

PHYSICS & CHEMISTRY

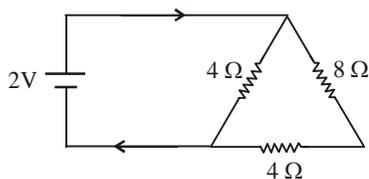
Choose the correct answers :

1. The kinetic energy of an electron which is accelerated through the potential of 100 volts, is
 (1) 1.6×10^{-10} ergs (2) 1.6×10^{-13} ergs
 (3) 1.6×10^{-15} ergs (4) 6.63×10^{-12} ergs
2. If a car at rest accelerates uniformly to a speed of 144 km/h in 20 s, it covers a distance of
 (1) 20 m (2) 800 m
 (3) 400 m (4) 1200 m
3. The position x of a particle varies with time t , as $x = at^2 - bt^3$. The acceleration of the particle will be zero at time t equal to
 (1) $\frac{2a}{3b}$ (2) $\frac{a}{b}$
 (3) $\frac{a}{3b}$ (4) zero
4. In a series resonant circuit, the AC voltage across R , inductance L and capacitance C are 5 V, 10 V, 10 V respectively. The AC voltage applied to the circuit will be
 (1) 25 V (2) 20 V
 (3) 10 V (4) 5 V
5. The torque of a force $F = -3i + j + 5k$, acting at the point $r = 7i + 3j + k$, about the origin, is
 (1) $14i - 38j + 16k$ (2) $4i + 4j + 6k$
 (3) $-21i + 4j + 4k$ (4) $-14i + 38j - 16k$
6. A hollow sphere with a small hole at its bottom is filled with water. It is hung by a long thread and is gently put into oscillation. As the water flows out of the hole at the bottom, the period of oscillation will
 (1) go on decreasing
 (2) go on increasing
 (3) first decrease and then increase to a constant value
 (4) first increase and then decrease to a constant value
7. Which of the following is correct ?
 (1) The current in photocell increases with increasing frequency
 (2) The photocurrent is proportional to the applied voltage
 (3) The photocurrent increases with intensity of light
 (4) The stopping potential increases with increase of intensity of incident light
8. A straight wire of diameter 0.5 mm carrying a current of 1 A is replaced by another wire of 1 mm diameter carrying same current. The strength of the magnetic field far away is
 (1) twice the earlier value
 (2) half of the earlier value
 (3) quarter of the earlier value
 (4) not changed
9. The ball whose kinetic energy is E is thrown at an angle of 45° with the horizontal. Its K.E. at the highest point of its flight will be
 (1) $E/4$ (2) $E/2$
 (3) $E/\sqrt{2}$ (4) 0
10. The escape velocity of body on the surface of the earth is 11.2 km/s. If the earth's mass increases to twice its present value and the radius of the earth becomes half, the escape velocity becomes
 (1) 5.6 km/s (2) 11.2 km/s
 (3) 22.4 km/s (4) 44.8 km/s
11. In carbon monoxide molecules, the carbon and the oxygen atoms are separated by distance 1.2×10^{-10} m. The distance of the centre of mass, from the carbon atoms is
 (1) 0.48×10^{-10} m (2) 0.51×10^{-10} m
 (3) 0.56×10^{-10} m (4) 0.69×10^{-10} m
12. The stable nucleus that has a radius half that of Fe^{56} is
 (1) C^{12} (2) O^{16}
 (3) N^{14} (4) Li^7
13. The following Truth Table belongs to which one of the following four gates ?

A	B	Y
1	1	0
1	0	0
0	1	0
0	0	1

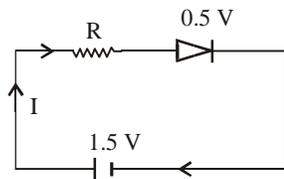
 (1) OR (2) NAND
 (3) XOR (4) NOR
14. The correct relationship between the two current gains α and β in a transistor, is
 (1) $\beta = \frac{\alpha}{1+\alpha}$ (2) $\alpha = \frac{\beta}{1-\beta}$
 (3) $\alpha = \frac{\beta}{1+\beta}$ (4) $\alpha = \frac{1+\beta}{\beta}$

15. Kirchhoff's first law, i.e. $\Sigma i = 0$ at a junction deals with the conservation of
- (1) charge
 - (2) energy
 - (3) momentum
 - (4) angular momentum
16. The current drawn from the cell is



- (1) $\frac{1}{8} A$
 - (2) $\frac{2}{9} A$
 - (3) $\frac{2}{3} A$
 - (4) $1 A$
17. In an a.c. circuit with voltage V and current I , the power dissipated is (A)
- (1) VI
 - (2) $\frac{1}{2} VI$
 - (3) $\frac{1}{\sqrt{2}} VI$
 - (4) depends on the phase between I and V
18. A (100 W, 200 V) bulb is connected to a 160 V supply. The power consumption would be
- (1) 64 W
 - (2) 80 W
 - (3) 100 W
 - (4) 125 W
19. Two bodies of mass m and $4m$ are moving with K.E.s $9 E$ and $4 E$, respectively. The ratio of their linear momenta is
- (1) 2 : 3
 - (2) 3 : 4
 - (3) 4 : 3
 - (4) 9 : 1
20. A metal ball of mass 2 kg, moving with speed of 36 km/h, has a head-on collision with a stationary ball of mass 3 kg. If after collision, the two balls move together, the loss in K.E. due to collision is
- (1) 40 J
 - (2) 60 J
 - (3) 100 J
 - (4) 140 J
21. The period of revolution of planet A around the sun is 8 times of B . The radius of rotation of A about the sun is how many times greater than that of B about the sun?
- (1) 2
 - (2) 3
 - (3) 4
 - (4) 5
22. Due to the earth's magnetic field, charged cosmic ray particles

- (1) require greater kinetic energy to reach the equator than the pole
 - (2) require less kinetic energy to reach the equator than the pole
 - (3) can never reach the pole
 - (4) can never reach the equator
23. Two parallel wires in free space are 10 cm apart, and each carries a current of 10 A in the same direction. the force one wire exerts on the other, per metre of length is
- (1) $2 \times 10^{-4} N$, attractive
 - (2) $2 \times 10^{-7} N$, attractive
 - (3) $2 \times 10^{-4} N$, repulsive
 - (4) $2 \times 10^{+7} N$, attractive
24. The primary winding of a transformer has 500 turns whereas its secondary has 5000 turns. The primary is connected to an a.c. supply of 20 V, 50 Hz. The secondary will have an output of
- (1) 200 V, 50 Hz
 - (2) 200 V, 500 Hz
 - (3) 2 V, 50 Hz
 - (4) 2 V, 5 Hz
25. Standing waves are produced in 10 m long stretched string. If the string vibrates in 5 segments and wave velocity is 20 m/s, the frequency is
- (1) 2 Hz
 - (2) 4 Hz
 - (3) 5 Hz
 - (4) 10 Hz
26. Electromagnetic radiation of frequency n , wavelength λ , travelling with velocity v in air, enters a glass slab of refractive index μ . The frequency, wavelength and velocity of light in the glass slab will be, respectively,
- (1) $\frac{n}{\mu}, \frac{\lambda}{\mu}, \frac{v}{\mu}$
 - (2) $n, \frac{\lambda}{\mu}, \frac{v}{\mu}$
 - (3) $n, \lambda, \frac{v}{\mu}$
 - (4) $\frac{n}{\lambda}, \frac{\lambda}{\mu}, v$
27. A sample of gas expands from volume V_1 to V_2 . The amount of work done by the gas is greatest when the expansion is
- (1) isothermal
 - (2) isobaric
 - (3) adiabatic
 - (4) equal in all the cases
28. The diode used in the circuit shown in the figure has a constant voltage drop at 0.5 V at all currents and a maximum power rating of 100 milliwatts. What should be the value of the resistor R , connected in series and with diode for obtaining maximum current ?



- (1) 5Ω (2) 5.6Ω
 (3) 6.67Ω (4) 20Ω
29. A positively-charged particle moving due east enters a region of uniform magnetic field, directed vertically upwards. This particle will
 (1) get deflected vertically in upward direction
 (2) move in circular path with its increased speed
 (3) move in circular path with its unchanged speed
 (4) keep moving in the same direction
30. If ϵ_0 and μ_0 are the electric permittivity and magnetic permeability in free space, ϵ and μ are the corresponding quantities in a medium, the index of refraction of the medium is
 (1) $\sqrt{\frac{\epsilon_0 \cdot \mu}{\epsilon \cdot \mu_0}}$ (2) $\sqrt{\frac{\epsilon}{\epsilon_0}}$
 (3) $\sqrt{\frac{\epsilon_0 \cdot \mu_0}{\epsilon \cdot \mu}}$ (4) $\sqrt{\frac{\epsilon \cdot \mu}{\epsilon_0 \cdot \mu_0}}$
31. Three copper wires are of length and cross-sectional area (L, A) , $(2L, \frac{1}{2}A)$ and $(\frac{1}{2}L, 2A)$. Resistance is
 (1) minimum in wire of cross-sectional area $\frac{1}{2}A$
 (2) minimum in wire of cross-sectional area A
 (3) minimum in wire of cross-sectional area $2A$
 (4) same in all three cases
32. Two SHM's with same amplitude and time period when acting together in perpendicular directions with a phase difference of $\pi/2$, give rise to
 (1) elliptical motion (2) circular motion
 (3) straight motion (4) none of these
33. As a transverse wave strikes against a wall,
 (1) its phase changes by 180° , but velocity does not change
 (2) its phase does not change, but velocity changes
 (3) its velocity changes and phase too changes by 180°
 (4) nothing can be predicted about changes in its velocity and phase
34. An air-column in a pipe, which is closed at one end, will be in resonance with a vibrating tuning fork of frequency 256 Hz , if the length of the column in cm (velocity of sound in air is 340 ms^{-1})
 (1) 21.25 (2) 125
 (3) 62.50 (4) 33.2
35. The efficiency of a Carnot engine operating with reservoir temperatures of 100° C and -23° C will be
 (1) $\frac{100+23}{100}$ (2) $\frac{100-23}{100}$
 (3) $\frac{100+23}{373}$ (4) $\frac{100-23}{373}$
36. The equation of a progressive wave is $y = 60 \cos(1800t - 6x)$, where y is in microns, t in second and x in metres. The ratio of the maximum particle velocity to velocity of wave propagation is
 (1) 3.6×10^{-6} (2) 3.6×10^{-11}
 (3) 3.6×10^{-4} (4) 3.6
37. An astronomical telescope of ten-fold angular magnification has length of 44 cm . The focal length of the objective is
 (1) 4 cm (2) 40 cm
 (3) 44 cm (4) 440 cm
38. The focal length of converging lens is measured for violet, green and red colours. It is, respectively, f_v, f_g, f_r . We will find that
 (1) $f_v = f_r$ (2) $f_v > f_r$
 (3) $f_v < f_r$ (4) $f_g > f_r$
39. A black-body is at a temperature of 500 K . It emits energy at a rate which is proportional to
 (1) 500 (2) $(500)^2$
 (3) $(500)^4$ (4) $(500)^3$
40. A cylindrical resonance tube, open at both ends, has fundamental frequency, f , in air. If three-fourths of the length is dipped vertically in water, the fundamental frequency of the air column will be
 (1) $f/2$ (2) f
 (3) $2f$ (4) $3f/2$
41. The energy of the ground electronic state of hydrogen atom is -13.6 eV . The energy difference of the first excited state and the second excited state will be
 (1) 1.51 eV (2) 0.85 eV
 (3) 1.89 eV (4) 3.4 eV
42. A vessel contains a mixture of one mole of oxygen and two moles of nitrogen at 300 K . The ratio of the average rotational kinetic energy per O_2 molecule to that per N_2 molecule is
 (1) $1 : 1$
 (2) $1 : 2$
 (3) $2 : 1$
 (4) depends on the moments of inertia of the two molecules

43. A wave travelling in a stretched string is described by the equation,

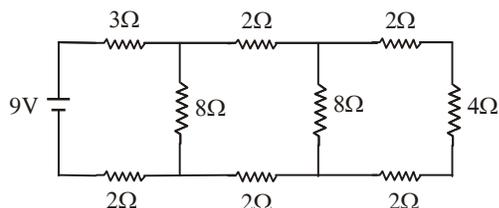
$$y = A \sin(kx - \omega t)$$

The maximum particle velocity is

- (1) $A \omega$ (2) ω / k
- (3) x / t (4) $\frac{d \omega}{dk}$
44. A ray of light travelling in transparent medium falls on a surface separating the medium from air at an angle of incidence of 45° . The ray undergoes total internal reflection. If n is the refractive index of the medium with respect to air, select the possible value(s) of n from the following :
- (1) 1.33 (2) 1.4
- (3) 1.5 (4) 1.25
45. The critical angle for water wrt air is θ . The angular range in which a fish just below the water surface can see the objects outside is

- (1) θ (2) $\frac{\theta}{2}$
- (3) 2θ (4) $\frac{3\theta}{2}$

46. In the circuit shown in the figure, the current through



- (1) the 3Ω resistor is 0.50 A
- (2) the 3Ω resistor is 0.25 A
- (3) the 4Ω resistor is 0.50 A
- (4) the 4Ω resistor is 0.25 A
47. A 100 V voltmeter of internal resistance $20 \text{ k}\Omega$ in series with a high resistance R , is connected to a 110 V line. The voltmeter reads 5 V. The value of R is
- (1) 210 $\text{k}\Omega$ (2) 315 $\text{k}\Omega$
- (3) 420 $\text{k}\Omega$ (4) 440 $\text{k}\Omega$
48. The frequency of a light wave in a material is $4 \times 10^{14} \text{ Hz}$ and wavelength is 5000 \AA . The refractive index of material will be
- (1) 1.4 (2) 1.33
- (3) 1.0 (4) 1.5

49. An electron of charge e move with a constant speed v along a circle of radius r . Its magnetic moment will be

- (1) evr (2) $\frac{evr}{2}$
- (3) $\pi r^2 ev$ (4) zero

50. Work function of a substance is 4.0 eV. The longest wavelength of light that can cause photoelectron emission from this substance is approximately

- (1) 540 nm (2) 400 nm
- (3) 310 nm (4) 220 nm

51. A gas can be liquefied by pressure alone when its temperature is

- (1) higher than its critical temperature
- (2) lower than its critical temperature
- (3) either of these
- (4) none of the above

52. The number of electrons in an atom with atomic number 105 having $(n + l) = 8$ are

- (1) 30 (2) 17
- (3) 15 (4) unpredictable

53. The half life of I^{131} is 8 day. Given a sample of I^{131} at $t = 0$, we can assert that

- (1) no nucleus will decay at $t = 4$ day
- (2) no nucleus will decay before $t = 8$ day
- (3) all nucleus will decay before $t = 16$ day
- (4) a given nucleus may decay at any time after $t = 0$

54. The correct order of decreasing polarisability of ion is

- (1) $\text{Cl}^-, \text{Br}^-, \text{I}^-, \text{F}^-$ (2) $\text{F}^-, \text{I}^-, \text{Br}^-, \text{Cl}^-$
- (3) $\text{I}^-, \text{Br}^-, \text{Cl}^-, \text{F}^-$ (4) $\text{F}^-, \text{Cl}^-, \text{Br}^-, \text{I}^-$

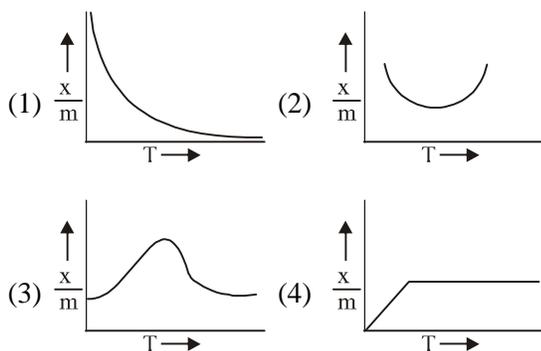
55. The hydrated salt $\text{Na}_2\text{SO}_4 \cdot n\text{H}_2\text{O}$, undergoes 55% loss in weight on heating and becomes anhydrous. The value of n will be

- (1) 5 (2) 3
- (3) 7 (4) 10

56. A metal oxide is reduced by heating it in a stream of hydrogen. It is found that after complete reduction, 3.15 g of the oxide have yielded 1.05 g of the metal. We may deduce that

- (1) the atomic weight of the metal is 8
- (2) the atomic weight of the metal is 4
- (3) the eq. wt. of the metal is 4
- (4) the eq. wt. of the metal is 8

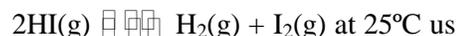
57. One mole of N_2H_4 loses 10 mole of electrons to form a new compound Y. Assuming that all nitrogen appears in the new compound, what is the oxidation number of nitrogen in Y (There is no change in the oxidation state of hydrogen) ?
 (1) -3 (2) +3
 (3) +5 (4) +1
58. Four colourless salt solution are placed in separate test tubes and a strip of copper is placed in each. Which solution finally turns blue ?
 (1) $Pb(NO_3)_2$ (2) $Zn(NO_3)_2$
 (3) $AgNO_3$ (4) $Cd(NO_3)_2$
59. Two platinum electrodes were immersed in a solution of cupric sulphate and electric current passed through the solution. After sometime it was found that the colour of copper sulphate disappeared with evolution of gas at the electrode. The colourless solution contains
 (1) Platinum sulphate (2) Copper hydroxide
 (3) Copper sulphate (4) Sulphuric acid
60. The eq. wt. of $Fe_2(SO_4)_3$, the salt to be used as an oxidant in an acidic solution is
 (1) (Mol. wt.)/1 (2) (Mol. wt.)/2
 (3) (Mol. wt.)/3 (4) (Mol. wt.)/5
61. A solution containing 8.6 g urea in one of aqueous solution containing 17 g of C_2H_5OH in 1000 g of water $K_f H_2O = 1.86 K \text{ molality}^{-1}$?
 (1) 348.9 (2) 34.89
 (3) 3489 (4) 861.2
62. Which plot is the adsorption isobar for chemisorption, where X is the amount of gas adsorbed on mass m (at constant pressure) at temperature T



63. The Ruben number which was proposed by Ostwald as an alternative to the Gold number in order to measure the protective efficiency of a lyophilic colloid may be defined as the

- (1) Mass in milligram of a colloid per 100 mL of solution which just prevents the colour change of standard sol of dye Congo-Rubin from red to violet when 0.16 g eq. KCl is added to it
 (2) Mass in gram of a colloid per 100 mL of solution which just prevents the colour change of standard sol of dye Congo-Rubin from red to violet when 0.1 M KCl is added to it
 (3) Mass in gram of a colloid per 100 mL of solution which just prevents the colour change of standard sol of dye Congo-Rubin from red to violet when 0.2 M KCl is added to it
 (4) Mass in gram of a colloid per 100 mL of solution which just prevents the colour change of standard sol of dye Congo-Rubin from red to violet when 1 M KCl is added to it

64. For a first order reaction $A \longrightarrow \text{Product}$, the initial concentration of A is 0.1 M and after 40 minute it becomes 0.025 M. Calculate the rate of reaction at reactant concentration of 0.01 M
 (1) $3.47 \times 10^{-4} M \text{ min}^{-1}$
 (2) $3.47 \times 10^{-5} M \text{ min}^{-1}$
 (3) $1.735 \times 10^{-6} M \text{ min}^{-1}$
 (4) $1.735 \times 10^{-4} M \text{ min}^{-1}$
65. The rate law of the reaction, $A + 2B \longrightarrow \text{Product}$ is given by $d[\text{product}]/dt = K[A]^2 \cdot [B]$. If A is taken in large excess, the order of the reaction will be
 (1) zero (2) 1
 (3) 2 (4) 3
66. If ΔG° for the reaction given below is 1.7 kJ; the equilibrium constant of the reaction,



- (1) 24.0 (2) 3.9
 (3) 2.0 (4) 0.5
67. The equivalent conductance of 0.1 N acetic acid is $5 \text{ cm}^2 \text{ ohm}^{-1} \text{ eq.}^{-1}$ at 298 K while λ_∞ is $390 \text{ cm}^2 \text{ ohm}^{-1} \text{ eq.}^{-1}$. The degree of dissociation of 0.1 N acetic acid will be
 (1) 0.0013 (2) 0.013
 (3) 0.13 (4) 0.5
68. A weak acid HX ($K_a = 1 \times 10^{-5}$) on reaction with NaOH gives NaZ. For 0.1 M aqueous solution of NaX, the % hydrolysis is

- (1) 0.001% (2) 0.01%
 (3) 0.15% (4) 1%
69. The conductivity of N/50 solution of KCl in a cell at 25°C is 0.002765 mho cm⁻¹. If the resistance of a cell containing this solution is 400 ohm, the cell constant is
 (1) 1.106 cm (2) 1.106 cm⁻¹
 (3) 1 cm (4) 1 cm
70. Which statements are correct ?
 (1) $2.303 \log \frac{P_2}{P_1} = \frac{\Delta H_{\text{vap.}}}{R_1} \left[\frac{T_2 - T_1}{T_1 T_2} \right]$ is Clausius-Clapeyron equation
 (2) $\frac{\Delta H_{\text{vap.}}}{\text{Boiling point}} = 88 \text{ J mol}^{-1} \text{ K}^{-1}$ is called Trouton's rule
 (3) Entropy is a measure of unavailable energy, i.e., unavailable energy = entropy × temperature
 (4) All of the above
71. For the reaction,
 $\text{H}_2(\text{g}) + \frac{1}{2} \text{O}_2(\text{g}) = \text{H}_2\text{O}(\text{l}) = \text{H}_2\text{O}(\text{l}), \Delta C_p = 7.63 \text{ cal/deg};$
 $\Delta H_{25^\circ\text{C}} = 68.3 \text{ kcal}$, what will be the value (in kcal) of ΔH at 100°C ?
 (1) $7.63 \times (373 - 298) - 68.3$
 (2) $7.63 \times 10^{-3} \times (373 - 298) - 68.3$
 (3) $7.63 \times 10^{-3} \times (373 - 298) + 68.3$
 (4) $7.63 \times (373 - 298) + 68.3$
72. For an ionic crystal of the general formula A⁺B⁻ and co-ordination number 6, the radius ratio will be
 (1) greater than 0.73
 (2) between 0.73 and 0.41
 (3) between 0.41 and 0.22
 (4) less than 0.22
73. An element X occurs in short period having configuration ns²np¹. The formula and nature of its oxide are
 (1) XO₃, basic (2) XO₃, acidic
 (3) X₂O₃, amphoteric
 (4) X₂O₃, basic
74. Slag coming out at the bottom of a blast furnace during extraction of iron from its ores, is used in making
 (1) Roads (2) Fertilizers
 (3) Plastics (4) Glass moulds
75. Which is not present in clear hard water ?
 (1) Mg(HCO₃)₂ (2) CaCl₂
 (3) MgSO₄ (4) MgCO₃
76. The element which does not dissolve in caustic soda is
 (1) Silicon (2) Aluminium
 (3) Zinc (4) Cadmium
77. Oxygen is obtained from bleaching powder by
 (1) The action of dilute acid
 (2) The action of alkali
 (3) Heating it with lime
 (4) Heating it with cobalt salt
78. _____ is the byproduct obtained in the Serpeck's process
 (1) Oxygen (2) Ammonia
 (3) Nitrogen dioxide (4) Nitric oxide
79. Which acid is formed when SiF₄ reacts with water ?
 (1) H₂SO₄ (2) H₂SiF₄
 (3) H₂SiF₆ (4) None
80. Which of the following has highest proton affinity ?
 (1) NH₃ (2) PH₃
 (3) H₂O (4) H₂S
81. Acidified iodates are reduced to by SO₂
 (1) Iodites (2) Iodide
 (3) Iodine (4) Chlorine
82. Halogen used in the preparation of insecticides is
 (1) I₂ (2) Cl₂
 (3) Br₂ (4) F₂
83. Geometry and hybridisation of Xe in XeOF₄ molecule is
 (1) Square planar, sp³d²
 (2) Square pyramidal, sp³d²
 (3) Tetrahedral, sp³
 (4) None of the above
84. A metal gives two chlorides 'A' and 'B'. 'A' gives black precipitate with NH₄OH and 'B' gives white. With KI 'B' gives a red precipitate soluble in excess of KI. 'A' and 'B' are respectively
 (1) HgCl₂ and Hg₂Cl₂
 (2) Hg₂Cl₂ and HgCl₂
 (3) HgCl₂ and HgCl₄²⁻
 (4) HgCl₄²⁻ and HgCl₂

85. A compound of a metal ion M^{x+} ($Z = 24$) has a spin only magnetic moment of $\sqrt{15}$ Bohr Magnetons. The number of unpaired electrons in the compound are
 (1) 2 (2) 4
 (3) 5 (4) 3
86. Identify the correct order of solubility of Na_2S , CuS and ZnS in aqueous medium
 (1) $CuS > ZnS > Na_2S$ (2) $ZnS > Na_2S > CuS$
 (3) $Na_2S > CuS > ZnS$ (4) $Na_2S > ZnS > CuS$
87. In which of the following compounds does not central atom obey EAN rule ?
 (1) $K_3Fe(CN)_6$ (2) $K_4Fe(CN)_6$
 (3) $Cu(NH_3)_4SO_4$ (4) All of these
88. On monochlorination of 2-methyl butane, the number of chiral compounds formed are
 (1) 2 (2) 4
 (3) 6 (4) 8
89. There is not test (Direct) for the detection of following in an organic compound
 (1) Cl (2) N
 (3) S (4) O
90. 0.759 g of a silver salt of a dibasic organic acid on ignition left 0.463 g metallic silver. The equivalent weight of acid is
 (1) 70 (2) 108
 (3) 60 (4) 50
91. 1-butyne on reaction with hot alkaline $KMnO_4$ gives
 (1) $CH_3CH_2CH_2COOH$
 (2) $CH_3CH_2COOH + CO_2$
 (3) CH_3CH_2COOH
 (4) $CH_3CH_2COOH + HCOOH$
92. Ethylidene dichloride on treatment with aq. KOH gives
 (1) CH_3CHO (2) $\begin{array}{c} CH_2OH \\ | \\ CH_2OH \end{array}$
 (3) $HCHO$ (4) $\begin{array}{c} CHO \\ | \\ CHO \end{array}$
93. The reaction, $RCl + NaI \xrightarrow{\text{Acetone}} R-I + NaCl$ is known as
 (1) Wurtz reaction
 (2) Fittig reaction
 (3) Frankland's reaction
 (4) Finkelstein's reaction
94. CH_3COOH reacts rapidly with
 (1) CH_3CHO (2) C_6H_5CHO
 (3) $(CH_3)_3COH$ (4) All of these
95. Formic acid is obtained when
 (1) $(CH_3COO)_2Ca$ is heated with conc. H_2SO_4
 (2) Calcium formate is heated with calcium acetate
 (3) Glycerol is heated with oxalic acid
 (4) Acetaldehyde is oxidised with $K_2Cr_2O_7$ and conc. H_2SO_4
96. IUPAC name of acrolein is
 (1) Propanal (2) Prop-2-en-1-al
 (3) Propan-2-ol (4) Prop-1-en-2-al
97. Hydrolysis of an ester gives acid A and alcohol B. The acid reduces Fehling's solution. Oxidation of alcohol B gives acid A. The ester is
 (1) Methyl formate (2) Ethyl formate
 (3) Methyl acetate (4) Ethyl acetate
98. How many primary amines are possible for the formula $C_4H_{11}N$?
 (1) 1 (2) 2
 (3) 3 (4) 4
99. Arrange the following CH_3NH_2 (I); $(CH_3)_2NH$ (II); $C_6H_5NH_2$ (III) and $(CH_3)_3N$ (IV) in increasing order of basic nature in aqueous medium
 (1) $II < I < IV < III$ (2) $III < IV < I < II$
 (3) $I < II < III < IV$ (4) $II < III < I < IV$
100. In the following reaction the catalyst used is

$$H_2C \begin{array}{l} \swarrow CH_2 - CH_2 \\ \searrow CH_2 - CH_2 \end{array} \longrightarrow \begin{array}{l} HC = HC \\ \swarrow HC - CH \searrow \end{array} CH + 3H_2$$

 (1) Cr_2O_3 (2) Al_2O_3
 (3) Zn dust (4) Cr_2O_3 and Al_2O_3

BOTANY & ZOOLOGY

101. Which of the following is true about the five kingdom classification system ?
- (1) All one-celled organisms are grouped in one kingdom
 - (2) All prokaryotes are grouped in a single kingdom
 - (3) All eukaryotes are grouped in one kingdom
 - (4) All heterotrophs are grouped in a single kingdom
102. A dominant autosomal disorder due to an allele on short arm of chromosome 4 characterized by atrophy of parts of brain is
- (1) Alzheimer's disease
 - (2) Huntington's disease
 - (3) Creutzfeldt – Jacob disease
 - (4) Tay Sach's disease
103. In the experiments conducted by Mendel, one of the following features was universally found :
- (1) Codominant
 - (2) Dominant-recessive
 - (3) Epistasis
 - (4) Incompletely dominant
104. What could be the ratio of the offsprings in a cross $AaBb \times AaBb$ if the gene B in recessive homozygous condition becomes epistatic on other
- (1) 9 : 7
 - (2) 9 : 3 : 4
 - (3) 13 : 3
 - (4) 12 : 3 : 1
105. In a population, the alleles T and t have frequencies P and q. What is the expected frequency of the genotypes TT, Tt and tt as predicted by the Hardy-Weinberg equation ?
- (1) $P^2 + 2Pq + q^2$
 - (2) $P^2 + Pq + q^2$
 - (3) $P + 2Pq + q^2$
 - (4) $P + 2Pq + q$
106. Multiple alleles control inheritance of
- (1) Phenyl ketonuria, human blood group
 - (2) Colour blindness, eye colour in *Drosophilla*
 - (3) Sickle cell anaemia, sex in *Drosophilla*
 - (4) Blood groups in human, eye colour in *Drosophilla*
107. Christmas disease is another name for
- (1) Sleeping sickness
 - (2) Haemophilia B
 - (3) Hepatitis B
 - (4) Down's syndrome
108. Frequency of double cross is
- (1) Reduced by interference
 - (2) Not affected by interference
 - (3) Increased by interference
 - (4) Either reduced or increased by interference
109. Assuming no linkage and no crossing over, segregation of Mendelian factors during meiosis occur at
- (1) Diplotene (terminalization)
 - (2) Metaphase I
 - (3) Anaphase I
 - (4) Anaphase II
110. In human beings 45 chromosomes / single X/XO abnormality causes
- (1) Down's syndrome
 - (2) Klinefelter's syndrome
 - (3) Turner's syndrome
 - (4) Edward's syndrome.
111. Nucleosome core is made of
- (1) H1, H2A, H2B, and H3 one molecule each
 - (2) H1, H2A, H2B, H4 two molecules each
 - (3) H2A, H2b, H3 and H4 one molecule each
 - (4) H2A, H2B, H3 and H4 two molecules each
112. Which one of the following is responsible for mental abnormalities in humans?
- (1) XXX and XY
 - (2) XX and XXX
 - (3) XO and XXXX
 - (4) XX and XO
113. Which of the following is Chargaff's rule ?
- (1) The ratio of A + T and G + C is of no relevance
 - (2) The ratio of A + T and G + C is variable in different species
 - (3) The ratio of A + T and G + C is variable in same species
 - (4) The ratio of A + T and G + C is same for all species
114. If a virus particle contains double stranded DNA with 200000 base pairs, what would be the length of DNA in virus
- (1) 68 mm
 - (2) 6.8 mm
 - (3) 0.68 mm
 - (4) 0.068 mm
115. Which of the following codons could not be deciphered by using homopolymer method?
- (1) UUU
 - (2) AAA
 - (3) CCC
 - (4) GGG
116. In *Lac* operon the promoter gene is located
- (1) In front of structural gene
 - (2) In between operator and the regulator genes
 - (3) In the middle of structural genes
 - (4) At the end of the structural genes

117. DNA probes are
- (1) DNA segments having radioactive isotopes
 - (2) DNA mixed with gel during electrophoresis
 - (3) Mutant DNA
 - (4) DNA used in PCR
118. Molecular scissors used in genetic engineering is
- (1) DNA helicase
 - (2) Restriction endonuclease
 - (3) DNA ligase
 - (4) DNA polymerase
119. Androecium in the family cruciferae consists of
- (1) 2 outer long and four inner short stamens
 - (2) 2 outer short and four inner long stamens
 - (3) 4 outer long and two inner short stamens
 - (4) 4 outer short and two inner long stamens
120. In *Amorphophallus*, vegetative reproduction is carried out through
- (1) Bulbs
 - (2) Bulbils
 - (3) Corm
 - (4) Rhizome
121. 'Censer Mechanism' of fruit dispersal is found in
- (1) *Papaver*
 - (2) *Argemone*
 - (3) *Aristolochia*
 - (4) All of these
122. Green leaf-like modified aerial stem/branches with a single internode are called
- (1) Phylloclades
 - (2) Phyllodes
 - (3) Bulbils
 - (4) Cladodes
123. Thorn is a modified branch because
- (1) It is a hard, straight and pointed structure
 - (2) It is a part of the plant
 - (3) It arises in the axil of a leaf
 - (4) It looks like a branch
124. Silicula fruit is a characteristic feature of
- (1) Mustard
 - (2) Radish
 - (3) Candytuft
 - (4) Marigold
125. Epipetalous stamens with free filaments but fused anthers are found in
- (1) Asteraceae
 - (2) Convolvulaceae
 - (3) Solanaceae
 - (4) Asclepiadaceae
126. A monocot flower can be differentiated from a dicot flower as
- (1) Monocot flowers are very large as compared to dicot flowers
 - (2) Monocot flowers are very small as compared to dicot flowers
 - (3) Monocot flowers have perianth
 - (4) None of these
127. Which living cells provide tensile and mechanical strength ?
- (1) Collenchyma
 - (2) Sclerenchyma
 - (3) Phloem
 - (4) Sclereids
128. Which of the following is not a characteristic of meristematic cells?
- (1) Thin wall
 - (2) Small nucleus
 - (3) Compactly arranged without intercellular spaces
 - (4) Metabolically active
129. Latex vessels are found in
- (1) *Cannabis*
 - (2) Banyan
 - (3) *Achras*
 - (4) *Euphorbia*
130. Rate of transpiration is high in
- (1) C_4 plants
 - (2) C_3 plants
 - (3) Both C_4 and C_3 plants
 - (4) None of these
131. Deficiency of manganese prevents
- (1) Growth of pollen tube
 - (2) Hill reaction
 - (3) Auxin synthesis
 - (4) Amylase activity
132. A crop plant that can grow well in nitrogen deficient soils without addition of manure is
- (1) *Cajanus cajan*
 - (2) *Gossypium herbaceum*
 - (3) *Helianthus annuus*
 - (4) *Allium sativum*
133. Photorespiration is also known as
- (1) Glycolate cycle
 - (2) C_2 cycle
 - (3) Warburg's effect
 - (4) All of these
134. During photosynthesis when PGA is changed into phosphoglyceraldehyde, which of the following enzyme is involved ?
- (1) Oxidase
 - (2) Reductase
 - (3) Dehydrogenase
 - (4) Isomerase
135. The mechanism of ATP formation both in chlorophyll and mitochondria is explained by
- (1) Cholodny-Went's model
 - (2) Chemiosmotic theory of Mitchell
 - (3) Munch's mass flow model
 - (4) Relay pump theory of Godlewski
136. Decline in the activity of the enzyme hexokinase by glucose-6-phosphate is caused by
- (1) Non-competitive inhibition
 - (2) Competitive inhibition
 - (3) Allosteric modulation
 - (4) Increased by substrate concentration

137. Seed is defined as fertilized ovule, one may expect to find seeds in
- (1) Gymnosperms only
 - (2) Angiosperms only
 - (3) All vascular plants
 - (4) All phanerogams
138. If a sporangium is derived from a single cell, it is called
- (1) Eusporangiate
 - (2) Heterosporangiate
 - (3) Leptosporangiate
 - (4) None of these
139. Formation of sporophyte directly from gametophyte is known as
- (1) Apospory
 - (2) Apogamy
 - (3) Diplospory
 - (4) Parogamy
140. The embryo sac in an angiosperm is a
- (1) Megagametophyte
 - (2) Megasporangium
 - (3) Megaspore
 - (4) Megaspore mother cell
141. Ethylene is formed from the amino acid
- (1) Glycine
 - (2) Methionine
 - (3) Tryptophan
 - (4) Leucine
142. Which of the following are all SDP?
- (1) Potato, sugarcane, tobacco
 - (2) Rice, radish, wheat
 - (3) Sugarcane, lettuce, opium poppy
 - (4) All of these
143. The biological activity of IAA is tested by
- (1) α -amylase test
 - (2) *Avena* curvature test
 - (3) Soyabean callus test
 - (4) *Xanthium* leaf disc test
144. Movements of guard cells are examples of
- (1) Turgor movements
 - (2) Tropic movements
 - (3) Tactic movements
 - (4) Growth movements
145. Halophytes are able to grow in a concentrated salt solution because they
- (1) Can absorb water against concentration gradient
 - (2) Accumulate high concentration of KCl
 - (3) Possess a pigment bacteriorhodopsin
 - (4) Have branched hydrocarbon chains in the phospholipids of their cell membranes
146. Climax community mainly depends on
- (1) Pool of available nutrients
 - (2) Bed rock
 - (3) Soil
 - (4) Climate
147. Keystone species in an ecosystem are those
- (1) Present in maximum number
 - (2) That are most frequent
 - (3) Attaining a large biomass
 - (4) Contributing to ecosystem properties
148. Differentiation of shoot is controlled by
- (1) High gibberellin : cytokinin ratio
 - (2) High auxin : cytokinin ratio
 - (3) High cytokinin : auxin ratio
 - (4) High auxin : gibberellin ratio
149. How did green revolution occur in India ?
- (1) Due to introduction of Mexican varieties of wheat
 - (2) Better farm management
 - (3) Better irrigation and farm facilities
 - (4) Better use of fertilisers
150. NEERI is situated at
- (1) New Delhi
 - (2) Nagpur
 - (3) Bhopal
 - (4) Baroda
151. Match the name of the scientist of column I with the field of study in column II
- | Column I | Column II |
|----------------------|------------------------|
| A. Norman E. Borlaug | I. First man made gene |
| B. Ian Wilmut | II. Discovery of rDNA |
| C. Stanley Cohen | III. Green revolution |
| D. H.G. Khorana | IV. Dolly sheep |
- (1) A - III, B - II, C - IV, D - I
 - (2) A - III, B - IV, C - II, D - I
 - (3) A - IV, B - III, C - I, D - II
 - (4) A - II, B - I, C - III, D - IV
152. Correct order is
- (1) Palaeozoic - Archaeozoic - Coenozoic
 - (2) Archaeozoic - Palaeozoic - Proterozoic
 - (3) Palaeozoic - Mesozoic - Coenozoic
 - (4) Mesozoic - Archaeozoic - Proterozoic
153. Evolutionary convergence is development of
- (1) Common set of characters in groups of different ancestry
 - (2) Dissimilar characters in closely related groups
 - (3) Common set of characters in closely related groups
 - (4) Random mating

154. The statement "nothing in biology makes sense except in the light of evolution" was given by
 (1) Dobzhansky (2) Darwin
 (3) Hooker (4) Wallace
155. Among the following sets mark the odd man out
 (1) Paddles of turtle and fins of fishes
 (2) Wings of bat and wings of bird
 (3) Sting of honey bee and sting of wasp
 (4) Nails of human and horns of cows
156. Which of the following furnishes direct evidences in favour of organic evolution ?
 (1) Embryology (2) Palaeontology
 (3) Morphology (4) Biochemistry
157. Industrial melanism is an example of
 (1) Drug resistance
 (2) Darkening of skin due to smoke from industries
 (3) Protective resemblance with the surroundings
 (4) Defensive adaptation of skin against ultra violet radiations
158. "Every cell of the body contributes gemmules to the germ cells and so shares in the transmission of inherited characters". This theory is known as
 (1) Theory of inheritance of acquired characteristic
 (2) Theory of germ plasma
 (3) Theory of pangenesis
 (4) Theory of mutations
159. Which is correct ?
 (1) Neanderthal Man is direct ancestor of human
 (2) *Homo erectus* is direct ancestor of man
 (3) Cro-Magnon was found in Ethiopia
 (4) *Australopithecus* is real ancestor of modern man
160. Temporal isolation means
 (1) Offsprings are unviable or infertile
 (2) Breeding seasons of the populations are different
 (3) The habits of two species are different
 (4) Genitalia of the two groups are different
161. The members of the following group have exclusively open blood vascular system
 (1) Mollusca (2) Arthropoda
 (3) Both of these (4) Annelida
162. Which of the following feature is not applicable to all echinoderms ?
 (1) Free moving (2) Marine
 (3) Eucoelomate (4) Mesodermal skeleton
163. *Bombyx mori*, a silk moth, is a
 (1) Holometabola insect like mosquito
 (2) Hemimetabola insect like bedbug
 (3) Holometabola insect like cockroach
 (4) Hemimetabola insect like butterfly
164. Which of the following animal is not metamerically segmented ?
 (1) Millipede (2) Earthworm
 (3) *Taenia* (4) Housefly
165. One of the following is not a trait of prototherians
 (1) Egg laying
 (2) Absence of teats over mammary glands
 (3) Absence of corpus callosum
 (4) Presence of testes outside the abdominal cavity
166. Bat, whale and human share the following trait
 (1) Hair
 (2) Placenta
 (3) Nocturnal
 (4) Position of mammary glands
167. Skull of birds is
 (1) Dicondylic (2) Monocondylic
 (3) Amphicondylic (4) Tricondylic
168. What is correct ?
 (1) *Archaeopteryx* is connecting link between Aves and Mammalia
 (2) Sea Horse is connecting link between fish and horse
 (3) Duck billed platypus is connecting link between reptiles and mammals
 (4) Hydra is connecting link between protozoa and metazoa
169. In ATP, the high energy bond is the one which links
 (1) Adenine with phosphate
 (2) Adenine with ribose
 (3) Ribose with phosphate
 (4) Phosphate to phosphate
170. Which of the following is connected by two hydrogen bonds ?
 (1) Adenine and guanine
 (2) Adenine and thymine
 (3) Thymine and guanine
 (4) Cytosine and guanine

171. Proteins in silk fibre are
- (1) Fibrin and serin
 - (2) Chondrin and mucin
 - (3) Fibroin and sericine
 - (4) Collagen and elastin
172. One of the following is common in earthworm and cockroach
- (1) Double solid and ventral nerve cord
 - (2) Presence of nephridia
 - (3) Equal body segments
 - (4) None of the above
173. The four pairs of pulsating hearts in *Pheretima* are located in
- (1) 7th, 9th and 12th, 13th segments
 - (2) 13th, 14th and 17th, 19th segments
 - (3) 10th, 12th and 16th, 17th segments
 - (4) 7th, 8th and 10th, 11th segments
174. A dorsal sclerite of cockroach is called
- (1) Pleuron
 - (2) Plastron
 - (3) Tergum
 - (4) Sternum
175. The wings are either rudimentary or vestigial in
- (1) Female *Blatta orientalis*
 - (2) Male *Blatta orientalis*
 - (3) Female *Periplaneta americana*
 - (4) Male *Periplaneta americana*
176. Ciliated epithelium lines the
- (1) Tracheal and fallopian tube
 - (2) Bile duct and ureter epithelium
 - (3) Trachea and oesophagus
 - (4) Pharyngeal and stomach mucosae
177. Brunner's glands are found in
- (1) Liver
 - (2) Mucosa of intestine
 - (3) Submucosa of first part of small intestine
 - (4) Mucosa of duodenum
178. The camel's hump is composed of a tissue which provides water when oxidised. It is
- (1) Skeletal tissue
 - (2) Areolar tissue
 - (3) Adipose tissue
 - (4) Muscular tissue
179. Steapsin acts on
- (1) Peptide bonds
 - (2) Glycosidic bonds
 - (3) Ester bonds
 - (4) Hydrogen bonds
180. An adult person consumes boiled potato. Mark the correct statement regarding the digestion of food components
- (1) Cellulose will be digested by cellulase
 - (2) Starch will not be digested
 - (3) Lactase will digest carbohydrates
 - (4) DNA will be digested by pancreatic enzymes
181. The organ of sound production in birds is
- (1) Larynx and is present in the base of trachea
 - (2) Syrinx, and is present at the base of trachea
 - (3) Larynx, and is present at the top of trachea
 - (4) Syrinx, and is present at the top of trachea
182. Exposure of carbon monoxide (from coal gas) is extremely dangerous and can kill a patient because
- (1) The compound carboxy-haemoglobin is formed with haemoglobin which can gradually clot the blood resulting in circulatory failure
 - (2) Carboxy-haemoglobin reduces the ability of blood to transport oxygen by rupturing a vast majority of erythrocytes
 - (3) Carboxy-haemoglobin greatly modifies the structure of haemoglobin, thus making it lose its affinity for oxygen
 - (4) The compound formed, carboxy-haemoglobin does not allow RBCs to act for their respiratory function
183. Ductus arteriosus in foetus
- (1) Arises from left ventricle
 - (2) Arises from right ventricle
 - (3) Connects systemic and pulmonary aorta
 - (4) Connects right and left atria
184. In ECG the elevation of ST-segment indicates
- (1) Acute myocardial infarction
 - (2) Insufficient supply of oxygen to the heart muscles
 - (3) Inflammation of atria
 - (4) Rheumatic heart disease
185. Body fluid in sharks and coelacanth is
- (1) Hypoionic and Hyperosmotic to sea water
 - (2) Hyperionic and Hyperosmotic to sea water
 - (3) Hypoionic and Hypoosmotic to sea water
 - (4) Hyperionic and Hypoosmotic to sea water
186. The urine under normal conditions does not contain glucose because
- (1) The normal blood sugar is fructose
 - (2) Glucose of blood is not filtered in the glomerulus
 - (3) Glucose in glomerular filtrate is reabsorbed in the uriniferous tubules
 - (4) Glucose in glomerular filtrate is converted into glycogen

187. Eye muscles are innervated by
- (1) Oculomotor, abducens and vagus
 - (2) Oculomotor, trochlear and abducens
 - (3) Oculomotor, abducens and facial
 - (4) Oculomotor, facial and vagus
188. Foramen of Monro is an aperture between
- (1) Third and fourth ventricles
 - (2) Rhinocoel and diacoel
 - (3) Lateral and third ventricles
 - (4) Diacoel and metacoel
189. Appetite and satiety centres of brain are present in
- (1) Cerebral hemispheres
 - (2) Hypothalamus
 - (3) Cerebellum
 - (4) Medulla oblongata
190. Tears are secreted by
- (1) Meibomian glands
 - (2) Lacrimal glands
 - (3) Harderian glands
 - (4) Sebacious glands
191. Osteoporosis is caused by
- (1) Ca^{2+} deficiency
 - (2) Hypersecretion of calcitonin
 - (3) K^+ deficiency
 - (4) Hypersecretion of parathormone
192. Graafian follicles are found in
- (1) Ovaries of all vertebrates
 - (2) Ovaries of Amniotes
 - (3) Testes of mammals
 - (4) None of the above
193. After ovulation the oocyte is in the preparation of
- (1) Mitotic division
 - (2) First meiotic division
 - (3) Second meiotic division
 - (4) Implantation
194. Which pathway of the male reproductive system is correct for the sperms transportation?
- (1) Vas efferentia → Vas deferens → Epididymis
 - (2) Vas deferens → Epididymis → Seminal vesicle
 - (3) Epididymis → Vas deferens → Urethra
 - (4) Rate testis → Epididymis → Vas efferentia
195. Polycithal and telolecithal eggs are present in
- (1) Housefly
 - (2) Hyla
 - (3) House sparrow
 - (4) None of these
196. The average number of children that would be born to a woman during her life time, is called
- (1) Biotic potential
 - (2) Total fertility rate (TFR)
 - (3) Reproductive potential
 - (4) Fecundity
197. National dairy research institute is located in
- (1) Lucknow
 - (2) Ranchi
 - (3) Karnal
 - (4) UP
198. Blue revolution is related to the following field
- (1) Dairy products
 - (2) Fisheries
 - (3) Egg production
 - (4) Agriculture
199. Cloacal thymus is another name of
- (1) Endostyle
 - (2) Neural complex
 - (3) Bursa Fabricii
 - (4) Thymus itself
200. Vaccines produced through genetic engineering are considered safe because they
- (1) Are active form of antigens
 - (2) Are the least active forms
 - (3) Contain antibodies formed for coat proteins only
 - (4) Contain antibodies against whole antigen

ANSWERS

Physics

1.	(1)	2.	(3)	3.	(3)	4.	(4)	5.	(1)
6.	(4)	7.	(3)	8.	(4)	9.	(2)	10.	(3)
11.	(4)	12.	(4)	13.	(4)	14.	(3)	15.	(1)
16.	(3)	17.	(4)	18.	(1)	19.	(2)	20.	(2)
21.	(2)	22.	(4)	23.	(1)	24.	(1)	25.	(3)
26.	(2)	27.	(2)	28.	(1)	29.	(3)	30.	(4)
31.	(3)	32.	(2)	33.	(3)	34.	(4)	35.	(3)
36.	(3)	37.	(2)	38.	(3)	39.	(3)	40.	(3)
41.	(3)	42.	(1)	43.	(1)	44.	(3)	45.	(3)
46.	(4)	47.	(3)	48.	(4)	49.	(4)	50.	(3)

Chemistry

51.	(2)	52.	(2)	53.	(4)	54.	(3)	55.	(4)
56.	(3)	57.	(2)	58.	(4)	59.	(4)	60.	(2)
61.	(1)	62.	(3)	63.	(1)	64.	(1)	65.	(2)
66.	(4)	67.	(2)	68.	(2)	69.	(4)	70.	(4)
71.	(2)	72.	(2)	73.	(3)	74.	(1)	75.	(4)
76.	(4)	77.	(1)	78.	(2)	79.	(3)	80.	(1)
81.	(3)	82.	(2)	83.	(2)	84.	(2)	85.	(4)
86.	(4)	87.	(2)	88.	(2)	89.	(4)	90.	(1)
91.	(4)	92.	(1)	93.	(4)	94.	(1)	95.	(3)
96.	(2)	97.	(1)	98.	(4)	99.	(2)	100.	(2)

Botany

101.	(2)	102.	(2)	103.	(2)	104.	(2)	105.	(1)
106.	(4)	107.	(2)	108.	(1)	109.	(3)	110.	(3)
111.	(4)	112.	(3)	113.	(2)	114.	(4)	115.	(4)
116.	(2)	117.	(1)	118.	(2)	119.	(2)	120.	(3)
121.	(4)	122.	(4)	123.	(3)	124.	(3)	125.	(1)
126.	(3)	127.	(1)	128.	(2)	129.	(3)	130.	(2)
131.	(2)	132.	(1)	133.	(4)	134.	(3)	135.	(2)
136.	(3)	137.	(4)	138.	(3)	139.	(2)	140.	(1)
141.	(2)	142.	(1)	143.	(2)	144.	(1)	145.	(2)
146.	(4)	147.	(4)	148.	(3)	149.	(1)	150.	(2)

Zoology

151	(2)	152	(3)	153	(1)	154	(1)	155	(1)
156	(2)	157	(3)	158	(3)	159	(2)	160	(2)
161	(2)	162	(1)	163	(1)	164	(3)	165	(4)
166	(2)	167	(2)	168	(3)	169	(4)	170	(2)
171	(3)	172	(1)	173	(1)	174	(3)	175	(1)
176	(3)	177	(1)	178	(3)	179	(3)	180	(4)
181	(2)	182	(4)	183	(3)	184	(1)	185	(1)
186	(3)	187	(2)	188	(3)	189	(2)	190	(2)
191	(4)	192	(4)	193	(3)	194	(3)	195	(3)
196	(2)	197	(3)	198	(2)	199	(3)	200	(3)