

**DOW MEDICAL COLLEGE UNIVERSITY KARACHI.****ENGLISH:**

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

1. I go the post office every morning on my way too work. No error  
A                      B                      C                      D                      E
2. The secretary must type these letters before lunch. No error  
A                      B                      C                      D                      E

**CHOOSE THE LETTERED WORD OR PHRASE THAT IS MOST NEARLY OPPOSITE IN MEANING TO THE WORD IN CAPITAL LETTERS.**

3. BLAZE:
  - a) Quench
  - b) Burn
  - c) Rage
  - d) Shine
  - e) Flame
4. GRIEVE:
  - a) Disturb
  - b) Hurt
  - c) Dirge
  - d) Feel sad
  - e) Rejoice

Choose the word most similar in meaning to the oapitalized ones.

5. SQUASH:
  - a) Squeeze
  - b) Beat
  - c) Evolution
  - d) Pace
  - e) Rapidity
6. GENTLE:
  - a) Rough
  - b) Expert
  - c) Heartless
  - d) Calm
  - e) Wicked

Question 7-8 are based on the following passage.

However, it must be recognized that science has its limitations. Its methods apply only to those things which can observed, measured, and treated mathematically. It has nothing to do with

values-save those of the truth and accuracy. It has nothing to do with happiness, goodness, beauty, courage, adventure, justice, altruism, friendship, love of family, love of country. Yet all these values enter into a man's conception of what is the good personal life within a good society. It is possible for honest and intelligent men to differ profoundly on the nature of these values and their respective degrees of importance. Hence the contract between the modern world's command of material things and its tragic failure to organize a harmonious world society.

7. It can be inferred from the passage that the author thinks:
- Science to be necessary element of a good personal life.
  - Science brings happiness, goodness, beauty, courage, adventure, justice, altruism, friendship, love of family and love of country to a man's life
  - Science has successfully brought a balance between modern world's command of material things and a harmonious world society
  - A good personal life can be achieve by recognizing the nature of values and their degree of importance
  - The limitations of science are negligible
8. According to the paragraph science applies certain values, which of the following describes these values?
- Truth and justice
  - Love of country and accuracy
  - Truth and accuracy
  - Justice and accuracy
  - Truth and love of country

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

9. He says he is a \_\_\_\_\_ but he can't play the piano or any other instrument and he can't sing.
- Musician
  - Magician
  - Physician
  - Dietician
  - Technician
10. I \_\_\_\_\_ have to get up early tomorrow morning.
- Shall
  - Would
  - Had
  - Could
  - Am

**PHYSICS:**

11. A constant force acting on a body of mass 5 kg changes its speed from 2 m/s to 7 m/s in 10s the direction of motion of the body remains unchanged. Find the magnitude of the force.

(Take  $g=10m/s^2$ )

- a) 0.5 N
- b) 1.5 N
- c) 2.5 N
- d) 3.5 N
- e) 4.5 N

12. What force should be applied on a 10 kg body so that it moves down in vacuum with an acceleration of  $3 m/s^2$ ? ( Take  $g=9.8 m/s^2$ )

- a) 42 N
- b) 46 N
- c) 48 N
- d) 53 N
- e) 58 N

13. Candela is the luminous intensity, in the perpendicular direction of a surface \_\_\_\_\_ square meter of a black body at the temperature of freezing platinum under a pressure of 101325 newton per square meter.

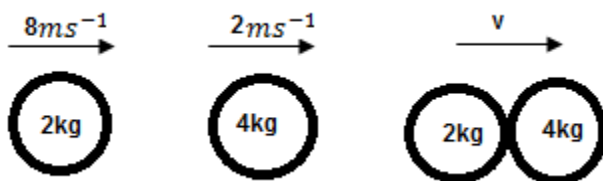
- a) 1/300000
- b) 1/600000
- c) 1/900000
- d) 1/200000
- e) 1/500000

14. The work done in moving an object along a straight line from (3,2,-1) to (2,-1,4) in a force field which is given by

$$F=4i - 3j + 2k, \text{ is}$$

- a) 45
- b) 35
- c) 25
- d) 15
- e) 5

15. A ball of mass 2 kg travelling at  $8 ms^{-1}$  strikes a ball of mass 4kg travelling at  $2 ms^{-1}$ . Both balls are moving along the same straight line as shown.

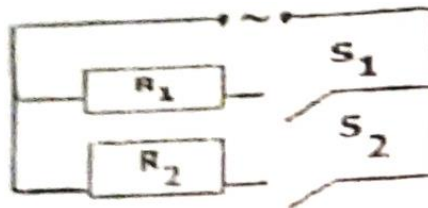


After collision, both balls move at the same velocity  $v$ . what is magnitude of the velocity  $v$ ?

- a)  $4 \text{ ms}^{-1}$
  - b)  $5 \text{ ms}^{-1}$
  - c)  $6 \text{ ms}^{-1}$
  - d)  $8 \text{ ms}^{-1}$
  - e)  $10 \text{ ms}^{-1}$
16. On the ground, the gravitational force on a satellite is  $W$ . what is the gravitational force on the satellite when at a height  $R/50$ , where  $R$  is the radius of the earth?
- a)  $1.04 W$
  - b)  $1.02 W$
  - c)  $0.98 W$
  - d)  $0.96 W$
  - e)  $2.13 W$
17. When the air craft Condore is moving in a horizontal plane at a constant speed of  $650 \text{ ms}^{-1}$ , its turning circle has a radius of  $80 \text{ km}$ . what is the ratio of the centripetal force to the weight of the air craft? ( $g=9.8 \text{ ms}^{-2}$ )
- a)  $8.3 \times 10^4$
  - b)  $0.54$
  - c)  $1.9$
  - d)  $52$
  - e)  $540$
18. The amount of heat at constant volume is called as:
- a) Internal energy
  - b) Enthalpy
  - c) Entropy
  - d) Temperature
  - e) Pressure
19. A parallel beam of white light is incident normally on a different grating. It is noted that the second-order and third-order spectra partially overlap. Which wavelength in third-order spectrum appears at the same angle as the wavelength of  $600 \text{ nm}$  in the second order spectrum?
- a)  $300 \text{ nm}$
  - b)  $400 \text{ nm}$
  - c)  $600 \text{ nm}$
  - d)  $900 \text{ nm}$
  - e)  $950 \text{ nm}$
20. If the frequency of a pendulum is four times greater on an unknown planet that it is on earth, then the gravitational constant on that planet is:
- a) 16 times greater
  - b) 4 times greater
  - c) 4 times lower
  - d) 16 times lower
  - e) 24 times lower

21. A submarine sends out a sonar signal (sound wave in a direction directly downward). It takes 2.3 s for the sound wave to travel from the submarine to the ocean bottom and back to the submarine. How high (approx) up from the ocean floor is the submarine? (the speed of sound in water is 1,490 m/s)
- 1,700 m
  - 3,000 m
  - 5,000 m
  - 9,000 m
  - It cannot be determine from the information given
22. A 40 kg block is resisting at a height of 5 m of the ground. If the block is released and falls to the ground, what is the total energy at a height of 2 m? ( $g=ms^{-2}$ )
- 0 J
  - 400 J
  - 2 J
  - 6 KJ
  - It cannot be determined from the information given
23. The internal energy of an object increases in an adiabatic process. Which of the following must be true regarding this process?
- The kinetic energy of the system is changing
  - The potential energy of the system is changing
  - Work is done on the system
  - Heat flows into the system
  - No work is done on the system
24. An electric rod of 2000 watts rating boils a certain quantity of water in 10 minutes, the heat which is generated for boiling this water is:
- $8 \times 10^4$  joules
  - $12 \times 10^5$  joules
  - $19 \times 10^5$  joules
  - $23 \times 10^5$  joules
  - $37 \times 10^5$  joules
25. A nucleus consist of 19 protons and 20 neutrons. The conventional symbol of this neclar is :
- ${}_{11}\text{NA}^{12}$
  - ${}_{19}\text{K}^{19}$
  - ${}_{19}\text{K}^{39}$
  - ${}_{19}\text{K}^{20}$
  - ${}_{12}\text{Na}^{12}$
26. The linear magnification produced by a lens is defined as the ratio of the:
- Size of image to the size of object
  - Size of the lens to the size of the object
  - Size of the lens to the size of the image
- I only
  - II only

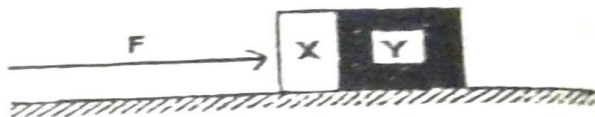
- c) III only  
 d) II and III only  
 e) I, II and III
27. Gamma ( $\gamma$ ) ray can produce ionization in which of the following way/s?
- It may lose all its energy in a single encounter with electron of an atom (Photoelectric effect).
  - It may lose only a part of its energy
  - Very few of very high energy ( $\gamma$ ) ray photons may impinge directly on heavy nuclei, be stopped and annihilated giving rise to rise to electron-positron pairs (The materialization of energy)
    - I only
    - II only
    - III only
    - [I and III only] I, II and III
28. The half-life of  $C^{14}$  is approximately 5,730 years, while the half-life of  $C^{12}$  is essential infinite. If the ratio of  $C^{14}$  to  $C^{12}$  in a certain sample is 25% less than the normal ratio in nature, how old is the sample?
- Less than 5,730 years
  - Significantly greater than 5,730 years, but less than 11,460 years
  - Approximately 11,460 years
  - Approximately 15,730
29. Which of the following statements is not consistent with Bohr's set of postulates regarding the hydrogen atom model with regard to the emission and absorption of light?
- Energy levels of the electrons are stable and discrete.
  - An electrons emits or absorbs radiation only when making a transition from one energy level to another.
  - To jump from a lower energy to a higher energy, an electron must absorb s photon of precisely the right frequency such that the photon's energy equals the energy difference between the two orbits.
  - To jump from a higher energy to a lower energy, an electron absorbs a photon of a frequency such that photon's energy is exactly the energy difference between the two orbits
  - None of the above
30. An electric heater can be represented as two resistor of resistance  $R_1$  and  $R_2$  two switches  $S_1$  and  $S_2$  the resistance  $R_2$  is greater than that  $R_1$ .



Which switch must be closed so that the heater produces the maximum possible power and minimum non-zero power?

MAXIMUM POSSIBLE POWER, MINIMUM NON-ZERO POWER

- |                    |       |
|--------------------|-------|
| a) $S_1$ and $S_2$ | $S_2$ |
| b) $S_1$ and $S_2$ | $S_1$ |
| c) $S_1$           | $S_2$ |
| d) $S_2$           | $S_1$ |
| e) $S_1$           | $S_1$ |
31. The temperature of a body at  $100^\circ\text{C}$  is increased by  $\Delta\theta$  as measured on the Celsius scale. How is the temperature change expressed on the Kelvin scale?
- $\Delta\theta + 373$
  - $\Delta\theta + 273$
  - $\Delta\theta + 100$
  - $\Delta\theta$
  - $\Delta\theta + 212$
32. In an astronomical telescope, the distance between objective and eye piece is called:
- Magnifying power of the telescope
  - Width of the telescope
  - Length of the telescope
  - Height of the telescope
  - Diameter of the line of the telescope
33. A special class of waves which do not need a material medium for their propagation are called:
- Electric waves
  - Magnetic waves
  - Electromagnetic waves
  - Earthquake's shock
34. Two blocks, X and Y, of masses  $m$  and  $2m$  respectively, are accelerated along a smooth horizontal surface by a force  $F$  applied to block X, as shown in the diagram



What is the magnitude of the force by block Y and X during this acceleration?

- 0
- $F/2$
- $F/2$
- $2F/3$
- $F$

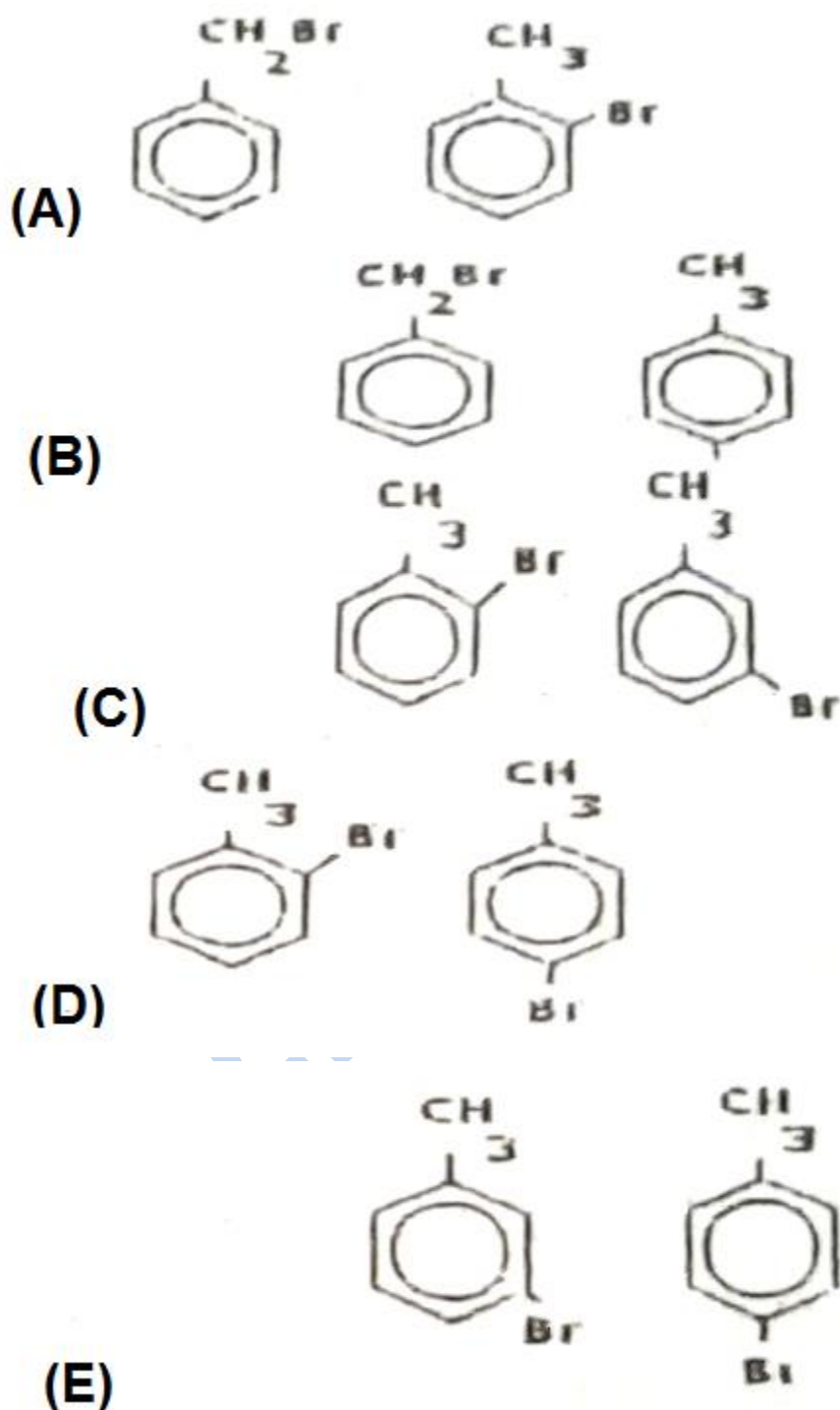
35. A box of mass  $m=6\text{kg}$  slides with speeds  $v=4\text{ m/s}$  across a frictionless floor. It suddenly explodes into two pieces one piece, with same mass  $m_1 = 3\text{kg}$  moves in the same direction with speed  $v = m/s$ . find the velocity of the second piece.
- 2 m/s
  - 4 m/s
  - 8 m/s
  - 9 m/s
  - 11 m/s
36. A generator of e.m.f. 80 V has no internal resistance of  $0.04\ \Omega$ . If its terminal voltage is 75 V, determine the current
- 125 A
  - 135 A
  - 145 A
  - 155 A
  - 165 A
37. A block of mass 50 kg is pulled on a frictionless floor by force of 210 N directed at  $30^\circ$  to the horizontal. If the block moves 3.0 m, what is the work done on it by the applied force?
- $115\sqrt{2}\text{J}$
  - $215\sqrt{2}\text{J}$
  - $315\sqrt{2}\text{J}$
  - $415\sqrt{2}\text{J}$
  - $515\sqrt{2}\text{J}$
38. A 4 cm high object is located 10 cm from the converging lens, whose focal length is 20 cm. the image so formed will be:
- Virtual
  - Erect
  - Real
  - Inverted
  - Both A and B
39. A rotating wheel of radius 0.5 m has an angular velocity of 5 Rad/s at some instant and 10 rad/s after 5 s. find the angular acceleration of a point on its rim.
- $1\text{ rad/s}^2$
  - $3\text{ rad/s}^2$
  - $5\text{ rad/s}^2$
  - $7\text{ rad/s}^2$
  - $9\text{ rad/s}^2$
40. A shot leaves a gun at the rate of 160 m/s. calculate the greatest distance to which it could be projected. (Take  $g=10\text{ m/s}^2$ )
- 2460 m
  - 2560 m
  - 2680 m



- d) 2760 m
- e) 2860 m

**CHEMISTRY:**

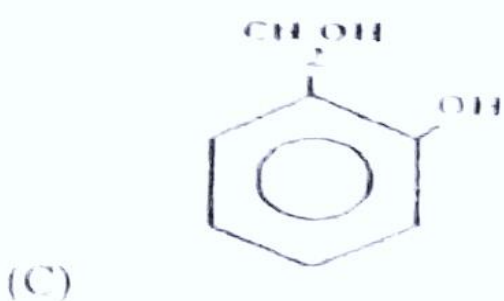
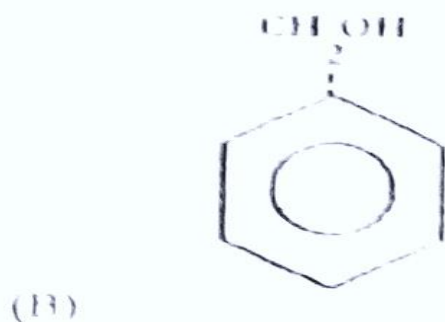
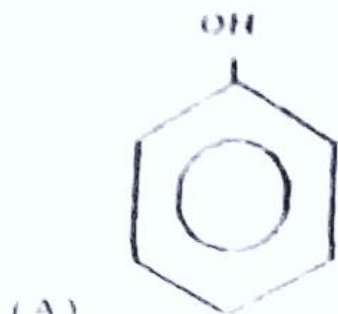
41. A system at equilibrium can be disturbed by:
- a) Concentration change
  - b) Pressure change
  - c) Temperature
  - d) All of above
42. Among the following electrons, which has highest energy?
- a)  $N = 3, l = 2, m = 0, s = +1/2$
  - b)  $N = 4, l = 0, m = 0, s = +1/2$
  - c)  $N = 3, l = 1, m = 1, s = -1/2$
  - d)  $N = 3, l = 0, m = 0, s = -1/2$
43. Equals weights of methane and hydrogen are mixed in an empty container at  $25^{\circ}\text{C}$ . The fraction of total pressure exerted by hydrogen is:
- a)  $1/2$
  - b)  $8/9$
  - c)  $1/9$
  - d)  $16/17$
44. In the final answer of the expression:  $(29-20.2)(1.78 \times 10^5)/1.37$  the number of significant figure is:
- a) 1
  - b) 2
  - c) 3
  - d) 4
45. If we take 2.2 grams of  $\text{CO}_2$ ,  $6.02 \times 10^{21}$  atoms of nitrogen and 0.03 gram atoms of sulphur, then the molar ratio of C, N and O atoms will be:
- a) 1:2:5
  - b) 5:1:2
  - c) 2:5:3
  - d) 5:1:3
46. When methyl benzene is treated with bromine in the presence of a catalyst, a mixture of two monogram isomers is formed. What are the structures of these two isomers?

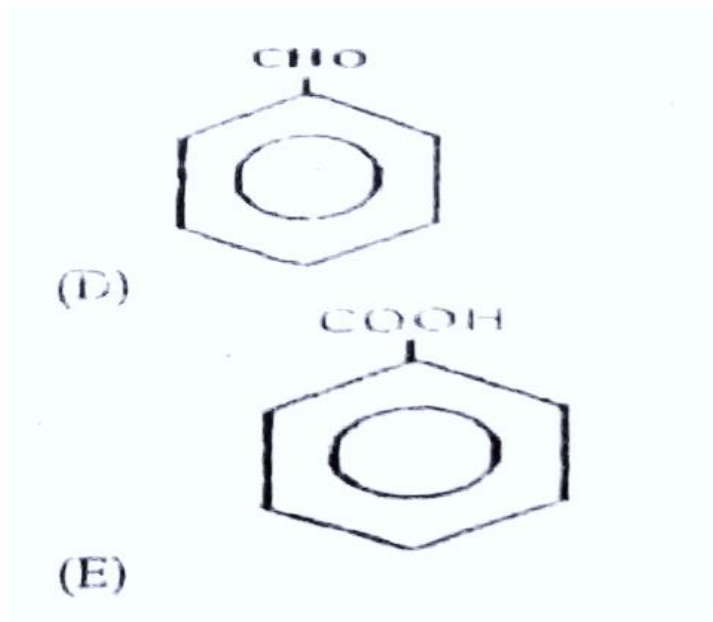


47. The series limit for the balmer series of hydrogen spectrum occurs at 3664 Å. calculated ionization energy of hydrogen atom.

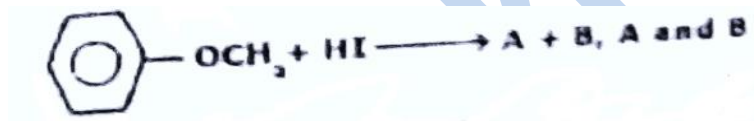
- $21.7 \times 10^{-19} \text{J}$
- $6.626 \times 10^{-34} \text{J}$
- $5.425 \times 10^{-19} \text{J}$
- $3664 \times 10^{-10} \text{J}$





- e)  $3 \times 10^8 J$
48. Which one of the following formulae represents the organic compound formed when methyl benzene is heated under reflux with alkaline potassium manganate (VII) solution and the mixture then acidified?





49.



- A)  I, CH<sub>3</sub>OH
- B)  OH, CH<sub>3</sub>I
- C)  CH<sub>3</sub>I
- D)  I, CH<sub>3</sub>

50. The false statement about lithium is:

- It is softer than other alkali metals
- It is least reactive
- It possesses higher melting and boiling points
- It forms chloride which is soluble in alcohol

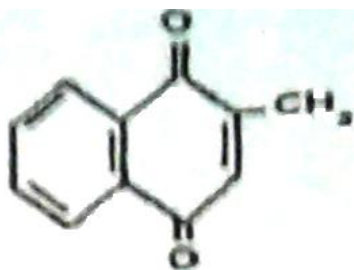
51. Diamond and graphite:

- Are isotopes

- b) Are isomers
  - c) Are allotropes
  - d) Have the same structure
  - e) Are equally hard
52. Borax exists in nature as:
- a)  $Na_2 B_4 O_7 \cdot 10H_2O$
  - b)  $Na_2 B_4 O_7 \cdot 7H_2O$
  - c)  $Na_2 B_4 O_7 \cdot 5H_2O$
  - d)  $Na_2 B_4 O_7 \cdot 3H_2O$
  - e)  $Na_2 B_4 O_7 \cdot H_2O$
53. An outer transition elements belong to:
- a) S-block
  - b) P-block
  - c) D-block
  - d) F-block
  - e) None of the above
54. Transition elements have coloured compounds because:
- a) Their bond energy is low
  - b) They easily absorb energy
  - c) Splitting of the five degenerated d-orbitals take place
  - d) D-orbitals are very close to p-orbitals
  - e) Degenerate p-orbitals are present
55. In a double-bonded carbon atom (C=C):
- a) Hybridization occurs between the s-orbitals and p-orbitals
  - b) Hybridization occurs between the s-orbitals and two p-orbitals
  - c) Hybridization occurs between the s-orbitals and three p-orbitals
  - d) No hybridization occurs between the s- and p-orbitals
  - e) Hybridization occurs between the s-orbitals and two p-orbitals
56. The radii of the second orbit of the hydrogen atom calculated from bohr's model is :
- a)  $0.529 \text{ \AA}$
  - b)  $4.8 \text{ \AA}$
  - c)  $2.41 \text{ \AA}$
  - d)  $3.4 \text{ \AA}$
  - e)  $1 \text{ \AA}$
57. The amount of energy release by absorbing an electron in valence shell is:
- a) Ionization energy
  - b) Electron energy
  - c) Electro negativity
  - d) Atomic radius
  - e) Atomization
58. Rate =  $k [N_2O_5]$  has \_\_\_\_\_ of reaction.
- a) First order
  - b) Pseudo first order

- c) Second order  
 d) Third order  
 e) Pseudo order
59. Which one of the following molecules has shortest distance of carbon atoms?  
 a)  $\text{CH}_3\text{-CH}_3$   
 b)  $\text{CH}_2 = \text{CH}_2$   
 c)  $\text{CH} = \text{CH}$   
 d)  $\text{CH}_3\text{-CH}_2\text{-CH}_3$   
 e)  $\text{CH}_2 = \text{CH}_2\text{-CH}_3$
60. The most dense element is:  
 a) Li  
 b) K  
 c) Ca  
 d) Ba  
 e) Rb
61. The isomers must have the same:  
 a) Physical properties  
 b) Molecular formula  
 c) Structural formula  
 d) Chemical properties  
 e) Both B and C
62. For a reaction  $2\text{A} + \text{B} \longrightarrow \text{C} + \text{D}$  the active mass of B is kept constant and that of A is tripled. It is observed that the rate of reaction  
 a) Decrease three times  
 b) Decreases nine times  
 c) Increases six times  
 d) Increases nine times

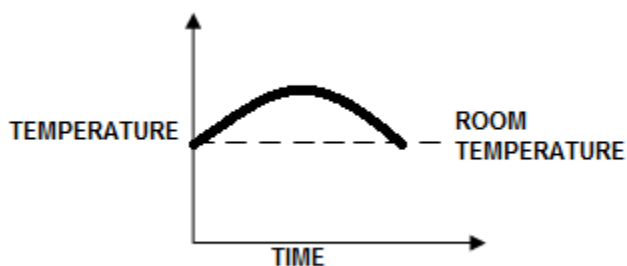
63.



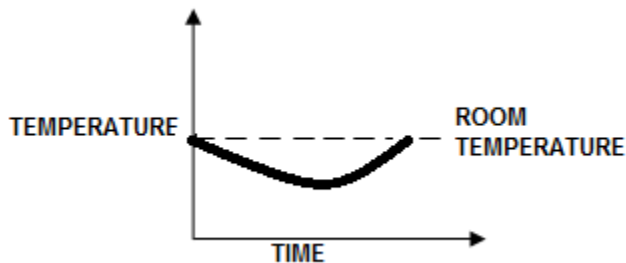
Is a structure of?

- a) Menadoine  
 b)  $\alpha$  - tocopherol  
 c) Calciferol  
 d) Thiamine  
 e) Pyridoxine
64. From a mixture of  $\text{CO}_2$  and  $\text{H}_2$  gases,  $\text{CO}_2$  can be separated by passing the mixture through:  
 a) Water at high temperature

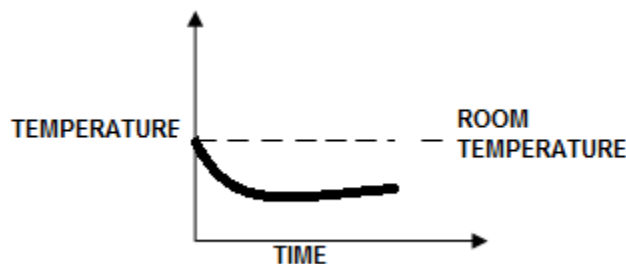
- b) Water under high temperature
  - c) Cold water
  - d) Acidified water
65. Which type of isomerism depends on distribution of carbon atoms on each side of functional group?
- a) Structural isomerism
  - b) Functional isomerism
  - c) Chain isomerism
  - d) Metamerism
66. Alkanes having five to seventeen carbon atoms per molecule are:
- a) Liquids
  - b) Solids
  - c) Gases
  - d) Semi solid wax
67. Dissolution of ammonium nitrate in water is an endothermic process. Which of the following graphs shows how the temperature varies as the ammonium nitrate is added to water and then the solution is left at room temperature?
- a)



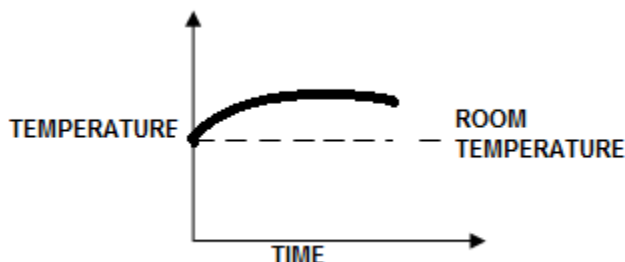
b)



c)



d)



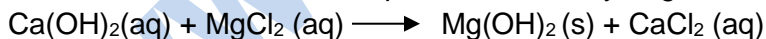
68. Non-stoichiometric compounds are formed by:

- Only alkali metals
- Only transition elements
- Only noble gases
- None of above

69. Which statement is correct about noble gases?

- Their oxidation state is zero
- They react easily with alkali metals
- They exist in form of molecules
- They are also known as halogens

70. Magnesium oxide is used in the making of the lining of blast furnaces. It is extracted from sea water as follows. Aqueous calcium hydroxide is added to sea water.



The magnesium hydroxide is then filtered off and roasted. Which of the following comparisons between calcium and magnesium explains why magnesium hydroxide forms?

- Magnesium is less electropositive than calcium
- Magnesium is lower than calcium in the reactivity series
- The enthalpy change of hydration for  $\text{Mg}^{2+}$  is less exothermic than for  $\text{Ca}^{2+}$
- The solubility product for  $\text{Mg(OH)}_2$  is lower than that for  $\text{Ca(OH)}_2$
- The magnitude of the lattice energy of  $\text{Mg(OH)}_2$  is less than that of  $\text{Ca(OH)}_2$

**BIOLOGY:**

71. Which process is essential in making nitrogen in dead plant material available to growing plants?

- Ammonification



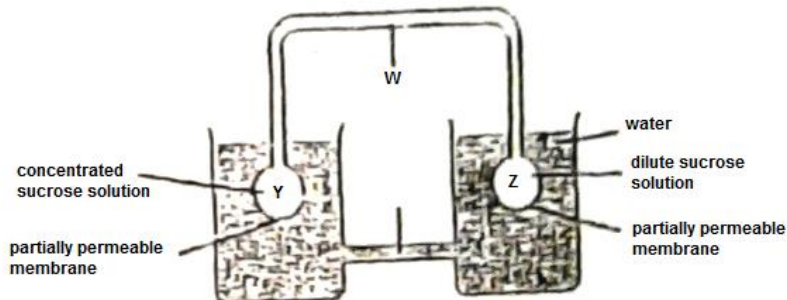


	<b>P</b>	<b>Q</b>	<b>R</b>	<b>S</b>
<b>A</b>	Denitrification by anaerobic bacteria	Nitrogen fixation by nitrifying bacteria	Decay of leaf tissue by saprotrophic fungi	Ammonification by saprotrophic fungi
<b>B</b>	Lightening action of nitrates	Nitrogen fixation by nitrogen fixing bacteria	Decomposition using nitrogenase enzyme	Decomposition by nodule bacteria
<b>C</b>	Nitrification by anaerobic bacteria	Nitrification using nitrogenase enzyme	Decay of leaf tissue by saprotrophic fungi	Assimilation of organic nitrogen
<b>D</b>	Reduction of nitrate by anaerobic bacteria	Nitrogen fixation by root nodule bacteria	Decomposition of organic nitrogen	Decay of urea by saprotrophic bacteria

75. In the commercial manufacture of insulin, a human gene is inserted into which of these?

- a) A chromosome of human cell
- b) A protein molecule in a yeast cell
- c) The DNA of a bacterium
- d) The nucleic acid in a virus

76. The diagram shows a model to demonstrate the mass flow hypothesis of translocation.



In a plant, what are the structures W, X, Y and Z what is the direction of flow of solution along W?

	<b>Phloem</b>	<b>Xylem</b>	<b>roots</b>	<b>Leaves</b>
<b>A</b>	W	X	Y	Z
<b>B</b>	W	X	Z	Y
<b>C</b>	X	W	Y	Z
<b>D</b>	X	W	Z	Y

77. Many scientists believe that one of the following is/are evolutionary origin(s) of animals, plants and fungi?

- a) Protists

- b) Algae
  - c) Bacteria
  - d) Protozoan's
78. In the human body, blood circulating from the gut to the heart passes through the:
- a) Aorta
  - b) Kidneys
  - c) Lungs
  - d) Spleen
79. The diagram shows the four types of human tooth.

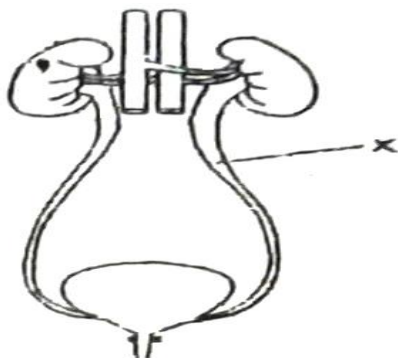


Which teeth are used for cutting rather than grinding food?

- a) 1 and 2
  - b) 2 and 3
  - c) 3 and 4
  - d) 4 and 1
80. What are the functions of the inter, motor and sensory neurons in a reflex response?

	<b>Inter Neuron</b>	<b>Motor Neuron</b>	<b>Sensory Neuron</b>
A	To connect neurons within the central nervous system	To conduct impulses to the central nervous system	To conduct impulses from the receptor to the central nervous system
B	To conduct impulses to the effector	To connect neuron within the central nervous system	To receive the stimulus
C	To conduct impulses from the central nervous system to the effector	To conduct impulses from the receptor to the central nervous system	To connect neurons within the central nervous system
D	To conduct impulses from the receptor to the central nervous system	To conduct impulses from the receptor to the central nervous system	To conduct impulses from the effector

81. The diagram shows the human urinary system.



Which substances is not found in the liquid at in x in a health person?

- a) Glucose
  - b) Salt
  - c) Water
82. Male and female sea urchins release their sperm and eggs into the water fertilization take place. How can their reproduction be described?
- a) A sexual reproduction which results in genetically dissimilar offspring
  - b) A sexual reproduction which results in genetically identical offspring
  - c) Sexual reproduction which results in genetically dissimilar offspring
  - d) Sexual reproduction which results in genetically identical offspring
83. Which vertebrate group have scaly skin?
- a) Amphibians and fish
  - b) Amphibian and mammals
  - c) Fish and mammals
  - d) Fish and reptiles
84. The following reaction occurs in the human alimentary canal.
- $$\text{starch} \xrightarrow{\text{enzyme}} \text{products}$$

What is the enzyme and the product?

85. Archaeopteryx is a transitional stage between the members of which one of the following pairs?
- a) Amphibian → bird
  - b) Fish → amphibian
  - c) Reptile → mammal
  - d) Reptile → bird
  - e) Mammal → man
86. In the Krebs cycle, substrate-level phosphorylation accompanies the formation of:
- a) Citrate
  - b) Alpha-ketoglutarate
  - c) Succinate
  - d) Fumarate
  - e) Oxaloacetate

87. When a physician elicits the knee-Jerk reflex by trapping deep tendons in the knee, the normal response is for the lower leg to swing forward. When this happens:
- Muscles in the front of the thigh are contracting and muscles in the back of the thigh are relaxing
  - Muscles in the front of the lower leg are contracting and muscles in the back of the lower leg are relaxing
  - Muscles in the back of the lower leg are contracting and muscles in the front of the thigh are relaxing
  - Muscles in the back of the lower leg are contracting and muscles in the front of the lower leg are relaxing
  - None of the above
88. One of the following which is the incorrectly paired one?
- Robert hooke..... cell wall
  - Schleiden and Schwann ..... cell theory
  - Robert brown .... Nucleus
  - Watson and crick ..... DNA model
  - Virchow .... Mosaic model of plasma membrane
89. Identify the phylum in which the larva is bilaterally symmetrical but the adult is radially symmetrical:
- Ctenophore
  - Coelenterate

E	Enzyme	Product
<sup>c</sup> A	Acid	Glucose
<sup>h</sup> B	Alkali	energy
<sup>l</sup> C	Amylase	maltose
<sup>n</sup> D	Bile	Amino acid

- Dermata
  - Sipunculuidea
90. The botanical name of gum tree is :
- Acacia mlotica
  - Mimosa pudica
  - Acacia catechu
  - Prosopis glandulosa
  - Albizzia lebbek
91. A pure breeding plant with the dominant phenotype of character P and the recessive phenotype of character Q was crossed with another pure-breeding plant with the recessive phenotype of character P and the dominant phenotype of Q. the offspring of this cross were crossed with a double homozygous recessive for P and Q the following results obtained:
- 22 were phenotypically dominant for both P and recessive for Q  
5 were phenotypically dominant for both P and Q

4 were phenotypically dominant for both P and Q  
 24 were phenotypically recessive for P and dominant for Q  
 Which one of the following types of inheritance is illustrated by these results?

- a) Gene linkage of P and Q
- b) Independent dihybrid inheritance
- c) Multiple alleles
- d) Polygenic inheritance

92. How many metacarpals are present in the hand?

- a) 4
- b) 3
- c) 6
- d) 5
- e) 8

93. The events shown below occur during different phases of mitosis:

- I. Spiralization of DNA
- II. Hydration of DNA
- III. Centromeres split
- IV. Centromeres attach to spindle fibres
- V. DNA replicates

Which one of the following correctly identifies each of the phases described?

	Inter phase	Pro phase	Meta phase	Ana phase	Telo phase
A	I	II	III	IV	V
B	I	V	IV	II	III
C	V	I	IV	III	II
D	II	IV	I	III	V
E	V	IV	I	II	III

94. Which of the following is not a difference that would allow one to distinguish between a prokaryotic and a eukaryotic cell?

- I. Presence or absence of the nucleus
  - II. Presence or absence of the cell wall
  - III. Membrane-bound versus no membrane-bound organelles
- a) I only
  - b) II only
  - c) III only
  - d) I and II only
  - e) I, II and III

95. Some enzymes require the presence of a non-protein molecule to behave catalytically.

An enzyme devoid of this molecule is called a (n)

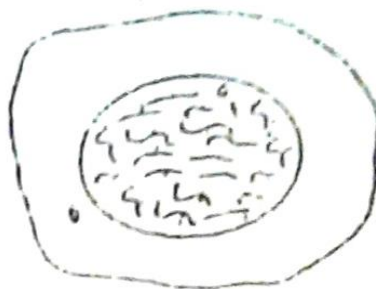
- a) Holo enzyme
- b) Apo enzyme
- c) Coenzyme
- d) Zymo enzyme

96. The floral formula of family mimosaceae is:

- A)  $\oplus, \overset{\curvearrowright}{\ominus}, K_{(5)}, \overline{C_{(5)}}, A_5, \underline{G_{(2)}}$
- B)  $+, \overset{\curvearrowright}{\ominus}, K_{(5)}, C_{1+2+(2)}, A_{(9)+1}, \underline{G}$
- C)  $+, \overset{\curvearrowright}{\ominus}, K_{(5) \text{ or } 5}, C_5, A_{10}, \underline{G}_1$
- D)  $\oplus, \overset{\curvearrowright}{\ominus}, K_{(5)}, C_{5 \text{ or } (5)}, A_{\alpha \text{ or } (10)}$

- e) None of above

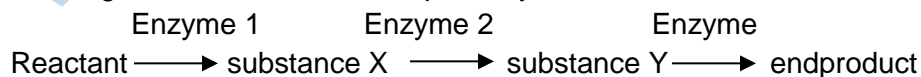
97. The diagram shows a cell of an organism formed by reduction division.



What is the diploid number for the organism?

- a) 10
  - b) 20
  - c) 30
  - d) 40
  - e) 44
98. When a fetus is in the uterus, what carries oxygen away from the Placenta?
- a) The amniotic fluid
  - b) The amniotic sac
  - c) The lining of the uterus
  - d) The umbilical cord

99. The diagram shows a metabolic pathway.



What would be the effect of adding small amount of a non-competitive inhibitor of enzyme 2?

- a) Enzyme 2 would be partially denatured
- b) Substances X would increase in concentration
- c) Substance would no longer be formed

- d) The initial reactant would no longer be metabolized
  - e) The effect would be negligible
100. Which type of protein structure contains the three dimensional structure?
- a) Primary
  - b) Secondary
  - c) Tertiary
  - d) Quaternary