a) Decreases ___ Decreases
 - b) Decreases ___ Increases
 - c) Increases ___ Decreases
 - d) Increases ___ Increases

- 4) The property of bending of light around obstacles and spreading of light waves into geometrical shadow of an obstacle is known as:
 - a) Diffraction
 - b) Interference
 - c) Polarization
 - d) Optical rotation

- 5) The distance between the slits in young's double slit experiment is 0.25cm. Interference fringes are formed on a screen placed at a distance of 100cm from slits. The distance of the third dark fringe from the central bright fringe is 0...59cm. What is the wavelength of the incident light?

- a) 390nm
 - b) 590nm
 - c) 690nm
 - d) 790nm
 - e) 990nm
- 6) The ratio of the angles subtended by the image as seen through the optical device to the subtended by the object at the unaided eye is known as :
- a) Magnifying power
 - b) Angular magnification
 - c) Simple magnification
 - d) Both A and B
- 7) Those waves in which the particle of medium have displacement along the direction of propagation of waves are known as :
- a) Longitudinal waves
 - b) Transverse waves
 - c) Simple waves
 - d) Electromagnetic waves
- 8) A pipe has a length of 1m. determine the frequencies of the fundamental and the first two harmonic if the pipe is opened at both end.(speed of sound in air is =340m/s)
- a) 170hz, 340hz, 510hz
 - b) 120hz, 220hz, 390hz
 - c) 90hz, 230hz, 440hz
 - d) 210hz, 410hz, 510hz
- 9) At point where the displacement of two waves cancel each other's effect. The path difference is odd integral multiple of half of the wavelength. This effect is known as :
- a) Constructive interference
 - b) Destructive interference

- c) Stationary interference
- d) Simple interference

10) A steel wire is 12mm in diameter is fastened to a log and then pulled by tractor. The length of steel wire between the log and the tractor is 11m. A force of 10000N is required to pull the log.

What is the stress in the wire?

- a) 33.12MPa
- b) 44.12MPa
- c) 66.15MPa
- d) 77.29MPa
- e) 88.46MPa

11) Identify the postulate /s which help to formulate a mathematical model of gases.

- i) A finite volume of gas consists of very large number of molecules
 - ii) The size of the molecules is much smaller than the separation between molecules.
 - iii) Molecules do not exert force on each other except during a collision
- a) I only
 - b) II only
 - c) III only
 - d) I and II only
 - e) I, II and III

12) The turbine in a system power takes steam from a boiler at 427C° and exhaust into a low temperature reservoir at 77 C°. What is the maximum possible efficiency?

- a) 10%
- b) 20%
- c) 30%
- d) 50%
- e) 70%

- 13) If a process cannot be retracted in the backward direction by reversing the controlling factors. It is a/an:
- a) Reversible process
 - b) Irreversible process
 - c) Efficient process
 - d) Entropic process
- 14) A digital system deals with quantities or variables which have only two discrete values or states. Identify examples of such quantities.
- i) A switch can be either open or closed
 - ii) A bulb can be either off or on
 - iii) A certain statement can be either true or false
- a) I only
 - b) II only
 - c) I and II only
 - d) III only
 - e) I, II and III only
- 15) The potential difference between the terminals of battery in open circuit is 2.2v. When it is connected across a resistance of 5.0ohm, the potential falls to 1.8v. What is the current of the battery?
- a) 0.36A
 - b) 2.36A
 - c) 3.39A
 - d) 4.49A
 - e) 9.71A
- 16) A platinum wire has resistance of 10ohm at 0c° and 20ohm at 273c°. What is the value of temperature coefficient of resistance of platinum?
- a) $3.66 \times 10^{-3} \text{ K}^{-1}$

- b) $4.66 \times 10^3 \text{ k}^{-1}$
- c) $6.31 \times 10^3 \text{ k}^{-1}$
- d) $7.42 \times 10^3 \text{ k}^{-1}$
- e) $9.49 \times 10^3 \text{ k}^{-1}$
- 17) What shunt resistance must be connected across a galvanometer of 50.0 ohm resistance which gives full scale deflection with 2.0mA current so as to convert it into an ammeter of range 10.0A?
- a) 105Ω
- b) 0.01Ω
- c) 2.5Ω
- d) 3.9Ω
- e) 4.7Ω
- 18) Find the radius of an orbit of an electron moving at a rate of $2.0 \times 10^2 \text{ m/s}$ in a uniform magnetic field of $1.20 \times 10^3 \text{ T}$.
- a) $3.15 \times 10^2 \text{ m}$
- b) $4.25 \times 10^{-2} \text{ m}$
- c) 9.43×10^{-2}
- d) 17.77×10^{-2}
- e) 19.91×10^{-2}
- 19) The time period of pendulum is measured to be 3.0 seconds in the inertial reference frame of the pendulum. What is its period?
- a) 1.2s
- b) 3.4s
- c) 7.7s
- d) 8.1s
- e) 9.6s
- 20) What is mass "m" of a moving object with speed 0.8c?
- a) 1.67m

- b) 3.67m
- c) 4.67m
- d) 6.67m
- e) 7.67m

21) The emission of electrons from a metal surface when exposed to light of suitable frequency is known as:

- a) Compton's effect
- b) Photoelectric effect
- c) Coulomb's effect
- d) Faraday's law
- e) Ohm's law

22) The special theory of relativity is based upon

- I) The laws of physics are same in all inertial frame
 - II) The speed of light in free space has the same value for all observers, regardless of their state of motion
- a) I only
 - b) II only
 - c) I and II only
 - d) None of above

23) What is the energy of a photon in a beam of infrared radiation of wavelength 1240nm?

- a) 1.0eV
- b) 3.0eV
- c) 5.0eV
- d) 7.0eV

24) A nucleus consists of nucleons comprising of protons and neutrons. A proton has a positive charge equal to _____ and has a mass

- a) $2.6 \times 10^{-19}C$ $3.6 \times 10^{-28}kg$

- b) $1.6 \times 10^{-19}\text{C} \dots 1.637 \times 10^{-27}\text{kg}$
- c) $3.6 \times 10^{-19}\text{C} \dots 2.111 \times 10^{-27}\text{kg}$
- d) $4.6 \times 10^{-19}\text{C} \dots 9.111 \times 10^{-27}\text{kg}$
- e) $5.6 \times 10^{-19}\text{C} \dots 8.111 \times 10^{-27}\text{kg}$

25) Identify the isotope/s of Helium

- a) ${}^3_2\text{He}$
- b) ${}^4_2\text{He}$
- c) ${}^1_5\text{He}$
- d) ${}^3_7\text{He}$
- e) Both a and b

26) The half life T of a radioactive element is that period which is _____ of the atoms decay.

- a) Nine times
- b) Double
- c) Half
- d) Four times
- e) Seven times

27) Fluorescence is the property of absorbing radiant energy of _____ frequency and re-emitting energy of _____ in the visible region of electromagnetic spectrum.

- a) Low... high
- b) High... low
- c) Low... low
- d) High... high

28) A reaction in which a heavy nucleus like that of uranium splits up into two nuclei of roughly equal size along with the emission of energy during the reaction is called as:

- a) Fission reaction
- b) Fusion reaction

- c) Counter reaction
- d) Chemical reaction

29) Identify the main type(s) of nuclear reactors

- a) Slow reactors
- b) Fast reactors
- c) Thermal reactors
- d) Both a and b

30) What is the average translational kinetic energy of molecules in a gas at temperature?

- a) $3.23 \times 10^{-21} \text{J}$
- b) $4.11 \times 10^{-21} \text{J}$
- c) $6.21 \times 10^{-21} \text{J}$
- d) $7.71 \times 10^{-21} \text{J}$
- e) $9.11 \times 10^{-21} \text{J}$

31) Macromolecules are of _____ types

- a) Three
- b) Four
- c) Five
- d) Six
- e) Seven

32) The long chains of amino acids are called

- a) Oils
- b) Polypeptides
- c) Monopeptides
- d) Proteins

33) The general formula for carbohydrates is

- a) $\text{Nn}(\text{H}_2\text{O})_n$
- b) $\text{Pn}(\text{H}_2\text{O})_n$
- c) $\text{Cn}(\text{H}_2\text{O})_n$
- d) $\text{Hn}(\text{H}_2\text{O})_n$
- e) $\text{Hn}(\text{C}_2\text{O})_n$

34) Lipids are generally defined in terms of

- a) Solubility
- b) Structure
- c) Molarity
- d) All of the above

35) As the result of increased CO_2 in the atmosphere, oceans will become more _____

- a) Alkaline
- b) Acidic
- c) Saline
- d) Cooler

36) Infrared lamps are used in restaurants and cafeterias to keep food warm. The infrared radiation is strongly absorbed by water, raising its temperature and that of the food... if wavelength of infrared radiation is assumed to be 1500nm, then the number of photons per second of infrared radiation is produced by an infrared lamp that consumes energy of the rate of 100 watt and is 12% efficient will be

- a) 4×10^{10}
- b) 9×10^{19}
- c) 11×10^{12}
- d) 15×10^4

37) When N_2 is formed from N_2 , bond order _____ and when O_2 is formed from O_2 , bond order _____

- a) Increases... increases
- b) Decreases... decreases

- c) Increases... decreases
- d) Decrease... increase
- 38) The process requiring absorption of energy is
- $F \rightarrow F^-$
 - $Cl \rightarrow Cl^-$
 - $O \rightarrow O^-$
 - $H \rightarrow H^-$
- 39) A solution of 500 ml of 0.2 KOH and 500ml of 0.2M HCl is mixed and stirred; the rise in temperature is T_1 . The experiment is repeated using 250ml of each of the solution: the temperature rise is T_2 . Which of the following is true?
- $T_1 = T_2$
 - $T_1 = 2T_2$
 - $T_1 = 4T_2$
 - $T_2 = 9T_1$
- 40) An aqueous solution of $Tl(H_2O)_6^{3+}$ appears:
- Greenish yellow in color
 - Blue in color
 - Violet in color
 - Purple in color
- 41) Amongst the following ions which has the highest paramagnetism?
- $[Cr(H_2O)_6]^{3+}$
 - $[Fe(H_2O)_6]^{2+}$
 - $[Cu(H_2O)_6]^{2+}$
 - $[Zn(H_2O)_6]^{2+}$
- 42) For A gaseous reaction. $A_2 + 2B \rightarrow 2AB$, the following rate data are obtained at 250k.

Rate of disappearance of A_2	Concern tradition of $[A_2]$	Concentration of $[B]$
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$-d[A_2] \text{mole}^{-1} \text{s}^{-1} \text{Dt}$	(Mole l_1)	(mole^{-1})
1.2×10^{-5}	0.10	0.01
4.8×10^{-5}	0.10	0.04
2.4×10^{-5}	0.20	0.01

Calculate the rate of formation of AB when $[A_2] = 0.02\text{M}$ and $[B] = 0.01\text{M}$ at 250K.

- a) $4.8 \times 10^{-5} \text{ mole } l^{-1} \text{ s}^{-1}$
 b) $4.8 \times 10^{-6} \text{ mole } l^{-1} \text{ s}^{-1}$
 c) $5.8 \times 10^{-6} \text{ mole } l^{-1} \text{ s}^{-1}$
 d) $5.8 \times 10^{-5} \text{ mole } l^{-1} \text{ s}^{-1}$
- 43) $\text{Zn(s)} + \text{Cu}^{2+}(\text{aq}) \rightarrow \text{Cu(s)} + \text{Zn}^{2+}(\text{aq})$. At 300 K , E_{cell} is 1.12V. what is the entropy change (ΔS) for the above cell reaction?
- a) 386 JK^{-1}
 b) 486 JK^{-1}
 c) 286 JK^{-1}
 d) 586 JK^{-1}
- 44) Which of the following conditions listed as leaving group and nucleophile respectively would most favour an $\text{S}_\text{N}1$ reaction
- a) I^- , Cl^-
 b) EtO^- , tosylate
 c) Tosylate, CN^-
 d) OH^- , H_2O
- 45) If 2-amino 3-methylbutane were treated with excess methyl iodide, silver oxide and water, what would be the major reaction products?
- a) Ammonia and 2 methyl – 2- butane
 b) Trimethylamine and 3 methyl-1-butane
 c) Trimethylamine and 2 methyl-2-butane

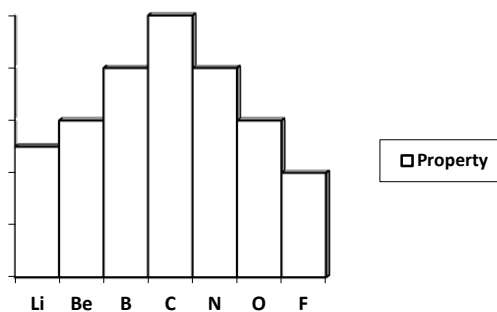
- d) Ammonia and 3 methyl - 1- butane
- 46) If an amino acid (PH=9.74) in water acidic solution is completely titrated with sodium hydroxide, what will be its charge at PH 3, 7 and 11 respectively?
- Positive , neutral , negative
 - Negative , neutral , positive
 - Neutral , positive , positive
 - Positive , positive , negative
- 47) Amino acids with non-polar R-groups have which of the following characteristics is aqueous solution?
- They are hydrophilic and found buried within the protein
 - They are hydrophobic and found buried within the protein
 - They are hydrophobic and found on protein surface
 - They are hydrophilic and found on protein surface
- 48) Part of periodic table is shown; the letters are not symbol of the elements.

Period	I	II	III	IV	V	VI	VII	0
1								
2	V	W					X	
3	Y						Z	

Which statement is correct?

- V is more relative than Y
- W has more metallic character than Y
- Y has a lower melting point than V
- Z is more reactive then X

49) The bar chart shows the period of elements from lithium to neon.



Which property of these elements is shown in the chart?

- a) The number of electron is used in bonding
- b) The number of orbits holding electrons
- c) The (protons) electronic number
- d) The relative atomic number

50) Alpha helices are secondary structures characterized by

- a) Intramolecular hydrogen bonds
- b) Disulphide bonds
- c) A rippled effect
- d) Intermolecular hydrogen bonds

51) A metal sulphate contains 9.87% of M. This sulphate is isomorphous with $ZnSO_4 \cdot 7H_2O$. Determine the atomic weight of metal M.

- a) 24.31
- b) 34.31
- c) 25.25
- d) 44.41
- e) 50.75

52) 100 cc of oxygen is collected over water at 20°C and 800mm pressure. If vapour pressure of water vapours at 20°C is 21.00mm, then calculate volume of the Gas NTP.

- a) 100cc
- b) 94.53cc
- c) 150cc
- d) 90.0cc

53) Y G of non-volatile substance (molecular mass M) is dissolved into 50 G of Benzene. If K_b is the metal elevation constant, the value of ΔT , is given by

- a) $4M/K_b \cdot Y$
- b) $4K_b \cdot Y/M$
- c) $K_b \cdot Y/4M$
- d) $K_b \cdot Y/M$

54) A mixture of ethanol and propanol has vapour pressure of 290mm at 29°C. If mole fraction of ethanol is 0.65, then what will be its vapour pressure if vapour pressure of pure propanol is 210mm?

- a) 333.1mm
- b) 441.5mm
- c) 890.2mm
- d) None of the above

55) At 25°C, the equilibrium constants K_2 in the reactions $2NH_3 \leftrightarrow N_2 + 3H_2$; K_1

$N_2 + 3H_2 = 2NH_3$; K_2 are related as

- a) $K_1 = K_2$
- b) $K_2 = 1 / K_1^2$
- c) $K_1 = 1 / K_1^2$
- d) $K_2 = 1 / K_1$

56) For the reaction $N_2 + O_2 \leftrightarrow 2NO$, the value of K is 0.0842 at 3500 K. Calculate the fraction of equilibrium mixture of N_2 and O_2 converted into NO.

- a) 15.0%

- b) 16.3%
- c) 16.5%
- d) 16.9%
- 57) Chlorine in Vinyl chloride is not very reactive because
- C-Cl bond develops partial double bonds
 - Of resonance
 - Sp² hybridized carbon has more acidic character than sp³ hybridized carbon
 - All of the above
- 58) One of the isomers of C₆ H₁₂ (A) has chiral carbon but on hydrogenation it loses its chirality. A is
- 2-methyl-2-pentene
 - 2,3-Dimethyl-2-butene
 - 3-methyl-1-pentene
 - 3,3-Dimethyl-1-butane
- 59) An equimolar quantities of ethanol and methanol are heated with conc: H₂SO₄. The product formed is
- CH₃OCH₃
 - C₂H₅OCH₃
 - C₂H₅OC₂H₅
 - All of the above
- 60) Which one of the following phenol is more soluble in aq: NaHCO₃
- 2,4-Dihydroxy acetophenone
 - 2,4,6-Tricyano phenol
 - 3,4-Dicyano phenol
 - p-Cyano phenol
- 61) A water soluble compound of molecular formula C₃H₆O gives yellow crystalline solid on heating with I₂ and Na₂CO₃, the compound is
- CH₃CH₂CHO

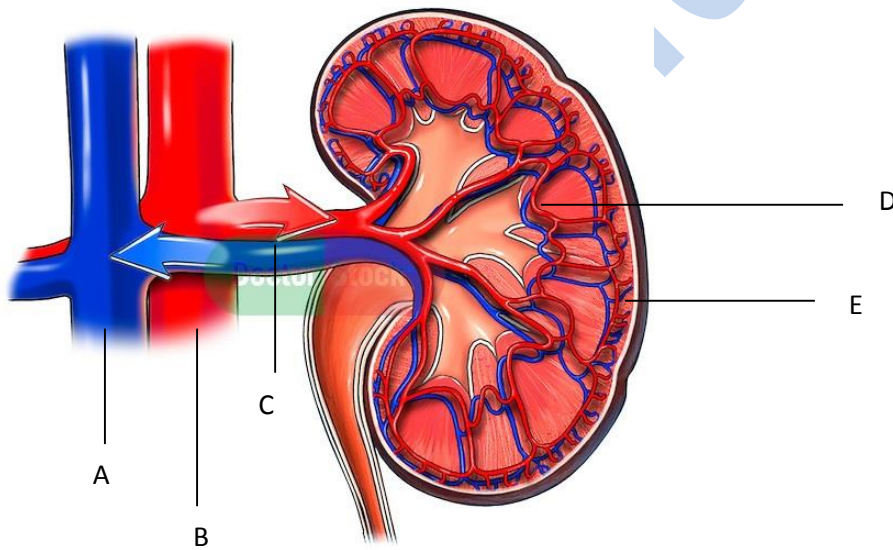
- b) $\text{CH}_2\text{OCH}=\text{CH}_2$
- c) CH_3COCH_3
- d) $\text{CH}_2=\text{CHCH}_2\text{OH}$
- 62) Arrange the following compounds in order of increasing reactivity towards the addition of HCN. Acetone(I) , Acetaldehyde (II) , methyl t-butyl ketone (III) , di-t-butyl ketone (IV)
- a) $\text{IV} < \text{I} < \text{II} < \text{III}$
- b) $\text{I} < \text{II} < \text{III} < \text{IV}$
- c) $\text{IV} < \text{III} < \text{I} < \text{II}$
- d) $\text{II} < \text{I} < \text{IV} < \text{III}$
- 63) The reaction $\text{CH}_3\text{COOAg} + \text{Br}_2 \rightarrow \text{CH}_3\text{Br} + \text{CO}_2 + \text{AgBr}$ is known as
- a) Reformatsky reaction
- b) Hunsdiecker reaction
- c) Decarboxylation
- d) Hell- Vohlhard- Zellinsky reaction
- 64) γ - butyrolactone (ester) does not react with
- a) NH_3
- b) LiAlH_4
- c) EtOH, H^+
- d) $\text{NaBH}_4 / \text{EtOH}$
- 65) Electric cookers have a coating of _____ that protects them against fire.
- a) Heavy lead
- b) Magnesium oxide
- c) Zinc oxide
- d) Sodium sulphate
- 66) The division of biology that deals with classification is
- a) Cytology

- b) Histology
- c) Botany
- d) Morphology
- e) Taxonomy

67) All the following are organelles EXCEPT the

- a) Endoplasmic reticulum
- b) Mitochondria
- c) Ribosomes
- d) Golgi complex
- e) Ultracentrifuge

68) The diagram shows sections through a kidney and associated blood vessels

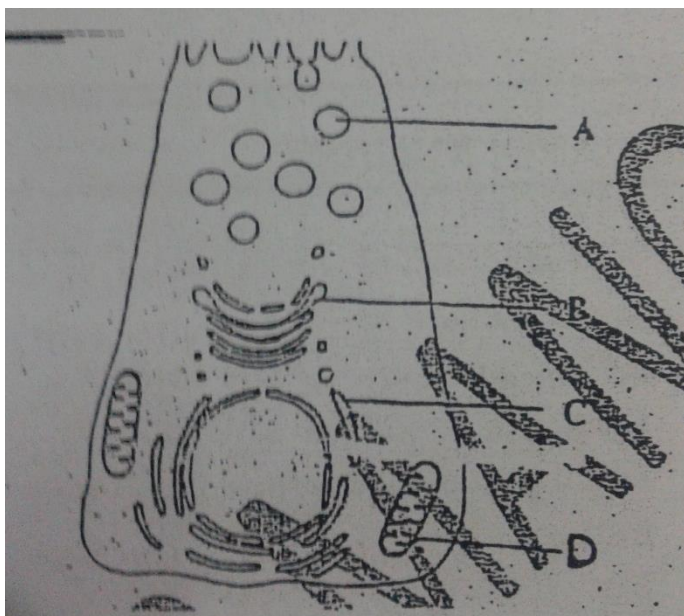


In which area is there the greatest movement of fluid from the blood through the wall of blood vessels?

- a) A
- b) B
- c) C
- d) D

e) E

69) The diagram is taken from an electron of a cell , name the organelle labeled D:



- a) Nucleus
- b) Lysosomes
- c) Golgi complex
- d) Mitochondria
- e) Endoplasmic reticulum

70) Of the following organic compounds, the one that represents a protein is

- a) $C_{12} H_{22} O_{33}$
- b) $C_6 H_{12} O_6$
- c) $C_{17} H_{14} COOH$
- d) $(C_6 H_{12} O_5)_{13}$
- e) $C_{108} H_{1130} O_{224} N_{180} S_4$

71) In which of the following the organic compound is COOH (carboxyl) group found?

- (I) Carbohydrate
- (II) Lipid
- (III) Protein

- a) I only
- b) II only
- c) I and II only
- d) II and III only
- e) I, II and III

72) Genes P, Q, R AND S occur on the same chromosome. Investigation of a large population produced the following cross over values in between pair of genes.

P and R 34%

P and Q 59%

R and S 12%

S and Q 37%

Which of the following sequence represents the sequence of genes on the chromosome?

- a) PRSQ
- b) PSRQ
- c) QSPR
- d) RQSP
- e) SPRQ

73) Which of the following kinds of atom do not occur in carbohydrates?

- a) Carbon
- b) Hydrogen
- c) Nitrogen
- d) Oxygen

74) Smooth muscle develop from

- a) Endoderm
- b) Ectoderm

- c) Mesoderm
- d) Non of above
- 75) Which cell does not carry out oxidative phosphorylation
- a) Nerve cell
- b) Cardiac cell
- c) Red blood cell
- d) None of above
- 76) RNA _____ a double stranded molecule
- a) Is
- b) Is not
- c) Is always
- d) Depending on its location is
- 77) In DNA, guanine forms a base pair with _____ while adenine forms a pair with _____.
- a) Cytosine ... thmine
- b) Thymine ... cytosine
- c) Uracil ... guanine
- d) Guanine ... uracil
- 78) An enzyme – substrate is the place where enzyme are
- a) Formed
- b) Deactivated
- c) Active
- d) Reduced
- e) Diluted
- 79) All viruses
- a) Carry DNA

- b) Carry RNA
- c) Lack protein
- d) Have chromosome
- e) Cannot reproduce outside cells

80) The correct sequence of steps in Koch's postulate is

- (I) Injecting the germ, to produce original disease
- (II) Isolating the same germ in many cases
- (III) Obtaining the original germ from infected animals
- (IV) Growing the germ in pure culture

- a) I – IV – II – III
- b) I – II – III – IV
- c) II – IV – I – III
- d) II – I – IV – III
- e) II – IV – III – I

81) The disease caused by bacteria is

- a) Small pox
- b) Rabies
- c) Polio
- d) The common cold
- e) Tetanus

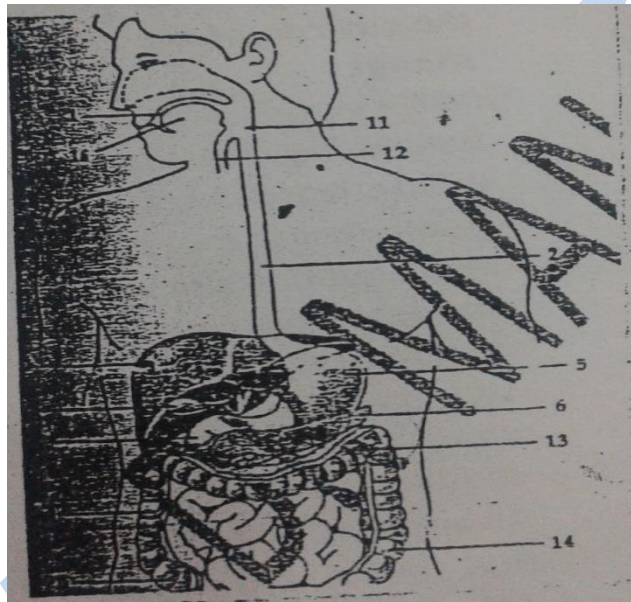
82) Fungi may be all of the following EXCEPT

- a) Heterotrophic
- b) Autotrophic
- c) Parasitic
- d) Saprophytic

- e) Decomposers
- 83) The octopus, clam and snail are alike in
- a) Having a backbone
 - b) Having joined legs
 - c) Being classified as mollusks
 - d) Being classified as vertebrates
 - e) Having a three chambered heart
- 84) Which of the following lacks vertebrates?
- a) The duckbill platypus
 - b) The turtle
 - c) The amphioxus
 - d) The trout
 - e) The rabbit
- 85) The notochord is
- a) Present in all adult chordates
 - b) Present in all echinoderms
 - c) Present in chordates during embryological development
 - d) Always a vestigial organ in chordates
- 86) Classification of organization is based on all the following except
- a) Structure
 - b) Development
 - c) Evolutionary relationship
 - d) Common ancestry
 - e) Size
- 87) Which type of mammalian cell does not carry out oxidative phosphorylation?

- a) Cardiac muscle cells
- b) Liver cells
- c) Neurons
- d) Red blood cells

QUESTIONS 88-90



88) At which site does designation of starches begin

- a) 1
- b) 2
- c) 3
- d) 4
- e) 5

89) Structure 4:

- a) Produces bile
- b) Stores bile
- c) Secretes bile
- d) Secretes bicarbonate
- e) Secretes HCl

90) Which structure is primarily responsible for water absorption during digestion

- a) 5
- b) 6
- c) 7
- d) 8
- e) 9

91) Consider the following statements about biological communities

- (I) Their members share a common gene pool
- (II) The community remains stable even though some physical aspect of environment may undergo change
- (III) They possess predictable kinds of species in predictable proportions
- (IV) Interactions between their frequent within the community than between their members and those of neighboring communities

Which two of all the above statements apply to all stable biological communities?

- a) I and II
- b) II and III
- c) I and III
- d) III and IV
- e) II and IV

92) The diagram summarizes the pathway a glucose breakdown

Hexose

↓ 1

Triose phosphate

↓ 2

Pyruvate

↓ 3

Acetyl CoA

↓ 4

6C Compound

↓ 5

H₂O + CO₂

Which two steps results in a net increases of ATP.

- a) 1 and 3
- b) 1 and 4
- c) 2 and 4
- d) 2 and 5
- e) 3 and 5

93) Which one of the following enables the mammalian kidney to regulate water re-absorption during states of dehydration?

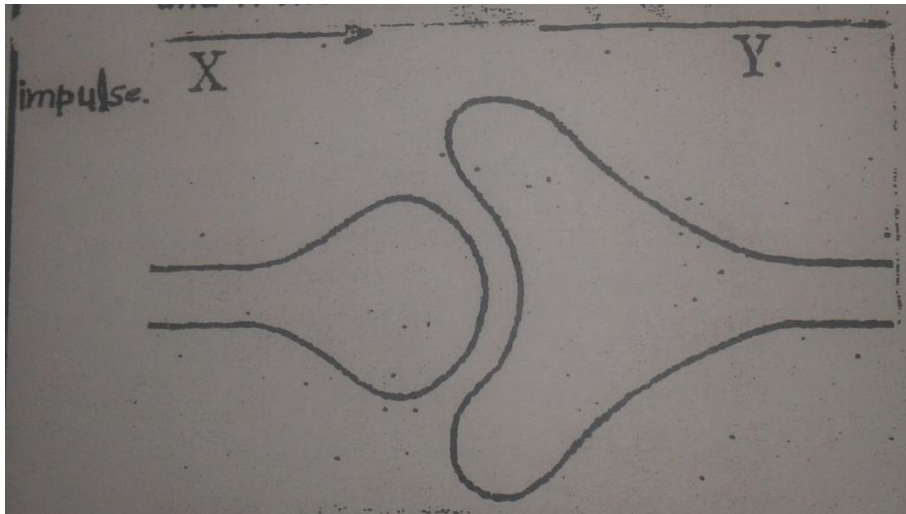
- a) the cells of the tubules detect the osmotic pressure of the blood
- b) water is extracted from the glomerular filtrate in the proximal tubule
- c) the kidney produces hypertonic urine
- d) hormones increase the permeability of the collecting ducts
- e) a low solute concentration is maintained around the collecting ducts

94) A drug reduces mitochondrial activity in nephrons of kidney. Which chemical will be present in increased amount in the urine?

- a) Ammonia

- b) Glucose
 - c) Hydrogen bicarbonate
 - d) Urea
- 95) Where, in the nephron is most glucose reabsorbed?
- a) In the ascending loop of henle
 - b) In the descending loop of henle
 - c) In the proximal (first) convoluted tubule
 - d) In the distal (second) convoluted tubule
- 96) The spinal cord serves as the center of
- a) Sub conscious thought
 - b) Reflex actions
 - c) habits
 - d) tropisms
- 97) The most abundant substance in protoplasm is
- a) Protein
 - b) Fat
 - c) Carbohydrate
 - d) Water
 - e) Minerals
- 98) The placenta releases all of the following hormones EXCEPT
- a) Progesterone
 - b) LH
 - c) hCG
 - d) estrogen

- 99) The diagram below represents the synapse between two mammalian myelinated neurons, X and Y. The arrows show the direction of



The transmission of impulses across the synapse is brought about by the:

- a) Breakdown of the terminal membrane of X
 - b) Passage of an electric current
 - c) Release of sodium ions from X
 - d) Buildup of a potential difference between X and Y
 - e) Secretion of a chemical from X
- 100) All the following organs produce hormones involved in the reproductive cycle EXCEPT the
- a) Testis
 - b) Pituitary
 - c) Pancreas
 - d) Ovary
 - e) Uterus
- 101) In human female FSH regulates the concentration of
- a) Cortisol
 - b) Estrogen

- c) Aldosterone
 - d) None of above
- 102) Reduction division occur during the process of
- a) Cleavage
 - b) Differentiation
 - c) Fertilization
 - d) Meiosis
 - e) Parthenogenises
- 103) 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
- 104) Which of the following statement regarding the periosteum is INCORRECT
- a) The periosteum serves as the site of attachment of bone to muscle
 - b) Cells of the periosteum differentiate into osteoblasts.
 - c) The periosteum is a fibrous sheath that surrounds long bones
 - d) None of the above
- 105) The most correct statement about muscle contraction is
- a) Actin moves to shorten the muscle
 - b) Cross bridges connecting the two molecule of myofibril is made up of G –Actin
 - c) Contraction of myosin molecule results in muscle contraction
 - d) K^+ is necessary for binding of cross bridges
- 106) The absorption and use of calcium are regulated by

- a) Paratharmone
 - b) Adrenaline
 - c) Thyroxin
 - d) Thiamin
 - e) Prolactin
- 107) On a very cold day, a man waits for over an hour at the bus stop. Which of the following structures helps his body set and maintain a normal body temperature
- a) Hypothalamus
 - b) Kidneys
 - c) Heart
 - d) Brain stem
- 108) Which hormone triggers your body to retain NaCl, especially during periods of excessive heat?
- a) Aldosterone
 - b) Progestrone
 - c) ACTH
 - d) Epinephrine
 - e) Testosterone
- 109) Which of the following is true regarding passive and active immunity?
- a) Active immunity requires weeks to build, where as passive immunity is acquired immediately
 - b) Active immunity is short lived, whereas passive immunity is long lived
 - c) Active immunity may be acquired during pregnancy through placenta
 - d) Passive immunity may be acquired through vaccination
- 110) Which of the following is NOT an example of non –specific defense mechanism?
- a) Skin provides a physical barrier against invasion
 - b) Macrophages engulf and destroy foreign particles

- c) An inflammatory response to physical damage
 - d) Cytotoxic T cells destroy foreign antigens
- 111) When B –cells are presented with antigen they differentiate into
- a) T cells
 - b) Helper T cells
 - c) Plasma cells
 - d) Bursa cells
- 112) During which of the following processes is ATP produced?
- (I) Photosynthesis
 - (II) Aerobic respiration
 - (III) Anaerobic respiration
- a) I only
 - b) II only
 - c) I and II only
 - d) II only III only
 - e) I, II and III
- 113) Structures that conduct materials throughout a plant are called
- a) Lenticles
 - b) Meristem
 - c) Fibrovascular bundles
 - d) Cambium
 - e) Epidermis
- 114) Given plants carry on respiration
- a) Only during the day
 - b) Only at day

- c) During both day and night
 - d) Only when photosynthesis is going on
 - e) Only when photosynthesis is not going on
- 115) Photophosphorylation during photosynthesis results in the formation of
- a) ATP
 - b) NAD
 - c) FAD
 - d) ADP
- 116) Which of the following has evolved mainly as a result of artificial selection?
- a) Darker coloring of prepared moth near industrial areas
 - b) Increased production of antibiotics by the fungus penicilium species
 - c) Increased resistance of houseflies to the insecticide DDT
 - d) Increased resistance of lichens to the heavy metals on tree bark around mine workings
- 117) The technique of DNA fingerprinting has been used to identify people in crime, accidents, and family relationships. In order to analyze the DNA of members of the same family, it is necessary to examine samples of their tissues for
- a) Similarities in the nucleotide uracil
 - b) Similarities in the deoxyribose sugar
 - c) Similarity in nucleotide base pairs
 - d) Similarities in nucleotide base pairs
 - e) RNA differences
- 118) Five stages in the production of human insulin by genetic engineering techniques are given
1. DNA cut with restriction enzymes
 2. DNA copy made using reverse transcriptase
 3. Messenger RNA extracted from cells
 4. Plasmid RNA joined to donor DNA using ligase enzymes

5. Recombinant plasmid inserted into bacterial cell

Which sequence is correct?

First -----→ Last

- a) 1→3→2→5→4
 - b) 1→3→4→2→5
 - c) 2→1→3→2→5
 - d) 3→2→1→4→5
- 119) All of the following statements about tropical rain forests are true EXCEPT
- a) They regulate the global climate of entire planet
 - b) Through photosynthesis they give off great quantities of carbon dioxide
 - c) They contribute perhaps 50% of the rainfall in the amazon area
 - d) They contain countless thousands of species of plants and animals
 - e) Their soil is comparatively infertile
- 120) What are edaphic factors in the environment concerned with
- a) Animals
 - b) The soil
 - c) The climate
 - d) Wave action
 - e) Fire
- 121) A cross in which three fourths of the offspring appear dominant is
- a) Tt x TT
 - b) TT x tt
 - c) Tt x tt
 - d) Tt x Tt
 - e) TT x TT

122) Of the following the combination of bases that cannot be present in DNA is

- a) AUCG
- b) ATCG
- c) ATTA
- d) CGTA
- e) GCAT

123) Plants and animals cells are alike in processing

- a) Chlorophyll
- b) Chloroplast
- c) Cell wall
- d) Cellulose
- e) Cell membrane

124) Which of the following choices correctly shows structures which are found in eukaryotic cell?

(v= present , x= absent)

	Nuclear membrane	Mitochondria	ribosomes
a)	x	x	X
b)	X	v	X
c)	v	X	x
d)	v	X	v
e)	v	v	v

125) Which one of the following types of bond is principally concerned in maintaining the alpha helix shape of secondary protein structure?

- a) Disulphide bonds
- b) Peptide bonds
- c) Ester bonds

- d) Phosphate bonds
- e) Hydrogen bonds
- 126) Which class of molecule is the major component of cell membrane
- a) Phospholipid
- b) Cellulose
- c) Wax
- d) Triglyceride
- 127) Energy can be made available to the body in the following ways
- (I) Conversion of surplus aminoacids and glycerol to blood glucose and mobilization of fat deposits which pass to the tissue for oxidation
- (II) Breakdown of liver and muscle glycogen to form glucose
- (III) tissue protein to release aminoacids which are then converted into glucose
- in which order does the body draw on potential energy when it is being starved of food?
- a) I→II→III
- b) I→III→II
- c) II→I→III
- d) II→III→I
- e) III→I→II
- 128) The autonomic nervous system controls all of the following activities EXCEPT
- a) Secretion of digestive juices
- b) Peristalsis
- c) Sweating
- d) Thought
- 129) The nucleus contains all of the following structures except
- a) Mitochondria

- b) Chromatin
 - c) Genes
 - d) Nucleolus
 - e) Nuclear membrane
- 130) Which of the following choices INCORRECTLY pairs a digestive enzyme with its secretion?
- a) Pancreatic amylase → pancreas
 - b) Aminopeptidase → stomach
 - c) Enterokinease → intestinal glands
 - d) Maltase → intestinal glands