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Time: 3 Hour Total Marks: 720

NEET

Subjects : Physics, Chemistry, Botany, Zoology

Section :1
Subject : Physics

1. The relative density of a metal may be found by hanging a block of the metal from a spring balance and noting that in air the balance reads (5.00 $\pm$0.05) N while in water it reads (4.00 $\pm$0.05) N. The relative density would be quoted as

   (a) (500 $\pm$0.10)
   (b) 5.00 $\pm$6%
   (c) (5.00 $\pm$0.05)
   (d) 5.00 $\pm$11%

2. In a thermal power station :

   (a) chemical energy of burning coal is converted into electrical energy
   (b) gravitational energy is converted into electrical energy
   (c) potential energy is converted into electrical energy
   (d) geothermal energy is converted into electrical energy

3. A body at rest is acted upon by a constant force. What is the nature of v-t graph ?

   (a) Straight line
   (b) Symmetric parabola
   (c) Asymmetric parabola
   (d) Rectangular hyperbola

4. The following question consist of two statements - Statement 1 and Statement 2. Select one of the following options :
   Statement 1 : In two dimensional motion of a body air friction has a significant role.
   Statement 2 : Since the air action or reaction are opposite to motion of the body only so net speed can be taking in the valid direction for two dimensional motion.

   (a) If both Statement 1 and Statement 2 are true and Statement 2 is a correct explanation of the Statement 1.
   (b) If both Statement 1 and Statement 2 are true but the Statement 2 is not a correct explanation of Statement 1.
   (c) If Statement 1 is true but Statement 2 is false.
   (d) Both Statement 1 and Statement 2 are false.

5. Two bodies with masses m_1 and m_2 $(m_1 > m_2)$ are joined by a string passing over a fixed pulley. The centres of gravity of the two masses are initially at the same height. Assume masses of the pulley and weight of the thread negligible. The acceleration of the centre of mass of m_1 and m_2 is :

   (a) $\frac{m_1 - m_2}{m_1 + m_2}$
   (b) $\frac{m_1 g}{m_1 + m_2}$
   (c) $\frac{m_2 g}{m_1 + m_2}$
   (d) $\left(\frac{m_1 - m_2}{m_1 + m_2}\right)^2 g$

All The Best!!!

6. A small sphere is suspended by a string from the ceiling of a car. If the car begins to move with a constant acceleration a, the tension generated in the string is :

(a) $T = T_0$ **(b)** $T > T_0$

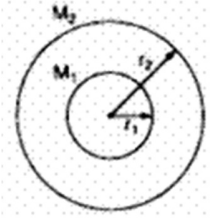
(c) $T < T_0$ **(d)** T = 0 where T_0 is the tension in the string when the car is at rest or moving with uniform velocity.

7. Work done in moving a body up an inclined rough plane (μ) of length s will be :

(a) $mg(\sin\theta - \mu\cos\theta)\ s$ **(b)** $mg(\mu\sin\theta - \cos\theta)\ s$

(c) $mg(\mu\sin\theta + \cos\theta)\ s$ **(d)** $mg(\sin\theta + \cos\theta)\ s$

8. Two concentric shells of masses M_1 and M_2 are having radii r_1 and r_2. Which of the following is the correct expression for the gravitational field on a mass m ?



(a) $F = \frac{G(M_1 + M_2)}{r^2}$, for $r < r_1$ **(b)** $F = \frac{G(M_1 + M_2)}{r^2}$, for $r < r_2$

(c) $F = \frac{GM_2}{r^2}$, for $r_1 < r < r_2$ **(d)** $F = \frac{GM_1}{r^2}$, for $r_1 < r < r_2$

9. The following question consist of two statements - Statement 1 and Statement 2. Select one of the following options :

Statement 1 : A planet revolving around sun gathering mass some how gets an increase in its speed.

Statement 2 : More mass means more weight.

(a) If the Statement 1 and Statement 2 both are true and Statement 2 is correct explanation of the Statement 1.

(b) If the Statement 1 and Statement 2 both are true but Statement 2 is not the correct explanation of Statement 1.

(c) If the Statement 1 is true but Statement 2 is false.

(d) If the Statement 1 and Statement 2 both are false.

10. If R is the radius of earth, the height at which the weight of a body becomes $\frac{1}{4}$ of its weight on the surface of earth is :

(a) 2R **(b)** R

(c) $\frac{R}{2}$ **(d)** $\frac{R}{4}$

11. If a section of soap bubble (of radius R) through its centre is considered, the force on one half due to surface tension is :

(a) $2\pi RT$ **(b)** $4\pi RT$

(c) $\pi R^2 T$ **(d)** $2T/R$

12. Thermometers which are not kept in touch with the body to measure temperatures are :

(a) pyrometers **(b)** thermocouples

(c) gas thermometers **(d)** vapour pressure thermometers

13. 5 gm of steam at 100° C is passed into six gm of ice at 0° C. If the latent heats of steam and ice in cal per gm are 540 and 80 respectively, the mixture contains :

(a) 11 gm of water **(b)** 8 gm of water

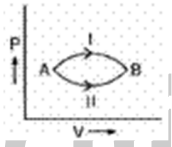
(c) 6 gm of water **(d)** 5 gm of water

14. A rod of length l with thermally insulated lateral surface is made of a material whose thermal conductivity K varies as K = C/T, where C is a constant. The ends are at temperatures T_1 and T_2 . The heat flow density is :

(a) $C \log \frac{T_2}{T_1}$ **(b)** $\frac{C}{l} \log \left(\frac{T_2}{T_1} \right)$

(c) $\frac{C}{l} \log (T_1 T_2)$ **(d)** $C l \log \left(\frac{T_2}{T_1} \right)$

15. A gas at state A changes to state B through path I and II shown in figure. The change in internal energy is ΔU_1 and ΔU_2 respectively. Then :



(a) $\Delta U_1 > \Delta U_2$ **(b)** $\Delta U_1 < \Delta U_2$

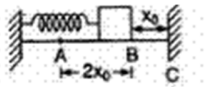
(c) $\Delta U_1 = \Delta U_2$ **(d)** $\Delta U_1 = \Delta U_2 = 0$

16. Blowing air with open mouth is an example of :

(a) isobaric process **(b)** isochoric process

(c) adiabatic process **(d)** isothermal process

17. One end of a spring of force constant k is fixed to a vertical wall and the other to a body of mass m resting on a smooth horizontal surface. There is another wall at a distance x_0 from the body. The spring is then compressed by $2x_0$ and released. The time taken to strike the wall is :



(a) $\frac{\pi}{6} \sqrt{\frac{k}{m}}$ **(b)** $\sqrt{\frac{k}{m}}$

(c) $\frac{2\pi}{3} \sqrt{\frac{m}{k}}$ **(d)** $\frac{\pi}{4} \sqrt{\frac{k}{m}}$

18. If sound waves can be assumed to be diffracted which of the following objects will diffract sound waves in air from a 384 Hz tunning fork?

(a) A sphere of radius 10m **(b)** A sphere of radius 1 m

(c) A sphere of radius 1 mm

(d) A sphere of radius 1 cm

19. When two waves of almost equal frequencies n_1 and n_2 are produced simultaneously, then the time interval between successive maxima is :

(a) $\frac{1}{n_1 - n_2}$

(b) $\frac{1}{n_1} - \frac{1}{n_2}$

(c) $\frac{1}{n_1} + \frac{1}{n_2}$

(d) $\frac{1}{n_1 + n_2}$

20. The following question consist of two statements - Statement 1 and Statement 2. Select one of the following options :

Statement 1 : Popular form of Newton Laplace formula is $v = \sqrt{\frac{\lambda P}{\rho}}$ where v is velocity of sound, γ is ratio of molar specific heats at constant pressure and volume. P is pressure and ρ is density of medium.

Statement 2 : Laplace corrected Newton's formula. According to Laplace sound travels in a gas as per isothermal conditions.

(a) If Statement 1 and Statement 2 both are true and Statement 2 is correct explanation of Statement 1.

(b) If Statement 1 and Statement 2 both are true but Statement 2 is not the correct explanation of Statement 1.

(c) If Statement 1 and Statement 2 both are false.

(d) If Statement 1 is true but Statement 2 is false.

21. A man M_1 of mass 80 kg runs up a staircase in 15 s. Another man M_2 also of mass 80 kg runs up the same staircase in 20 s. The ratio of the power developed by them will be :

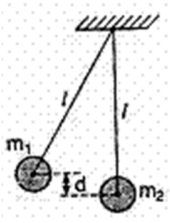
(a) 1

(b) 4/3

(c) 16/9

(d) none of these

22. Two pendulum each of length l are initially situated as shown in figure. The first pendulum is released and strikes the second. Assume that the collision is completely inelastic and neglect the mass of string and any frictional effects. How high does the centre of mass rise after the collision ?



(a) $d\left[\frac{m_1}{(m_1+m_2)}\right]^2$

(b) $d\left[\frac{m_1}{(m_1+m_2)}\right]$

(c) $\frac{d(m_1+m_2)^2}{m_2}$

(d) $d\left[\frac{m_2}{(m_1+m_2)}\right]^2$

23. A charge Q is uniformly distributed over a large square plate of copper. The electric field at a point very close to the centre of the plate is 10 V/m. If the copper plate is replaced by a plastic

plate of the same geometrical dimensions and carrying the same charge Q uniformly distributed, then the electric field at the point P will be

(a) 5 V/m

(b) zero

(c) 10 V/m

(d) 20 V/m

24. The following question consist of two statements - Statement 1 and Statement 2. Select one of the following options :
Statement 1 : The electric current is because of drift velocity of electrons.
Statement 2 : The drift velocity is very small as compared to the thermal velocity.

(a) If both Statement 1 and Statement 2 are true and the Statement 2 is the correct explanation of the Statement 1.

(b) If both Statement 1 and Statement 2 are true but Statement 2 is not the correct explanation of the Statement 1.

(c) If Statement 1 is true but Statement 2 is false.

(d) If Statement 1 is false but Statement 2 is true.

25. If coil is open, then L and R become :

(a) $\infty, 0$

(b) $0, \infty$

(c) ∞, ∞

(d) 0, 0

26. A coil of resistance R and inductance L is connected to a battery of E volt e.m.f. The final current in the coil is :

(a) E/R

(b) E/L

(c) $\sqrt{E/(R^2+L^2)}$

(d) $\sqrt{EL/(R^2+L^2)}$

27. What is the basic reason for the shining of a diamond?

(a) Reflection

(b) Refraction

(c) Dispersion of light

(d) Total internal reflection

28. The potential barrier at a p-n junction is due to the charges on either side of the junction. These charges are :

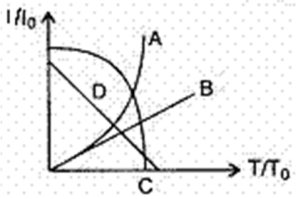
(a) fixed donor and acceptor ions

(b) minority carries

(c) majority carries

(d) both majority and minority carries

29. The ratio of thermionic currents (I/I_0) for a metal when the temperature is slowly increased from T_0 to T as shown in the figure (I and I_0 are currents at T and T_0 respectively). Then which one is correct?



(a) A

(b) B

(c) C

(d) D

30. For the equation $F \propto A^a v^b d^c$, where F is the force, A is the area, v is the velocity and d is the density, the values of a, b and c are respectively

(a) 1, 2, 1 **(b)** 2, 1, 1

(c) 1, 1, 2 **(d)** 0, 1, 1

31. A stone of mass 1 kg is tied to the end of a string 1m long. It is whirled in a vertical circle. The velocity of the stone at the bottom of the circle is just sufficient to take it to the top of circle without slackening of the string. What is the tension in the string at the top of the circle? (Take $g = 10\ ms^{-2}$)

(a) zero **(b)** 1 N

(c) $\sqrt{10}N$ **(d)** 10 N

32. A motorcycle is going on an overbridge of radius R. The driver maintains a constant speed. As the motorcycle is ascending on the overbridge, the normal force on it

(a) Increases **(b)** Decreases

(c) Remains the same **(d)** Fluctuates

33. Four metallic plates of equal surface area A are arranged, as shown. The equivalent capacitance between A ann B is,

(a) $\frac{\varepsilon_o A}{d}$ **(b)** $\frac{3\varepsilon_o A}{d}$

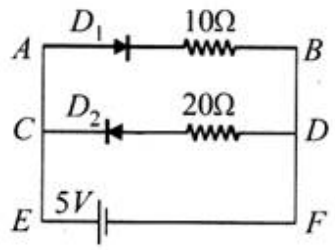
(c) $\frac{3\varepsilon_o A}{2d}$ **(d)** $\frac{2}{3}\frac{\varepsilon_o A}{d}$

34. Two light waves superimposing at the mid-point of the screen are coming from coherent sources of light with phase difference 3π rad. Their amplitudes are 1 cm each. The resultant amplitude at the given point will be,

(a) 5 cm **(b)** 3 cm

(c) 2 cm **(d)** zero

35. Two ideal diodes are connected to a battery as shown in the circuit. The current supplied by the battery is



(a) 0.75 A **(b)** zero

(c) 0.25 A **(d)** 0.5 A

36. In a transistor

(a) the emitter has the least concentration of impurity

(b) the collector has the least concentration of impurity

(c) the base has the least concentration of impunity

(d) all the three regions have equal concentration of impurity

37. The current gain of a transistor in common base mode is 0.995. The current gain of the same transistor in common emitter mode is

(a) 197

(b) 201

(c) 198

(d) 199

38. The mother and daughter elements with the emission of alpha particles are called :

(a) isotopes

(b) isobars

(c) isomers

(d) isodiaphers

39. A proton accelerated through a potential V has de-Broglie wavelength l . Then the de-Broglie wavelength of an a -particle, when accelerated through the same potential V is

(a) $\frac{\lambda}{2}$

(b) $\frac{\lambda}{\sqrt{2}}$

(c) $\frac{\lambda}{2\sqrt{2}}$

(d) $\frac{\lambda}{8}$

40. In a moving coil galvanometer, we use a radial magnetic field so that the galvanometer scale is :

(a) logarithmic

(b) exponential

(c) linear

(d) none of these

41. A conducting rod of mass m and length l is placed over a smooth horizontal surface. A uniform magnetic field B is acting perpendicular to the rod. Charge q is suddenly passed through the rod and it acquires an initial velocity v on the surface, then q is equal to

(a) $\frac{2mv}{Bl}$

(b) $\frac{Bl}{2mv}$

(c) $\frac{mv}{Bl}$

(d) $\frac{Blv}{2m}$

42. A nucleus of ${}_{84}PO^{210}$ originally at rest emits α -particle with speed υ . What will be the recoil speed of the daughter nucleus?

(a) $4\upsilon/206$

(b) $4\upsilon/214$

(c) $\upsilon/206$

(d) $\upsilon/214$

43. Thermal neutrons are those which :

(a) are at very high temperature

(b) move with high velocities

(c) have kinetic energies similar to those of surrounding molecules

(d) are at rest

44. The mass defect per nucleon is called

(a) binding energy

(b) packing fraction

(c) ionization energy

(d) excitation energy

45. The rest mass energy of deuteron $^{2}_{1}H$, is 1876 MeV, the rest of mass of a proton is equivalent to 939 MeV and that of a neutron is 940 MeV. A deuteron may disintegrate to a proton and a neutron if it

(a) emits a g-ray photon of energy 2 MeV

(b) captures a g-ray photon of energy 2 MeV

(c) emits a g-rays photon of energy 3 MeV

(d) captures a g -ray photon of energy 3 MeV

Section :2
Subject : Chemistry

1. Law of multiple proportion was given by

(a) Landolt

(b) Dalton

(c) Richter

(d) Proust

2. The mass of 112 cm^3 of O_2 gas at STP is

(a) 0.16 g

(b) 0.8 g

(c) 0.08 g

(d) 1.6 g

3. The equivalent mass of Fe in FeO is _____

(a) 56

(b) 28

(c) 36

(d) 18.66

4. The amount of the zinc needed to produce 112 mL of H_2 at STP on reaction with dil H_2SO_4 will be

(a) 0.65 g

(b) 0.325 g

(c) 6.5 g

(d) 3.25 g

5. An atom present at the corner is shared by how many cubes

(a) 2

(b) 6

(c) 8

(d) 12

6. At relatively high pressure, the van der Waal's equation of state reduces to

(a) $PV=RT-a/V$

(b) $PV=aRT/V^2$

(c) $PV=RT-a/V^2$

(d) $PV=RT+Pb$

7. Which of the following does not have a face-centred cubic lattice ?

(a) Fe **(b)** Ni

(c) Cu **(d)** Na

8. The element used by Rutherford in his famous scattering experiment was

(a) tin **(b)** gold

(c) lead **(d)** silver

9. The uncertainly in the position of an electron if the uncertainly in its velocity is 0.1% would be $(v_e = 2.2 \times 10^6\ m\,s^{-1})$

(a) 20 nm **(b)** 22 nm

(c) 26 nm **(d)** 28 nm

10. Among Al_2O_3 , SiO_2 , P_2O_3 and SO_2 the correct order of acid strength is

(a) $Al_2O_3 < SiO_2 < SO_2 < P_2O_3$ **(b)** $SiO_2 < SO_2 < Al_2O_3 < P_2O_3$

(c) $SO_2 < P_2O_3 < SiO_2 < Al_2O_3$ **(d)** $Al_2O_3 < SiO_2 < P_2O_3 < SO_2$

11. Lithium is the strongest reducing agent among the alkali metals due to which of the following factor

(a) ionization enthalpy **(b)** electron affinity

(c) hydration enthalpy **(d)** lattice enthalpy

12. The shape of $O_2F_2$is similar to that of

(a) C_2F_2 **(b)** H_2O_2

(c) H_2F_2 **(d)** C_2H_2

13. Nitrogen dioxide cannot be prepared by heating :

(a) KNO_3 **(b)** $Pb(NO_3)_2$

(c) $Cu(NO_3)_2$ **(d)** $AgNO_3$

14. The following question contains two statements. Choose one of the options below:
Statement 1: SiF_6^{2-} ions known but $SiCl_6^{2-}$ is not.
Statement 2 : F has small size and lone pair of electrons on fluorine interact with d-orbitals of Si strongly.

(a) Statement-1 is True, Statement -2 is true, Statement - 2 is a correct explanation for Statement -1

(b) Statement -1 is True, Statement -2 is true, Statement-2 is not a correct explanation for Statement-1

(c) Statement-1 is True, Statement-2 is False

(d) Statement-1 is False, Statement-2 is True

15. Propene when heated with chlorine at about 500°C forms

(a) $CH_2Cl - CH = CH_2$ **(b)** $CH_3 - CHCl - CH_2Cl$

(c) $CH_2Cl - CHCl - CH_2Cl$ **(d)** All of these

16. The following question contains two statements. Choose one of the options below:
Statement 1 : But-l-ene reacts with HBr in the presence of benzoyl peroxide to give 1-bromobutane.
Statement 2 : In the presence of peroxide, free radical mechanism is followed.

(a) Statement-1 is True, Statement -2 is true, Statement - 2 is a correct explanation for Statement -1

(b) Statement -1 is True, Statement -2 is true, Statement-2 is not a correct explanation for Statement-1

(c) Statement-1 is True, Statement-2 is False

(d) Statement-1 is False, Statement-2 is True

17. An aqueous solution freezers at $-0.186^{o}C$. What is its elevation in boiling point if K_f = 1.86 and K_b = 0.512 ?

(a) 0.186

(b) 0.512

(c) 0.80

(d) 0.0512

18. The units of second order reaction rate constant is

(a) L^{-1} mol sec^{-1}

(b) L^{2} mol $^{-2}$ sec^{-1}

(c) L mol^{-1} sec^{-1}

(d) sec^{-1}

19. Which of the following is least effective in causing flocculation of ferric hydroxide solution?

(a) $K_4[Fe(CN)_6]$

(b) Na_2CrO_4

(c) KBr

(d) Na_2SO_4

20. Which of the following pairs of ions have the same electronic configuration ?

(a) Ni^{2+}, Co^{3+}

(b) Fe^{3+}, Mn^{2+}

(c) Fe^{2+}, Mn^{2+}

(d) Sc^{3+}, Ti^{3+}

21. In the complex $[ML_x]^{n+}$, the central metal ion has five unpaired electrons and L is a weak ligand. What will be the number of unpaired electrons in this complex ion ?

(a) 0

(b) 1

(c) 5

(d) Cannot be predicted

22. The enzymes which are used to convert starch into ethyl alcohol are :

(a) maltase, diastase

(b) diastase, maltase, zymase

(c) invertase, zymase

(d) invertase, diastase, maltase

23. The most symmetric crystal system is

(a) Cubic

(b) Tetrahedral

(c) Triclinic

(d) Orthorhombic

24. The arrangement of Cl^- ions in CsCl structure is

(a) hcp

(b) Simple cubic

(c) fcc

(d) bcc

25. CsBr crystal has bcc structure. It has an edge length of 4.3Å . The shortest interionic distance between Cs^+ and Br^- ions is __

(a) 3.72Å **(b)** 3.72Å

(c) 4.3Å **(d)** 7.44Å

26. Picric acid is obtained from

(a) phenol + dil. HNO_3 **(b)** phenol + conc. HNO_2

(c) phenol + conc. H_2SO_4 **(d)** phenol + conc. HNO_3

27. Boiling point of ethanol is higher than that of diethyl ether because

(a) molecular mass of ether is higher **(b)** molecular mass of ether is lower

(c) existence of hydrogen bonding in ethanol **(d)** ether is lighter than alcohol

28. The reagent with which both aldehyde and acetone react easily is

(a) Fehling's reagent **(b)** Grignard reagent

(c) Schiff's reagent **(d)** Tollen's reagent

29. In esterification reaction, conc. H_2SO_4 is necessary to

(a) catalyse the reaction **(b)** accelerate the forward reaction

(c) prevent the backward reaction **(d)** obtain ester in pure form by removing water

30. The N-H bond in NH_3 is:

(a) Covalent **(b)** ionic

(c) dative **(d)** hydrogen

31. The energy order of dipole-dipole forces is

(a) 1 to 2 kJ/mole **(b)** 3 to 4 kJ/mole

(c) 10 to 20 kJ/mole **(d)** 15 to 25 kJ/mole

32. According to 1st law of thermodynamics

(a) The energy of system is constant **(b)** The energy of universe is constant

(c) The energy of surroundings is constant **(d)** The energy of system and surroundings are not constant

33. A reaction, $A + B \rightarrow C + D + q$ is found to have a positive entropy change. The reaction will be

(a) possible at high temperature **(b)** possible only at low temperature

(c) not possible at any temperature **(d)** possible at any temperature

34. Which of the following elements does not show disproportion tendency?

(a) Cl

(b) Br

(c) F

(d) I

35. The formula of the gas liberated when heavy water reacts with calcium carbide is

(a) C_2D_2

(b) C_2H_2

(c) CD_2

(d) CD_4

36. E_1, E_2 and E_3 are the emf values of three galvanic cells respectively

(A) $Zn \mid Zn^{2+}_{1M} \parallel Cu^{+2}_{0.1M} \mid Cu$ (B) $Zn \mid Zn^{2+}_{1M} \parallel Cu^{2+}_{1M} \mid Cu$ (C) $Zn \mid Zn^{2+}_{0.1M} \parallel Cu^{2+}_{1M} \mid Cu$

Which one of the following is true?

(a) $E_2 > E_3 > E_1$

(b) $E_3 > E_2 > E_1$

(c) $E_1 > E_2 > E_3$

(d) $E_1 > E_3 > E_2$

37. Mineral cleveite on heating produces…

(a) Helium

(b) Xenon

(c) Krypton

(d) Argon

38. The number of ions formed by sodium argentocyanide is

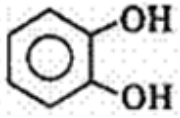
(a) 2

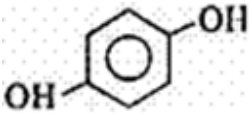
(b) 4

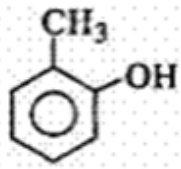
(c) 3

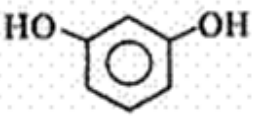
(d) 6

39. Select the structural formula of catechol

(a) 

(b) 

(c) 

(d) 

40. In which of the following, there is no change in the hybridization ?

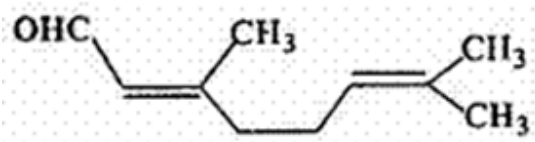
(a) $CH_3CONH_2 \longrightarrow CH_3CN + H_2O$

(b) $CH_3-\overset{\overset{O}{\|}}{C}-H \xrightarrow[H_2O/H^+]{HCN}$ Lactic acid

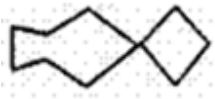
(c) $CH_3-COOH \xrightarrow{\text{Reduction}} CH_3CH_2-OI$

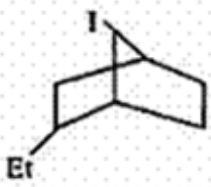
(d) $CH_3-\overset{\overset{O}{\|}}{C}-H \xrightarrow{(O)} CH_3COOH$

41. Which name is correct ?

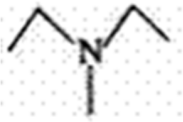
(a) 

3, 7-Dimethyloct -2, 6-dienal

(b)  Spiro (3, 6)decane

(c) 

3-Ethyl-7-iodobicyclo (2.2.1) heptane

(d) 

N-Ethyl-N-methylethanamine

42. Ozone layer of stratosphere requires protection from indiscriminate use of

(a) fungicides, insecticides, bactericides and medicines

(b) Aerosols and high flying jets

(c) Atomic explosions and industrial wastes

(d) Baloons and aeroplanes

43. Aspirin is chemically :

(a) methyl benzoate

(b) ethyl salicylate

(c) acetyl salicylic acid

(d) o-hydroxy benzoic acid

44. Sucrolose structure is similar to

(a) Saccharin

(b) Sucrose

(c) Fructose

(d) Glucose

45. Which of the following is not a semisynthetic polymer?

(a) cis-polyisoprene

(b) Cellulose nitrate

(c) Cellulose acetate

(d) Vulcanized rubber

Section :3
Subject: Botany

1. Livings differ from nonlivings in

(a) having organization of their molecules

(b) having compounds of C.H.O

(c) having macromolecules

(d) all correct

2. Holotype is a :

(a) Typical specimen designated by author for nomenclature and publication

(b) Incomplete specimen

(c) Unpreserved specimen

(d) Specimen from other locality

3. The third name in trinomial nomenclature is

(a) Variety

(b) Subspecies

(c) Mutant **(d)** Cultivar

4. Common features of species within a genus are called :

(a) Correlated characters **(b)** Common characters

(c) Genus characters **(d)** Similar characters

5. First time Binomial nomenclature was written as:

(a) Greek **(b)** Latin

(c) English **(d)** Italian

6. Species are considered as

(a) Real units of classification devised by taxonomists **(b)** Real basic units of classification

(c) The lowest units of classification **(d)** Artificial concept of human mind which cannot be defined in absolute terms

7. The system of plant classification proposed by Carolus Linnaeus was artificial because

(a) It was based on evolutionary relationship of plants **(b)** It was based on similarities and differences in floral and other morphological characters only

(c) It took into account the physiological facts along with the morphological characters **(d)** None of the above

8. Microridges on the surface of Amoeba help in:

(a) Adhesion **(b)** Respiration

(c) Excretion **(d)** Osmoregulation

9. Chemically stigma (eye spot) of Chlamydomonas is:

(a) proteinaceous **(b)** lipoidal

(c) carbohydraceous **(d)** siliceous

10. The photosynthetic product is:

(a) floridean starch in red algae **(b)** laminarin and mannitol in brown stage

(c) starch in green algae **(d)** all of the above

11. Study the given figure and identify the kind of phyllotaxy

(a) Alternate - Opposite superposed - Opposite decussate **(b)** Alternate - Opposite superposed - Whorled

(c) Opposite decussate - Alternate - Whorled **(d)** Opposite superposed - Worled - Alternate

12. Persistent calyx is the character of plants belonging to family

(a) Solanaceae **(b)** Malvaceae

(c) Cruciferae (Brassicaceae) **(d)** Compositae

13. Polyarch vascular bundles generally occur in

(a) Monocot stem **(b)** Dicot stem

(c) Dicot root **(d)** Monocot root

14. A typical monocotyledonous root is characterized by

(a) Usually more than six xylem bundles **(b)** Large and well developed bundles

(c) No secondary growth **(d)** All of these

15. A conjoint and open vascular bundle will be observed in the transverse section of

(a) Monocot root **(b)** Monocot stem

(c) Dicot root **(d)** Dicot stem

16. Which of the following is an example of imbibitions?

(a) Uptake of water by root hair **(b)** Exchange of gases in stomata

(c) Swelling of seed when put in soil **(d)** Opening of stomata

17. Dr F. Went noted that if coleoptile tips were removed and placed on agar for one hour, the agar would produce a bending when placed on one side of freshly- cut coleoptile stumps. Of what significance is this experiment?

(a) It made possible the isolation and exact identification of auxin **(b)** It is the basis for quantitative determination of small amounts of growth- promoting substances

(c) It supports the hypothesis that IAA is auxin **(d)** It demonstrated polar movements of auxins

18. Fruit and leaf drop at early stages can be prevented by the application of:

(a) Cytokinins **(b)** Ethylene

(c) Auxins **(d)** Gibberellic acid

19. In a seed of maize, scutellum is considered as cotyledon because it

(a) Protects the embryo **(b)** Contains food for the embryo

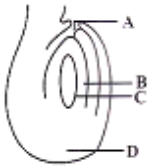
(c) Absorbs food materials and supplies them to the embryo **(d)** Converts itself into a monocot leaf

20. Ovulation in the human female normally takes place during the menstrual cycle

(a) At the beginning of the proliferative phase **(b)** At the end of the proliferative phase

(c) At the mid secretory phase **(d)** Just before the end of the secretory phase

21. Identify the parts labeled A, B, C and D in the given figure and select the correct option.



(a) Chalaza - Female gametophyte - Embryo sac - Micropyle
(b) Chalaza - Nucellus - Embryo sac - Micropyle
(c) Micropyle - Egg - Embryo sac - Chalaza
(d) Micropyle - Nucellus - Embryo sac - Chalaza

22. Double fertilization was first discovered in 1898 by ___ in Fritillaria and Lilium

(a) Nawaschin
(b) Strasburger
(c) Amici
(d) Focke

23. The monocotyledonous seed consists of one large and shield shaped cotyledon known as

(a) Aleurone layer
(b) Scutellum
(c) Coleoptile
(d) Hilum

24. In which one of the following pollination is autogamous?

(a) Geitonogamy
(b) Xenogamy
(c) Chasmogamy
(d) Cleistogamy

25. The F_2 generation offspring in a plant showing incomplete dominance, exhibit

(a) Variable genotypic and phenotypic ratios
(b) A genotypic ratio of 1 : 1
(c) A phenotypic ratio of 3 : 1
(d) Similar phenotypic and genotypic ratios of 1 : 2 : 1

26. Genes which code for a pair of contrasting traits are known as

(a) Dominant genes
(b) Alleles
(c) Linked genes
(d) None of these

27. What is the probability of production of dwarf offsprings in a cross between two heterozygous tall pea plants?

(a) Zero
(b) 50%
(c) 25%
(d) 100%

28. Phenotypic and genotypic ratio is similar in case of

(a) Complete dominance
(b) Incomplete dominance
(c) Over dominance
(d) Epistasis

29. Both sickle cell anaemia and Huntington's chorea are

(a) Congenital disorders
(b) Pollutant induced disorders
(c) Virus related diseases
(d) Bacteria related diseases

30. DNA nucleotides are attached by

(a) Hydrogen bond
(b) Covalent bond
(c) Van der waals bond
(d) Electrovalent Bond

31. Sunn hemp (Indian hemp) is derived from

(a) Malvaceae
(b) Leguminosae
(c) Compositae
(d) Solanaceae

32. Husk fibre Coir of commerce come from which part of coconut (Cocos nucifera)

(a) Epicarp
(b) Mesocarp
(c) Endocarp
(d) Seed coat

33. Birds specially chicken grown for meat only is known as

(a) Hybrid
(b) Broiler
(c) Bird mangement
(d) Bird culture

34. In honey, the main constituent is

(a) Calcium
(b) Sugar
(c) Protein
(d) Water

35. Which one of the following pairs is mismatched ?

(a) Apis indica - honey
(b) Kenia lacca - lac
(c) Pila globosa - pearl
(d) None of these

36. Confusion technique uses

(a) Juvenile hormone
(b) Ecdysone
(c) Pheromone
(d) A combination of hormones

37. Consider the following statements (A-D) about organic farming(A) Utilizes genetically modified crops like Bt cotton(B) Uses only naturally produced inputs like compost(C) Does not use pesticides and urea(D) Produces vegetables rich in vitamins and minerals
Which of the above statements are correct

(a) (B) and (C) only
(b) (A) and (B) only
(c) (B), (C)and (D)
(d) (C) and (D)only

38. Which of the following bacteria is present in the rumen of cattle?

(a) Azotobacter
(b) Rhizobium
(c) Methanobacterium
(d) Azospirillum

39. Which one of the following pairs is correctly matched?

(a) Rhizobium - Parasite in the roots of leguminous plants
(b) Mycorrhizae - Mineral uptake from soil
(c) Yeast - Production of biogas
(d) Azospirillum - Symbiotic fixing bacterium

40. Two microbes found to be very useful in genetic engineering are

(a) Vibrio cholera and a tailed baceriophage

(b) Diplococcus sp. And Pseudomonas sp.

(c) Crown gall bacterium and Caenorhabditis elegans

(d) Escherichia coli and Agrobacterium tumefaciens

41. Geometric representation of age structure is a characteristic of

(a) population

(b) landscape

(c) ecosystem

(d) Biotic community

42. Tiger is not a resident in which one of the following national park?

(a) Sunderbans

(b) Gir

(c) Jim Corbett

(d) Ranthambhor

43. Which one of these is not included in the biodiversity hot spots of India?

(a) Western ghats

(b) Himalayas

(c) Indo Burma

(d) North Indian Plains

44. Which of the following statements is correct?

(a) Steller's sea cow is an extinct animal

(b) Lantana is popularly known as carrot grass

(c) Parthenium is an endemic species of our country

(d) African catfish is not a threat to indigenous catfishes

45. All cells of a multicellular body have same karyotype because the body has developed from a zygote by -

(a) meiotic and mitotic divisions

(b) only mitotic divisions

(c) only meiotic divisions

(d) mitotic and amitotic divisions

Section :4
Subject: Zoology

1. Which is anticoagulated in blood cell counting?

(a) CH_3COOH

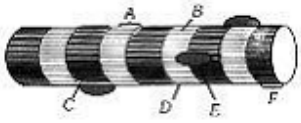
(b) $H-CHO$

(c) EDTA

(d) C_6H_6

(e) HCl

2. The diagram given below represents the histology of a stripped muscle. Label the parts A, B, C, D, E and F



(a) A - Sarcoplasm, B - Nucleus, C - Sarcolemma, D - Myofibril, E - Dark band, F - Light band

(b) A - Sarcoplasm, B - Light band, C - Myofibril, D - Sarcolemma, E - Nucleus, F - Dark band

(c) A - Light band, B - Sarcoplasm, C - Myofibril, D - Sarcolemma, E - Nucleus, F - Dark band

(d) A - Sarcolemma, B - Nucleus, C - Dark band, D - Light band, E - Sarcoplasm, F - Myofibril

3. A your infant may be feeding entirely on mother's milk which is white in colour but the stools which the infant passes out is quite yellowish. What is this yellow colour due to

(a) Intestinal juice

(b) Bile pigments passed through bile

(c) Undigested milk protein casein

(d) Pancreatic juice poured into duodenum

4. Which of the following teeth are lophodont

(a) Incisor and canine

(b) Premolar and molar

(c) Canine and premolar

(d) Premolar and incisor

5. Vitamin D is synthesised by one of the following with the help of sunlight

(a) Skin

(b) Gall bladder

(c) Liver

(d) Pancreas

6. In man cellulose is digested in

(a) The caecum

(b) The colon

(c) The appendix

(d) Not digested at all

7. The intestine is different from the stomach by the presence of

(a) Digestive gland

(b) Villi

(c) Sub-mucosa

(d) Serosa

8. Wisdom teeth in human is

(a) 3rd molar & 4 in number

(b) 3rd molar & 2 in number

(c) 2nd molar & 4 in number

(d) 2nd molar & 2 in number

9. Which of the following carries glucose from digestive tract to liver

(a) Hepatic artery

(b) Pulmonary vein

(c) Hepatic portal vein

(d) Renal portal system

10. Which of the following statements is incorrect?

(a) Brunner's glands are submucosal

(b) Irregular folds of gastric mucosa are rugae

(c) Glisson's capsule is the connective tissue sheath of hepatic lobule

(d) Mesothelium or serosa lies in close proximity to the circular layer of muscularis

11. The rate of heart beat per minute is highest in case of

(a) Elephant

(b) Whale

(c) Man

(d) Mouse

12. In haemoglobin iron is present in

(a) Ferrous form **(b)** Ferric form

(c) Metallic form **(d)** Any form

13. Contraction of a muscle is caused by

(a) Myosin **(b)** Actin

(c) ATP **(d)** Actomysoin

14. Bone is distinguished from the cartilage by the presence of

(a) Collagen **(b)** Blood vessels

(c) Lymph vessels **(d)** Haversian canals

15. The thick filament in muscles is polymerized protein of

(a) Meromyosins **(b)** Actins

(c) Troponins **(d)** Tropomyosins

16. Intercellular communication in multicellular organism occurs through

(a) Digestive system only **(b)** Respiratory system only

(c) Nervous system only **(d)** Both nervous and endocrine system

17. A small passage that permits continuity between scala vestibule and scala tympani is

(a) Heicotrema **(b)** Eustachian tube

(c) Cochlea **(d)** Vestibule

18. Steroid hormones regualte gene activity through

(a) Transcription **(b)** Binding with specific DNA sites

(c) Removing the repressor molecules **(d)** The formation of a receptor complex

19. Which of the following hormones is necessary for the development of secondary sexual characters, in mammals including human beings?

(a) Estrogen **(b)** FSH

(c) Testosterone **(d)** Both (a) and (c)

20. The 24 hour (diurnal) rhythm of our body such as the sleep wake cycle is regulated by the hormone

(a) Adrenaline **(b)** Melatonin

(c) Calcitonin **(d)** Prolactin

21. Which one of the following biomolecules is correctly Characterized ?

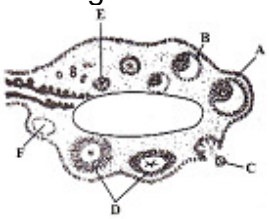
(a) Adenylic acid . adenosine with a glucose phosphate molecule

(b) Alanine amino acid . Contains an amino group and an acidic group anywhere in the molecule

(c) Lecithin . a phosphorylated glyceride found in cell membrane

(d) Palmitic acid . an unsaturated fatty acid with 18 carbon atoms

22. In the given T.S of human ovary identify A to F and select the correct option



(a) A-secretion follicle, B-Tertiary follicle with antrum, C-Ovum, D-Corpus luteum, E-Primary follicle, F-Corpus albicans

(b) A-Graafian follicle, B-Tertiary follicle with antrum, C-ovum, D-corpus spongiosum, E-primary follicle F-Corpus albicans

(c) A-Graafian follicle, B-Tertiary follicle with antrum, C-ovum, D-corpus albicans, E-primary follicle F-Corpus luteum

(d) A-Graafian follicle, B-Tertiary follicle with antrum, C-ovum, D-corpus luteum, E-primary follicle F-Corpus albicans

23. Layers of an ovum from outside to inside is

(a) Corona radiata, zona pellucida and vitelline membrane

(b) Zona pellucida, corona radiata and vitelline membrane

(c) vitelline membrane, zona pellucida and corona radiata

(d) Zona pellucida, vitelline membrane, and corona radiata

24. 1 st polar body is formed at which stage of oogenesis?

(a) 1 st meosis

(b) 2 nd meosis

(c) 1 st mitosis

(d) Differentiation

25. Industrial melanism is an example of

(a) Defensive adaptation of skin against ultraviolet radiations

(b) Drug resistance

(c) Darkening of skin due to smoke from industries

(d) Protective resemblance with the surrounding

26. Which one of the following options gives one correct example each of convergent evolution and divergent evolution?

(a) Eyes of octopus and mammals - Bones of forelimbs of vertebrates

(b) Thorns of Bougainviliea and tendrils of Cucurbita - Wings of butterflies and birds

(c) Bones of forelimbs of vertebrates - Wings of butterfly and birds

(d) Thorns of Bougainvillea and tendrils of Cucurbita - Eyes of octopus and mammals

27. Which of the following is most important for speciation?

(a) Seasonal isolation

(b) Reproductive isolation

(c) Behavioural isolation

(d) Tropical isolation

28. One of the oldest, best preserved and most complete hominid fossil commonly known as 'Lucy' belongs to the genus

(a) Australopithecus

(b) Oreopithecus

(c) Dryopithecus

(d) Pithecanthropus

29. The most accepted theory of origin of life is

(a) theory of spontaneous generation
(b) theory of special creation
(c) Oparin-Haldane theory
(d) theory of eternity of life

30. Allergy involves
(a) IgE
(b) IgG
(c) IgA
(d) IgM

31. Passive immunity can be conferred directly by
(a) Vaccines
(b) Antitoxins
(c) Colostrum
(d) Both (b) and (c)

32. Injection of antitoxin in tetanus confers which type of immunization?
(a) Active immunization
(b) Passive immunization
(c) Auto immunization
(d) Humoral immunization

33. Vaccine against polio viruses is an example of
(a) Auto immunization
(b) Passive immunization
(c) Active immunization
(d) Simple immunization

34. Assertion : Most of experiments regarding sex determination were done on Drosophila.Reason : It is a fruit fly.
(a) If both the assertion and the reason are true and the reason is a correct explanation of the assertion
(b) If both the assertion and reason are true but the reason is not a correct explanation of the assertion
(c) If the assertion is true but the reason is false
(d) If both the assertion and reason are false
(e) If the assertion is false but reason is true

35. Which of the following is required for micro injection method of gene transfer?
(a) Micro particles
(b) Micro pipettes
(c) Divalent cations
(d) UV radiations

36. Which of the following statements are correct with respect to a bioreactor?
(i) It can process large volumes of culture
(ii) It provides optimum temperature and pH
(iii) It is completely an automated tool
(iv) It is a compact thermal cycler
(a) (i) and (ii)
(b) (i), (ii) and (iii)
(c) (iii) and (iv)
(d) (ii) and (iii)

37. An enzyme catalyzing the removal of nucleotides from the ends of DNA is
(a) Endonuclease
(b) Exonulease
(c) DNA ligase
(d) Hind II

38. The DNA fragments separated on an agarose gel can be visualized after staining with:

(a) Acetocarmine
(b) Aniline blue
(c) Ethidium bromide
(d) Bromophenol blue

39. Electrocardiograph was developed by

(a) Hans Berger
(b) Willem Kolff
(c) Willem Einthoven
(d) Wilhelm Roentgen

40. Yeast is used in the production of

(a) Citric acid and lactic acid
(b) Lipase and pectinase
(c) Bread and beer
(d) Cheese and butter

41. Bt toxin protein crystals present in bacterium Bacillus thuringiensis do not kill the bacteria themselves because

(a) Bacteria are resistant to the toxin
(b) Toxins occur as inactive protoxins in bacteria
(c) Bacteria enclose toxins in a special sac
(d) None of these

42. Early detection of a disease is possible by

(a) PCR
(b) Gene therapy
(c) Recombinant DNA technology and ELISA
(d) Both (a) and (c)

43. During the processing of proinsulin into the mature insulin

(a) C-peptide is added to proinsulin
(b) C-peptide is removed from proinsulin
(c) B-peptide is added to proinsulin
(d) B-peptide is removed from proinsulin

44. The genetically-modified (GM) brinjal in India has been developed for:

(a) insect-resistance
(b) enhancing shelf life
(c) enhancing mineral content
(d) drought-resistance

45. Just as Culex is to elephantiasis (filariasis) so is:

(a) Entamoeba to dysentery
(b) Rat flea to bubonic plague
(c) Sandfly to sleeping sickness
(d) Pork to tapeworm