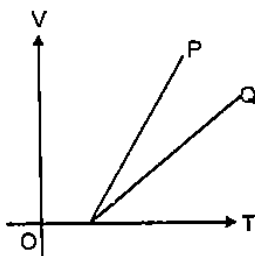


PHYSICS

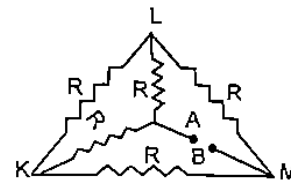
1. The resistance R of a wire is given by the relation $R = \frac{\rho l}{\pi r^2}$. Percentage error in the measurement of ρ , l and r is 1%, 2% and 3% respectively. Then the percentage error in the measurement of R is
- A. 6 B. 9
C. 8 D. 10

2. Figure shows the v - t graph of two particles P and Q . Which of the following statements regarding their relative motion is true? Their relative velocity


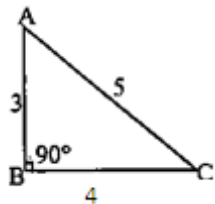


- A. is zero
B. is non – zero but constant
C. continuously decreases
D. continuously increases
3. time required to boil 2 litres of water initially at 20°C by a heater coil which works at 80% efficiency spending 500 joule/s is
- A. 82 minutes B. 50 minutes
C. 28 minutes D. 37 minutes
4. A mass is tied to a string and rotated in a vertical circle, the minimum velocity of the body at the top is
- A. \sqrt{gr} B. g/r
C. $\left(\frac{g}{r}\right)^{3/2}$ D. gr
5. A man projects a coin upwards from the gate of a uniformly moving train. The path of coin for the man will be
- A. parabolic
B. inclined straight line
C. vertical straight line
D. horizontal straight line
6. What is the disintegration constant of radon, if the number of its atoms diminishes by 18% in 24 h?
- A. $2.1 \times 10^{-3} \text{ s}^{-1}$
B. $2.1 \times 10^{-4} \text{ s}^{-1}$
C. $2.1 \times 10^{-5} \text{ s}^{-1}$
D. $2.1 \times 10^{-6} \text{ s}^{-1}$

7. The frequencies of X-rays, γ -rays and ultraviolet rays are respectively a , b , and c . Then
- A. $a < b$, $b < c$ B. $a < b$, $b > c$
C. $a > b$, $b > c$ D. $a > b$, $b < c$
8. A galvanometer can be changed into an ammeter by using
- A. low resistance shunt in series
B. low resistance shunt in parallel
C. high resistance shunt in series
D. high resistance shunt in parallel
9. Which of the following statements is False for a particle moving in a circle with a constant angular speed?
- A. The acceleration vector points to the centre of the circle
B. The acceleration vector is tangent to the circle
C. The velocity vector is tangent to the circle
D. the velocity and acceleration vectors are perpendicular to each other
10. A monoatomic gas at 27°C is compressed adiabatically to $8/27$ of its original volume. The rise in temperature will be
- A. 300°C B. 350°C
C. 375°C D. 400°C
11. Each of the resistance in the network shown is equal to R . The resistance between the terminals A and B is



- A. R B. $5R$
C. $3R$ D. $6R$
12. The energy of hydrogen atom in the n^{th} orbit is E_n then the energy in the n^{th} orbit of single ionised helium atom is
- A. $\frac{E_n}{2}$ B. $2E_n$
C. $4E_n$ D. $\frac{E_n}{4}$
13. Two identical particles move towards each other with velocity $2V$ and v respectively. The velocity of centre of mass is
- A. v B. $v/3$
C. $v/2$ D. zero

14. The mass numbers of He is 4 and that for sulphur is 32. The radius of sulphur nuclei is larger than that of helium by
 A. $\sqrt{8}$ B. 4
 C. 2 D. 8
15. According to Newton's law of cooling, the rate of cooling of a body is proportional to $(\Delta\theta)^n$, where $\Delta\theta$ is the difference of the temperature of the body and the surroundings, then n is equal to
 A. two B. three
 C. four D. one
16. A body having initially velocity of 10 m/s moving on a rough surface comes to rest after moving 50 m. What is coefficient of friction between the body and surface? ($g = 10 \text{ m/s}^2$)
 A. 0.5 B. 0.2
 C. 0.3 D. 0.1
17. The separation between successive fringes in a double slit arrangement is x. If the whole arrangement is dipped under water what will be the new fringe separation? [The wavelength of light being used is 5000 \AA]
 ($\mu_w = 4/3$)
 A. 1.5 x B. x
 C. 0.75 x D. 2x
18. A thin, metallic spherical shell contains a charge Q on it. A point charge q is placed at the centre of shell and another charge q_1 is placed outside it as shown in figure. All the three charges are positive. The force on the charge at the centre is

 A. towards left B. towards right
 C. upwards D. zero
19. A charge q is moving with a velocity v parallel to a magnetic field B. force on the charge due to magnetic field is
 A. q v B B. q B/v
 C. zero D. B v/q
20. A bucket full of hot water is kept in a room and it cools from 75°C to 70°C in T_1 minutes, from 70°C to 65°C in T_2 minutes and from 65°C to 60°C in T_3 minutes. Then
 A. $T_1 = T_2 = T_3$
 B. $T_1 < T_2 < T_3$
 C. $T_1 > T_2 > T_3$
 D. $T_1 < T_2 > T_3$
21. In uniform circular motion, the velocity vector and acceleration vector are
 A. perpendicular to each other
 B. in same direction
 C. in opposite direction
 D. not related to each other
22. The current in a coil of $L = 40 \text{ mH}$ is to be increased uniformly from 1A to 11 A in 4 milli sec.
 The induced e.m.f. will be
 A. 100 V B. 0.4 V
 C. 440 V D. 40 V
23. Two capacitors when connected in series have a capacitance of $3 \mu\text{F}$ and when connected in parallel have a capacitance of $16 \mu\text{F}$. Their individual capacitors are
 A. $1 \mu\text{F}, 2 \mu\text{F}$
 B. $6 \mu\text{F}, 2 \mu\text{F}$
 C. $12 \mu\text{F}, 4 \mu\text{F}$
 D. $3 \mu\text{F}, 16 \mu\text{F}$
24. The weight of a body will be the least at
 A. poles
 B. equator
 C. at height equal to R
 D. centre of the earth
25. When a tuning fork produces sound waves in air, which one of the following is same in the material of tuning fork as well as in air?
 A. Wavelength B. Frequency
 C. Velocity D. Amplitude
26. The Fermi energy for a substance is?
 A. independent of T
 B. directly proportional to \sqrt{T}
 C. directly proportional to T
 D. directly proportional to T^2
27. ABC is a triangular plate of uniform thickness. The sides are in the ratio shown in the figure. I_{AB} , I_{BC} , and I_{CA} are the moments of inertia of the plate about AB, BC and CA as axes respectively. Which one of the following relations is correct?

 A. $I_{AB} > I_{BC}$ B. $I_{BC} > I_{AB}$
 C. $I_{AB} + I_{BC} = I_{CA}$ D. I_{CA} is maximum

28. Consider the following statement:
When jumping from some height, you should bend your knees as you come to rest, instead of keeping your legs stiff. Which of the following relations can be useful in explaining the statement? Where symbols have their usual meanings.

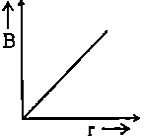
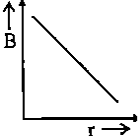
A. $\Delta \vec{p}_1 = \Delta \vec{p}_2$
B. $\Delta E = \Delta(PE + KE) = 0$
C. $\vec{F}\Delta t = m\Delta \vec{v}$
D. $\Delta x \propto \Delta F$

29. The amplitude of magnetic field of an electromagnetic wave is 2×10^{-7} T. Its electric field amplitude if the wave is travelling in free space is

A. 6 Vm^{-1} B. 60 Vm^{-1}
C. $10/6 \text{ Vm}^{-1}$ D. None of these

30. The magnetic flux density B at a distance r from a long straight wire carrying a steady current varies with distance r as

A.  B. 

C.  D. 

31. A metal piece is heated upto T^0 K. The temperature of the surrounding is t^0 K. The heat loss in the surrounding due to radiation is proportional to

A. $(T - T)^4$ B. $T^4 - t^4$
C. $(T - t)^{1/4}$ D. $T^2 - t^2$

32. Given ${}_a\mu_g = \frac{3}{2}$, ${}_a\mu_w = \frac{4}{3}$ if a convex lens of focal length 10 cm is placed in water, then its focal length in water is

A. equal to 40 cm
B. equal to 20 cm
C. equal to 10 cm
D. None of these

33. If an alternating current is flowing in a spring, then the springs shape will be changing

A. in a straight line
B. periodically
C. elliptically
D. first C then A

34. The unit vector along $2i - 3j + k$ is

A. $\frac{2i-3j+k}{\sqrt{14}}$ B. $\frac{2i-3j+k}{5}$
C. $\frac{2i-3j+k}{\sqrt{15}}$ D. None of these

35. An iron rod of length 2m and cross – sectional area of 50 mm^2 is stretched by 0.5 mm, when a mass of 250 kg is hung from its lower end. Young's modulus of iron rod is

A. $19.6 \times 10^{20} \text{ N/m}^2$
B. $19.6 \times 10^{18} \text{ N/m}^2$
C. $19.6 \times 10^{10} \text{ N/m}^2$
D. $19.6 \times 10^{15} \text{ N/m}^2$

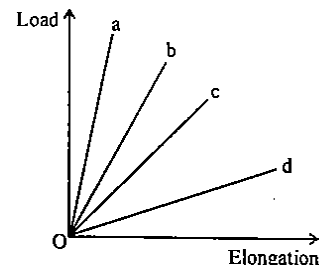
36. A particle of mass 1 kg moving is S.H.M. with an amplitude 0.02 and a frequency of 60 Hz. The maximum force acting on the particle is

A. $144 \pi^2$ B. $188 \pi^2$
C. $288 \pi^2$ D. None of these

37. According to Maxwell's hypothesis, a changing electric field gives rise to

A. an e.m.f
B. magnetic field
C. electric current
D. pressure gradient

38. The load versus elongation graph for four wires has been shown in the figure. The thinnest wire is



A. a B. b C. c D. d

39. A ray of light is incident on the surface of separation of a medium with the velocity of light at an angle 45^0 and is refracted in the medium at an angle 30^0 . Velocity of light in the medium will

Be (velocity of light in air = $3 \times 10^8 \text{ m/s}$)
A. $3.8 \times 10^8 \text{ m/s}$ B. $3.38 \times 10^8 \text{ m/s}$
C. $2.12 \times 10^8 \text{ m/s}$ D. $1.56 \times 10^8 \text{ m/s}$

40. The rain drops are in spherical shape due to

A. residual pressure
B. thrust on drop
C. surface tension
D. viscosity

41. A dip circle is so set that its needle moves freely in the magnetic meridian. In this position,

the angle of dip is 40° . Now the dip circle is rotated so that the plane in which the needle moves makes an angle of 30° with the magnetic meridian. In this position, the needle will dip by an angle

- A. 40° B. 30°
C. more than 40° D. less than 40°

42. If the critical angle for total internal reflection from a medium to vacuum is 30° . Then velocity of light in the medium is
A. 1.5×10^8 m/s
B. 2×10^8 m/s
C. 3×10^8 m/s
D. 0.75×10^8 m/s
43. An oscillator is nothing but an amplifier with
A. positive feedback
B. large gain
C. no feedback
D. negative feedback
44. For an AM – system the total power of modulated signal is 600 W and that of carrier is 400 W, the modulation index is
A. 0.25 B. 0.36
C. 0.54 D. 1
45. The drift current in a p-n junction is
A. from the n – side to the p – side
B. from the p – side to the n – side
C. from the n – side to the p-side if the junction is forward – biased and in the opposite direction if it is reverse – biased
D. from the p – side to the n – side if the junction is forward – biased and in the opposite direction if it is reverse – biased

CHEMISTRY

46. An acidic solution of 'X' does not give precipitate on passing H_2S through it. 'X' gives white precipitate when NH_4OH is added to it. The white precipitate dissolves in excess of NaOH solution. Pure 'X' fumes in air and dense white fumes are obtained when a glass rod dipped in NH_4OH is put in the fumes. Compound 'X' can be
A. $ZnCl_2$ B. $FeCl_3$
C. $AlCl_3$ D. $SnCl_2$
47. CN^- is a strong field ligand. This is due to the fact that
A. it carries negative charge
B. it is a pseudohalide
C. it can accept electrons from metal species
D. it forms high spin complexes with metal species
48. The weight of NaCl decomposed by 4.9 g of H_2SO_4 , if 6 g of sodium hydrogen sulphate and 1.825 g of HCl, were produced in the reaction is:
A. 6.921 g B. 4.65 g
C. 2.925 g D. 1.4 g
49. Which one of the following statement is not true?
A. pH of drinking water should be between 5.5 – 9.5
B. Concentration of DO below 6 ppm is good for the growth of fish
C. Clean water would have a BOD value of less than 5 ppm
D. Oxides of sulphur, nitrogen and carbon are the most widespread air pollutant
50. Which of the following statements is not correct for nitrogen?
A. Its electronegativity is very high
B. d-orbital are available for bonding
C. It is a typical non – metal
D. Its molecular size is small
51. Heat of dissociation of CH_3COOH is $0.005 \text{ kcal g}^{-1}$, hence enthalpy change when 1 mol of $Ca(OH)_2$ is completely neutralised by CH_3COOH is
A. – 27.4 kcal B. – 13.6 kcal
C. – 26.8 kcal D. – 27.1 kcal
52. 0.4 moles of HCl and 0.2 moles of $CaCl_2$ were dissolved in water to have 500 mL of solution, the molarity of Cl^- ion is:
A. 0.8 M B. 1.6 M
C. 1.2 M D. 10.0 M
53. In sodium fusion test of organic compounds, the nitrogen of the organic compound is converted into
A. Sodamide
B. Sodium cyanide
C. Sodium nitrite
D. Sodium nitrate
54. Specific volume of cylindrical virus particle is $6.02 \times 10^{-2} \text{ cc/gm}$. Whose radius and length 7 \AA & 10 \AA respectively. If $N_A = 6.02 \times 10^{23}$, find molecular weight of virus
A. $3.08 \times 10^3 \text{ kg/mol}$
B. $3.08 \times 10^4 \text{ kg/mol}$
C. $1.54 \times 10^4 \text{ kg/mol}$
D. 15.4 kg/mol
55. Inductive effect involves

- A. displacement of σ - electrons
B. delocalisation of π - electron
C. delocalisation of σ -electrons
D. displacement of π - electron

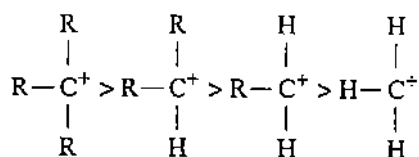
56. The energy of a photon is 3×10^{-12} erg. What is wavelength in nm?

$$(h = 6.62 \times 10^{-27} \text{ erg - sec; } c = 3 \times 10^{10} \text{ cm/s})$$

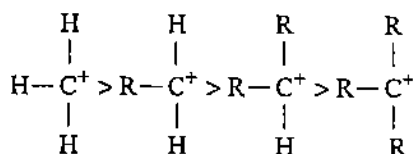
- A. 662 B. 1324
C. 66.2 D. 6.62

57. The decreasing order of stability of alkyl carbonium ion is in order of:

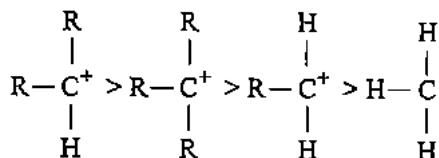
A.



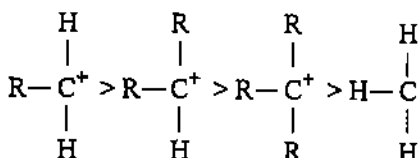
B.



C.



D.



58. Aluminium vessels should not be washed with materials containing washing soda since

- A. washing soda is expensive
B. washing soda is easily decomposed
C. washing soda reacts with Al to form soluble aluminate
D. washing soda reacts with Al to form insoluble aluminium oxide

59. The following data are for the decomposition of ammonium nitrite in aqueous solution:

Vol. of N ₂ in cc	Time (min)
6.25	10
9.00	15
11.40	20
13.65	25
35.65	infinity

The order of reaction is:

- A. zero B. one
C. two D. three

60. Which of the following reagents convert propene to 1 – propanol?

- A. H₂O, H₂SO₄
B. aqueous KOH
C. MgSO₄, NaBH₄/H₂O
D. B₂H₆, H₂O₂, OH⁻

61. A closed container contains equal number of oxygen and hydrogen molecules at a total pressure of 740 mm. If oxygen is removed from the system then pressure will

- A. Become double of 740 mm
B. Become half of 740 mm
C. Become 1/9 of 740 mm
D. Remains unchanged

62. Compound X of molecular formula C₄H₆ takes up one equivalent of hydrogen in presence of Pt to form another compound Y which on ozonolysis gives only ethanoic acid. The compound X can be

- A. CH₂ = CH – CH = CH₂
B. CH₂ = C = CHCH₃
C. CH₃C ≡ CCH₃
D. All the three

63. 1 M solution of CH₃COOH should be diluted to time so that pH is doubled.

- A. Four times B. 5.55 x 10⁴ times
C. 5.55 x 10⁶ times D. 10⁻² times

64. The following reactions take place in the blast furnace in the preparation of impure iron. Identify the reaction pertaining to the formation of the slag.

- A. Fe₂O₃(s) + 3 CO(g) → 2Fe(l) + 3 CO₂(g)
B. CaCO₃(s) → CaO (s) + CO₂(g)
C. CaO(s) + SiO₂(s) → CaSiO₃(s)
D. 2C(s) + O₂ (g) → 2 CO(g)

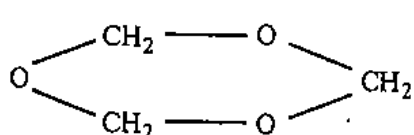
65. Which one of the following is NOT a buffer solution?

- A. 0.8 M H₂S + 0.8 M KHS
B. 2 MC₆H₅NH₂ + 2 MC₆H₅⁺NH₃Br⁻
C. 3 MH₂CO₃ + 3 MKHCO₃
D. 0.05 M KClO₄ + 0.05 M HClO₄

66. Which of the following statements is false?

- A. Radon is obtained from the decay of radium
B. Helium is inert gas
C. Xenon is the most reactive among the rare gases
D. the most abundant rare gas found in the atmosphere is helium

67. Which one of the following is expected to exhibit optical isomerism?
(en = ethylenediamine?)
A. cis – [Pt (NH₃)₂Cl₂]
B. trans – [Pt (NH₃)₂ Cl₂]
C. Cis = [Co(en)₂Cl₂]
D. Trans – [Co(en)₂Cl₂]
68. For the reaction
 $2\text{N}_2\text{O}_5 \rightarrow 4\text{NO}_2 + \text{O}_2$
The rate of reaction is:
A. $\frac{1}{2} \frac{d}{dt} [\text{N}_2\text{O}_5]$
B. $2 \frac{d}{dt} [\text{N}_2\text{O}_5]$
C. $\frac{1}{4} \frac{d}{dt} [\text{NO}_2]$
D. $4 \frac{d}{dt} [\text{NO}_2]$
69. Four successive members of the first row transition elements are listed below with their atomic numbers. Which one of them is expected to have the highest third ionization enthalpy?
A. Vanadium (Z = 23)
B. Chromium (Z = 24)
C. Manganese (Z = 25)
D. Iron (Z = 26)
70. [Cr(H₂O)₆]Cl₃ (at no. Of Cr = 24) has magnetic moment of 3.83 B.M. the correct distribution of 3d electrons in the Chromium of the complex is
A. $3d_{xy}^1, (3d_{x^2-y^2})^1, 3d_{yz}^1$
B. $3d_{xy}^1, 3d_{yz}^1, 3d_{xz}^1$
C. $3d_{xy}^1, 3d_{yz}^1, 3d_{dz^2}$
D. $(3d_{x^2-y^2})^1, 3d_z^2, 3d_{xz}^1$
71. In the balanced chemical reaction
 $\text{IO}_3^- + a\text{I}^- + b\text{H}^+ \rightarrow c\text{H}_2\text{O} + d\text{I}_2$
a,b,c and d respectively corresponds to
A. 5,6,3,3 B. 5,3,6,3
C. 3,5,3,6 D. 5,6,5,5
72. Which of the following statements is true?
A. Silicon exhibits 4 coordination number in its compound
B. Bond energy of F₂ is less than Cl₂
C. Mn (III) in oxidation state is more stable than Mn(II) in aqueous state
D. Elements of 15th group shows only +3 and + 5 oxidation states
73. Which of the following compounds has the highest boiling point?
A. CH₃CH₂CH₂Cl
B. CH₃CH₂CH₂CH₂Cl
C. CH₃CH(CH₃)CH₂Cl
D. (CH₃)₃CCl
74. Which one of the following statements is not correct?
A. Nickel forms Ni(CO)₄
B. All the transition metals from monometallic carbonyls
C. Carbonyls are formed by transition metals
D. Transition metals form complexes
75. Hydrogen has an ionisation energy of 1311 kJ mol⁻¹ and for chlorine it is 1256 kJ mol⁻¹
Hydrogen forms H⁺ (aq) ions but chlorine does not form Cl⁺(aq) ions because
A. H⁺ has lower hydration enthalpy
B. Cl⁺ has lower hydration enthalpy
C. Cl has high electron affinity
D. Cl has high electronegative
76. The number of enantiomers of the compound CH₃CHBrCHBrCOOH is:
A. 2 B. 3
C. 4 D. 6
77. Equivalent weights of KMnO₄ acidic medium neutral medium and concentrated alkaline medium respectively are $\frac{M}{5}, \frac{M}{1}, \frac{M}{3}$. Reduced products can be
A. MnO₂, MnO₄²⁻, Mn²⁺
B. MnO₂, Mn²⁺, MnO₄²⁻
C. Mn²⁺, MnO₄²⁻, MnO₂
D. Mn²⁺, MnO₂, MnO₄²⁻
78. Which of these have no unit?
A. Electronegativity
B. Electron affinity
C. Ionisation energy
D. Excitation potential
79. Which of the following statements is not correct for sigma and Pi-bonds formed between two carbon atoms?
A. Sigma – bond determines the direction between carbon atom but a pi – bond has no primary effect in this regard
B. Sigma – bond is stronger than a Pi- bond
C. Bond energies of sigma – and – pi bonds are of the order of 264 kJ/mol and 347 kJ/mol, respectively
D. Free rotation of atoms about a sigma – bond is allowed but not in case of a pi – bond
80. The reactivity of metals with water is in the order of
A. Na > Mg > Zn > Fe > Cu
B. Cu > Fe > Zn > Mg > Na
C. Mg > Zn > Na > Fe > Cu
D. Zn > Na > Mg > Fe > Cu

81. The emf of Daniell cell at 298 K is E_1
 $Zn | ZnSO_4 (0.01 M) || CuSO_4 (1.0M) | Cu$
When the concentration of $ZnSO_4$ is 1.0 M and that of $CuSO_4$ is 0,01 M, the emf changed to E_2 what is the reaction between E_1 and E_2 ?
A. $E_1 = E_2$ B. $E_2 = 0 \neq E_2$
C. $E_1 > E_2$ D. $E_1 < E_2$
- 82.
- 
- The above show polymer is obtained when a carbonyl compound is allowed to stand, it is a white solid. The polymer is
A. Trioxane
B. Formose
C. Paraformaldehyde
D. Metaldehyde
83. The correct order of atomic/ionic sizes is
A. $N < Li < B$
B. $F^- < O^{2-} < N^{3-}$
C. Ca^{2+}, S^{2-}, Cl^-
D. $Na^+, < Mg^{2+} < Cl^-$
84. The rapid change of pH near the stoichiometric point of an acid – base titration is the basis of indicator detection. pH of the solution is related to ratio of the concentration of the conjugate acid (HIn) and base (In^-) forms of the indicator or by the expression
A. $\log \frac{[In^-]}{[HIn]} = pK_{In} - pH$
B. $\log \frac{[HIn]}{[In^-]} = pK_{In} - pH$
C. $\log \frac{[HIn]}{[In^-]} = pH - pK_{In}$
D. $\log \frac{[In^-]}{[HIn]} = pH - pK_{In}$
85. In the diazotization of arylamines with sodium nitrite and hydrochloric acid, an excess of hydrochloric acid is used primarily to
A. Suppress the concentration of free aniline available for coupling
B. Suppress hydrolysis of phenol
C. Ensure a stoichiometric amount of nitrous acid
D. Neutralise the base liberated
86. In lake test of Al^{3+} ion, there is formation of coloured floating lake. It is due to
A. adsorption of litmus by H_2O
B. adsorption of litmus by $Al(OH)_3$
C. adsorption of litmus by $Al(OH)_4^-$
D. None of these
87. An ideal gas expands in volume from 1×10^{-3} to $1 \times 10^{-2} m^3$ at 300 K against a constant pressure of $1 \times 10^5 Nm^{-2}$. The work done is
A. 270 kJ B. - 900 kJ
C. - 900 kJ D. 900 kJ
88. Ethanol and dimethyl ether form a pair of functional isomers. The boiling point of ethanol is higher than that of dimethyl ether, due to the presence of
A. H-bonding in ethanol
B. H-bonding in dimethyl ether
C. CH_3 group in ethanol
D. CH_3 group in dimethyl ether
89. Which of the following reactions will not result in the formation of anisole?
A. Phenol + dimethyl sulphate in presence of a base
B. Sodium phenoxide is treated with methyl iodide
C. Reaction of diazomethane with phenol
D. Reaction of methylmagnesium iodide with phenol
90. What will be the heat of formation of methane, if the heat of combustion of carbon is '-x' kJ, heat of formation of water is '-y' kJ and heat of combustion of methane is 'z' kJ?
A. $(-x - y + z)kJ$ B. $(-z - x + 2y)kJ$
C. $(-x - 2y - z)kJ$ D. $(-x - 2y + z) KJ$

BIOLOGY

91. True nucleus is absent in
A. Vaucheria B. Volvox
C. Anabaena D. Mucor
92. Which one of the following matches is correct?

A. Mucor	Reproduction by Conjugation.	Ascomycetes
B. Agaricus	Parasitic fungus	Basidiomycetes
C. Phytophthora	Aseptate mycelium	Basidiomycetes
D. Alternaria	Sexual reproduction absent	Deuteromycetes

93. Which one of the following statement is wrong?
A. Chlorella and spirulina are used as space food
B. Mannitol is stored food in Rhodophyceae.
C. Algin and carrageenan are products of algae.
D. Agar-agar is obtained from Gelidium and Gracilaria
94. In which of the following, gametophyte is not independent free living?
A. Pteris B. Pinus
C. Funaria D. Marchantia

95. Read the following five statement (A to E) and select the option with all correct statements.
A. Mosses and lichens are the first organisms to colonise a bare rock.
B. Selaginella is a homosporous pteridophyte.
C. Coralloid roots in Cycas have VAM.
D. Main plant body in bryophytes is gametophytic, whereas in pteridophytes it is sporophytic
E. In gymnosperms, male and female gametophytes are present within sporangia located on sporophyte.
- a. A, D and E b. B, C and E
c. A, C and D d. B, C and D

96. Male gametes are flagellated in
A. Ectocarpus B. Spirogyra
C. Polysiphonia D. Anabaena

97. Which of the following endoparasites of humans does show viviparity?
A. Trichinella spiralis
B. Ascaris lumbricoides
C. Ancylostoma duodenale
D. Enterobius vermicularis

98. Which of the following represents the correct combination without any exception?

A. Sucking and circular mouth; jaws absent, integument without scales; paired appendages.	Cyclostomata
B. Body covered with feathers; skin moist and glandular, fore-limbs form wings; lungs with air sacs.	Aves
C. Mammary gland; hair on body; pinnae; two pairs of limbs. Ammno Telic	Mammalia
D. Mouth ventral; gills with operculum; skin placoid scales; persistent notochord.	Chondrichthyes

99. Which of the following animals is not viviparous?
A. Platypus B. Whale
C. Flying fox (Bat) D. Elephant
100. Which of the following characteristics is mainly responsible for diversification of insects on land?
A. Exoskeleton
B. Eyes
C. Segmentation
D. Bilateral symmetry
- 101.
- $$\oplus \frac{\text{♂}}{\text{♀}} K_{(5)}; C_{(5)} A_5 G_{(2)}$$
- Is the floral formula of?
A. Petunia B. Brassica
C. Allium D. Sesbania
102. Perigynous flowers are found in
A. China rose B. Rose
C. Guava D. cucumber
103. Keel is the characteristic feature of flower of
A. Aloe B. tomato
C. tulip D. Indigofera
104. Leaves become modified into spines in
A. onion B. silk Cotton
C. Opuntia D. pea

105. A major characteristic of monocot root is the presence of
A. vasculature without cambium
B. cambium sandwiched between phloem and xylem along the radius
C. open vascular bundles
D. scattered vascular bundles
106. Vascular bundles in monocotyledons are considered closed because
A. there are no vessels with perforations
B. xylem is surrounded all around by phloem
C. a bundle sheath surrounds each bundle
D. cambium is absent
107. The terga, sterna and pleura of cockroach body are joined by
A. arthrodial membrane
B. cartilage
C. cementing glue
D. muscular tissue
108. DNA is not present in
A. nucleus B. mitochondria
C. chloroplast D. riosomes
109. Nuclear envelope is a derivative of
A. microtubules
B. rough endoplasmic reticulum
C. smooth endoplasmic reticulum
D. membrane of Golgi complex
110. The structures that are formed by stacking of organised flattened membranous sacs in the chloroplasts are
A. stroma lamellae B. stroma
C. cristae D. grana
111. Select the correct matching in the following pairs.
A. Rough ER- Synthesis of glycogen
B. Rough ER- Oxidation of fatty acids
C. Smooth ER- Oxidation of phospholipids
D. Smooth ER- Synthesis of lipids
112. The chromosomes in which centromere is situated close to one end are
A. telocentric B. sub-metacentric
C. metacentric D. acrocentric
113. Which one of the following is not an inclusion body found in prokaryotes?
A. Glycogen granule
B. Polysome

- C. Phosphate granule
D. Cyanophycean granule
114. Which one of following statements is incorrect?
A. The competitive inhibitor does not affect the rate of breakdown of the enzyme-substance complex
B. The presence of the competitive inhibitor decreases the K_m of the enzyme for the substrate
C. A competitive inhibitor reacts reversibly with the enzyme to form an enzyme-inhibitor complex.
D. In competitive inhibition, the inhibitor molecule is not chemically changed by the enzyme
115. A somatic cell that has just completed the S phase of its cell cycle, as compared to gamete of the same species, has
A. twice the number of chromosomes and four times the amount of DNA
B. Four times the number of chromosomes and twice the amount of DNA
C. twice the number of chromosomes and twice the amount of DNA
D. same number of chromosomes bit twice the amount of DNA

116. Select the correct option.;

Column-I	Column-II
A. Synapsis aligns homologous.	I. Anaphase-II
B. Synthesis of RNA and protein.	II. Zygotene
C. Action of enzyme recombinase.	III. G ₂ -phase
D. Centromeres do not separate but chromatids move towards opposite poles.	IV. Anaphase-I

- a. A-I, B-II, C-V, D-IV
b. A-II, B-III, C-IV, D-V
c. A-II, B-I, C-III, D-IV
d. A-II, B-III, C-V, D-IV

117. In a ring girdled plant
A. the shoot and root die together
B. neither root nor shoot will die
C. the shoot dies first
D. the root dies first

118. Which one gives the most valid and recent explanation for stomatal movement?
- Starch hydrolysis
 - Guard cell photosynthesis
 - Transpiration
 - Potassium influx and efflux
119. Transpiration and root pressure cause water to rise in plant by
- pushing it upward
 - pushing and pulling it, respectively
 - pulling it upward
 - pulling and pushing it, respectively
120. Minerals known to be required in large amounts for plant growth include
- potassium, phosphorus, selenium, boron
 - magnesium, sulphur, iron, zinc
 - phosphorus, potassium, sulphur, calcium
 - calcium, magnesium, manganese, copper
121. Cytochromes are found in
- cristae of mitochondria
 - lysosomes
 - matrix of mitochondria
 - outer wall of mitochondria
122. Typical growth curve in plants is
- stairs-steps shaped
 - parabolic
 - sigmoid
 - linear
123. What causes a green plant exposed to the light, on only one side, to bend towards the source of light as it grows?
- Light stimulates plant cells on the lighted side to grow faster.
 - Auxin accumulates on the shaded side, stimulating greater cell elongation there.
 - Green plants need light to perform photosynthesis.
 - Green plants seek light because they are phototropic.
124. Gastric juice of infants contains
- pepsinogen, lipase, rennin
 - amylase, rennin, pepsinogen
 - maltase, pepsinogen, rennin
 - nuclease, pepsinogen, lipase
125. Which of the following statements is not correct?
- Oxyntic cells are present in the mucosa of stomach and secrete HCl.
 - Acini are present in the pancreas and secrete carboxypeptidase.
 - Brunner's glands are present in the submucosa of stomach and secrete pepsinogen
 - Goblet cells are present in the mucosa of intestine and secrete mucus.
126. When you hold your breath, which of the following gas changes in blood would first lead to the urge to breathe?
- Falling CO₂ concentration
 - Rising CO₂ and falling O₂ concentration
 - Falling O₂ concentration
 - Rising CO₂ concentration
127. Erythropoiesis starts in
- spleen
 - red bone marrow
 - kidney
 - liver
128. Which one of the following is correct?
- Lymph = Plasma + RBC + WBC
 - Blood = Plasma + RBC + WBC + Platelets
 - Plasma = Blood - Lymphocytes
 - Serum = Blood + Fibrinogen
129. Blood pressure in the mammalian aorta is maximum during
- systole of the left ventricle
 - diastole of the right atrium
 - systole of the left atrium
 - diastole of the right ventricle
130. Which of the following does not favour the formation of large quantities of dilute urine?
- Renin
 - Atrial-natriuretic factor
 - Alcohol
 - Caffeine
131. Removal of proximal convoluted tubule from the nephron will result in
- no change in quality and quantity of urine
 - no urine formation
 - more diluted urine
 - more concentrated urine
132. Sliding filament theory can be explained as
- actin and myosin filaments do not shorten but rather slide past each other

- B. when myofilaments slide pass each other, myosin filaments shorten while actin filaments do not shorten
C. when myofilaments slide pass each other actin filaments shorten while myosin filaments do not shorten
D. actin and myosin filaments shorten and slide pass each other.
- 133.** Glenoid cavity articulates
A. clavicle with scapula
B. humerus with scapula
C. clavicle with acromion
D. scapula with acromion
- 134.** A gymnast is able to balance his body upside down even in the total darkness because of
A. tectorial membrane
B. organ of corti
C. cochlea
D. vestibular apparatus
- 135.** Which of the following regions of the brain is incorrectly paired with its function?
A. Corpus callosum-communication between the left and right cerebral cortices
B. Cerebrum-calculation and contemplation
C. Medulla oblongata-homeostatic control
D. Cerebellum-language comprehension
- 136.** A chemical signal that has both endocrine and neural roles is
A. epinephrine B. cortisol
C. melatonin D. calcitonin
- 137.** In ginger, vegetative propagation occurs through
A. bulbils B. runners
C. rhizome D. offsets
- 138.** Which of the following are the important floral rewards to the animal pollinators?
A. Floral fragrance and calcium crystals
B. Protein pellicle and stigmatic exudates
C. Colour and large size of flower
D. Nectar and pollen grains
- 139.** Which one of the following may require pollinators, but is genetically similar to autogamy?
A. Apogamy B. Cleistogamy
C. Geitonogamy D. Xenogamy
- 140.** Which one of the following statements is not true?
A. the flowers pollinated by flies and bats secrete foul odour to attract them.
B. Honey is made by bees by digesting pollen collected from flowers
C. Pollen grains are rich in nutrients and they are used in the form of table and syrups.
D. Pollen grains of some plants cause severe allergies and bronchial afflictions in some people
- 141.** The hilum is a scar on the
A. Fruit, where style was present
B. Seed, where microphyle was present
C. seed, where funicle was attached
D. fruit, where it was attached to pedicel.
- 142.** Transmission tissue is characteristic feature of
A. dry stigma
B. wet stigma
C. hollow style
D. solid style
- 143.** Which of the following cells during gametogenesis is normally diploid?
A. Spermatogonia
B. Secondary polar body
C. Primary polar body
D. Spermatid
- 144.** Capacitation refers to changes in the
A. ovum after fertilisation
B. sperm after fertilisation
C. sperm before fertilisation
D. ovum before fertilisation
- 145.** Hysterectomy is surgical removal of
A. vas deferens
B. mammary glands
C. uterus
D. prostate gland
- 146.** Which of these is not important component of initiation of parturition in humans?
A. Release of oxytocin
B. Release of prolactin
C. Increase in estrogen and progesterone ratio
D. Synthesis of prostaglandins
-

147. Which of the following is not a sexually transmitted disease?
A. Trichomoniasis
B. Encephalitis
C. Syphilis
D. Acquired Immuno Deficiency Syndrome (AIDS)
148. Which of the following viruses is not transferred through semen of an infected male?
A. Chikungunya virus
B. Ebola virus
C. Hepatitis B virus
D. Human immunodeficiency virus
149. Alleles are
A. different molecular forms of a gene
B. heterozygotes
C. different phenotype
D. true breeding homozygotes
150. Multiple alleles are present
A. at the same locus of the chromosome
B. on non-sister chromatids
C. on different chromosomes
D. at different loci on the same chromosome
151. A man with blood group 'A' marries a woman with blood group 'B'. What are all the possible blood groups of their offspring?
A. A, B, AB and O
B. O only
C. A and B only
D. A, B and AB only
152. How many pairs of contrasting characters in pea plants were studied by Mendel in his experiments?
A. Eight
B. Seven
C. Five
D. Six
153. An abnormal human baby with 'XXX' sex chromosomes was born due to
A. fusion of two ova and one sperm
B. fusion of two sperms and one ovum
C. formation of abnormal sperms in the father
D. formation of abnormal ova in the mother.
154. Gene regulation governing lactose operon of E.coli involves the lac I gene product is
A. negative and repressible because repressor protein prevents transcription
B. Feedback inhibition because excess of β -galactosidase can switch off transcription
C. Positive and inducible because it can be induced by lactose
D. negative and inducible because repressor protein prevents transcription.
155. The movement of a gene from one linkage group to another is called
A. translocation
B. crossing over
C. inversion
D. duplication
156. In sea urchin DNA, which is double stranded, 17% of the bases were shown to be cytosine. The percentage of the other three bases expected to be present in this DNA are
A. G 17%, A 33%, T 33%
B. G 8.5%, A 50%, T 24.5%
C. G 3.4%, A 24.5%, T 24.5%
D. G 17%, A 16.5%, T 32.5%
157. A population will not exist in Hardy-Weinberg equilibrium if
A. there is no migration
B. the population is large
C. individuals mate selectively
D. there are no mutations
158. Which is the most common mechanism of genetic variation in the population of a sexually reproducing organism?
A. Genetic drift
B. Recombination
C. Transduction
D. Chromosomal aberrations
159. Which of the following had the smallest brain capacity?
A. Homo neanderthalensis
B. Homo habilis
C. Homo erectus
D. Homo sapiens
160. Match each disease with its correct type of vaccine.

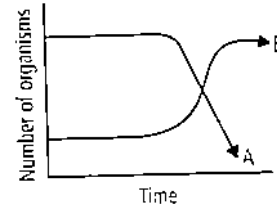
Column-I	Column-II
A. Tuberculosis	I. Harmless virus
B. Whooping cough	II. Inactivated toxin
C. Diphtheria	III. Killed bacteria
D. Polio	IV. Harmless bacteria

- a. A-IV, B-III, C-II, D-I
b. A-I, B-II, C-IV, D-III
c. A-II, B-I, C-III, D-IV
d. A-III, B-II, C-IV, D-I

161. The active form of *Endamoeba histolytic* feeds upon
- food in intestine
 - blood only
 - erythrocytes, mucosa and submucosa of colon
 - mucosa and submucosa of colon only.
162. HIV that causes AIDS, first starts destroying
- helper T-lymphocytes
 - thrombocytes
 - B-lymphocytes
 - leucocytes
163. A technique of micropropagation is
- protoplast fusion
 - embryo rescue
 - somatic hybridisation
 - somatic embryogenesis
164. Which of the following enhances or induces fusion of protoplasts?
- IAA and kinetin
 - IAA and gibberellins
 - Sodium chloride and potassium chloride
 - Polyethylene glycol and sodium nitrate
165. The guts of cow and buffalo possess
- Methanogens
 - Cyanobacteria
 - Fucus* sp.
 - Chlorella* sp.
166. In Bt cotton, the Bt toxin present in plant tissue as protoxin is converted into active toxin due to
- action of gut microorganisms
 - presence of conversion factors in insect gut
 - alkaline pH of the insect gut
 - acidic pH of the insect gut
167. Which body of the Government of India regulates GM research and safety of introducing GM organisms for public services?
- Genetic Engineering Approval Committee
 - Research Committee on Genetic Manipulation
 - Bio-safety committee
 - Indian Council of Agricultural Research
168. The crops engineered for glyphosate are resistant/tolerant to

- insects
- herbicides
- fungi
- bacteria

169. The following graph depicts changes in two populations (A and B) of herbivores in a grassy field. A possible reason for these changes is that



- Population A produced more offspring than population B
 - Population A consumed the members of population B
 - Both plant populations in this habitat decreased
 - Population B competed more successfully for food than population A.
170. The mass of living material at a trophic level at a particular time is called
- net primary productivity
 - standing crop
 - gross primary productivity
 - standing state
171. Vertical distribution of different species occupying different levels in a biotic community is known as
- zonation
 - pyramid
 - divergence
 - stratification
172. Secondary succession takes place on/in
- newly created pond
 - newly cooled lava
 - bare rock
 - degraded forest
173. Most animals are tree dwellers in a
- temperate deciduous forest
 - tropical rainforest
 - coniferous forest
 - thorn woodland
174. In an ecosystem the rate of production of organic matter during photosynthesis is termed as
- secondary productivity
 - net productivity
 - net primary productivity
 - gross primary productivity

175. In which of the following, both pairs have correct combination?
- A. In situ conservation: seed Bank
Ex situ conservation: National Park
 - B. In situ conservation: Tissue culture
Ex situ conservation: Sacred groves
 - C. In situ conservation: National Park
Ex situ conservation: Botanical Garden
 - D. In situ conservation: Cryopreservation
Ex situ conservation: Wildlife Sanctuary
176. Cryopreservation of gemetes of threatened species in viable and fertile condition can be referred to as
- A. in situ conservation by sacred groves
 - B. in situ cryo-conservation of biodiversity
 - C. in situ conservation of biodiversity
 - D. advanced ex situ conservation of biodiversity
177. The UN conference of Parties on climate change in the year 2011 was held in
- A. Peru
 - B. Qatar
 - C. Poland
 - D. South Africa
178. Which of the following is not one of the prime health risks associated with greater UV radiations through the atmosphere due to depletion of stratospheric ozone?
- A. Damage to eyes
 - B. Increased liver cancer
 - C. Increased skin cancer
 - D. Reduced Immune system
179. High value f BOD (Biochemical Oxygen Demand) indicates that
- A. water is less polluted
 - B. consumption of organic matter in the water is higher by the microbes
 - C. water is pure
 - D. water is highly polluted
180. Rachel Carson's famous book "Silent Spring" is related to
- A. population explosion
 - B. ecosystem management
 - C. pesticide pollution
 - D. noise pollution
-