1to1 GURU
Learn to Lead, Learn to Succeed

Date :-06/04/2022 **Time :-200 Minutes** **Exam Name :-1to1Guru-TestSeries#13** **Mark :- 720**

PHYSTCS SECTION A

1. A particle covers 4m, 5m, 6m, and 7m, in 3rd, 4th, 5th and 6th second respectively. The particle starts

(a) With an initial non-zero velocity and moves with uniform acceleration

(b) From rest and moves with uniform velocity

(c) With an initial velocity and moves with uniform velocity

(d) From rest and moves with uniform acceleration

2. The truth table shown in figure is for

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

(a) XOR **(b)** AND **(c)** XNOR **(d)** OR

3. If in a voltaic cell, 5 g of zinc is consumed, we will get how many ampere hour (given that ECE of zinc is $3.38 \times 10^{-7} \text{kgC}^{-1}$)

(a) 2.05 **(b)** 8.2 **(c)** 4.1 **(d)** $5 \times 3.338 \times 10^{-7}$

4. Two sources of sound placed to each other, are emitting progressive waves given by $y_1 = 4 \sin 600\pi t$ and $y_2 = 5 \sin 608\pi t$. An observer located near these two sources of sound will hear

(a) 4 beats per second with intensity ratio 25 : 16 between waxing and waning

(b) 8 beats per second with intensity ratio 25 : 16 between waxing and waning

(c) 8 beats per second with intensity ratio 81 : 1 between waxing and waning

(d) 4 beats per second with intensity ratio 81 : 1 between waxing and waning

5. Two parallel slits $0.6\ mm$ apart are illuminated by light source of wavelength 6000 Å . The distance between two consecutive dark fringes on a screen $1\ m$ away from the slits is

(a) $1\ mm$ **(b)** $0.01\ mm$ **(c)** $0.1\ m$ **(d)** $10\ m$

6. The mass number of He is 4 and that of sulphur is

32. The radius of sulphur nucleus is larger than that of helium by the factor of (1995)

(a) 4 **(b)** 2 **(c)** 8 **(d)** $\sqrt{8}$

7. A step-down transformer is connected to $2400\ volts$ line and 80 amperes of current is found to flow in output load. The ratio of the turns in primary and secondary coil is 20 : 1. If transformer efficiency is 100%, then the current flowing in primary coil will be

(a) $1600\ A$ **(b)** $20\ A$ **(c)** $4\ A$ **(d)** $1.5\ A$

8. A vertical circular coil of radius 0.1 m and having 10 turns carries a steady current. When the plane of the coil is normal to the magnetic meridian, a neutral point is observed at the centre of the coil. If $B_H = 0.314 \times 10^{-4}$ the current in the coil is

(a) 0.5 A **(b)** 0.25 A **(c)** 2 A **(d)** 1 A

9. A horizontal straight wire 10 m long extending from east to west is falling with a speed of 5.0 ms^{-1}, at right angles to the horizontal component of the earth s magnetic field of strength $0.30 \times 10^{-4} \text{Wbm}^{-2}$. the instantaneous value of the induced potential gradient in the wire, from west to east, is

(a) $+1.5 \times 10^{-3}\ \text{Vm}^{-1}$ **(b)** $-1.5 \times 10^{-3}\ \text{Vm}^{-1}$

(c) $+1.5 \times 10^{-4}\ \text{Vm}^{-1}$ **(d)** $-1.5 \times 10^{-4}\ \text{Vm}^{-1}$

10. A bomb is dropped from an aeroplane flying horizontally with a velocity $469\ \text{ms}^{-1}$ at an altitude of 980 m. The bomb will hit the ground after a time

(a) $2\ s$ **(b)** $\sqrt{2}\ s$ **(c)** $5\sqrt{2}\ s$ **(d)** $10\sqrt{2}\ s$

11. A body comes running and sits on a rotating platform. What is conserved

(a) Linear momentum **(b)** Kinetic energy

(c) Angular momentum **(d)** None of the above

12. When ${}_{88}\text{Ra}^{236}$ decays in a series by emission of 3α -particles and one β -particle, isotope X formed is

(a) ${}_{83}X^{224}$ **(b)** ${}_{84}X^{218}$ **(c)** ${}_{84}X^{220}$ **(d)** ${}_{82}X^{223}$

13. At a given place where, acceleration due to gravity is g ms^{-2}, a sphere of lead of density $d\ \text{kgm}^{-2}$ is gently released in a column of liquid of density $\rho\ \text{kgm}^{-3}$. If $d > \rho$, the sphere will

(a) Fall vertically with an acceleration of g ms^{-2}

(b) Fall vertically with no acceleration

(c) Fall vertically with an acceleration g $\left(\frac{d-\rho}{d}\right)$

(d) Fall vertically with an acceleration ρ/d

14. The displacement x (in metre) of a particle in simple harmonic motion is related to time t (in second) as $x = 0.01\cos\left(\pi t + \frac{\pi}{4}\right)$ The frequency of the motion will be

(a) 0.5 Hz **(b)** 1.0 Hz **(c)** $\frac{\pi}{2}$ Hz **(d)** π Hz

15. If $R_p = 7k\Omega, g_m = 2.5\,millimho$, then on increasing plate voltage by $50V$, how much the grid voltage is changed so that plate current remains the same

(a) $-2.86\,V$ **(b)** $-4\,V$ **(c)** $+4\,V$ **(d)** $+2\,V$

16. Select the WRONG statement.

(a) In U.C.M. linear speed is constant.

(b) In U.C.M. linear velocity is constant.

(c) In U.C.M. magnitude of angular momentum is constant.

(d) In U.C.M. angular velocity is constant.

17. If the wavelength of light is 4000 Å, then the number of waves in $1\,mm$ length will be

(a) 25 **(b)** 0.25 **(c)** 0.25×10^4 **(d)** 25×10^4

18. At a certain instant, a body of mass 0.4 kg has a velocity of $(8\hat{i} + 6\hat{j})ms^{-1}$. The kinetic energy of the body is

(a) 10 J **(b)** 40 J **(c)** 20 J **(d)** None of these

19. In space communication, the sound waves can be sent from one place to another

(a) Through space **(b)** Through wires

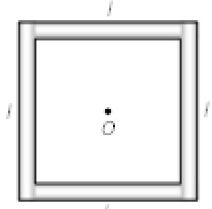
(c) By superimposing it on undamped electromagnetic waves

(d) By superimposing it on damped electromagnetic waves

20. A glass flask of volume one *litre* at 0°C is fille, level full of mercury at this temperature. The flask and mercury are now heated to 100°C. How much mercury will spill out, if coefficient of volume expansion of mercury is $1.82 \times 10^{-4}/°C$ and linear expansion of glass is $0.1 \times 10^{-4}/°C$ respectively

(a) $21.2\,cc$ **(b)** $15.2\,cc$ **(c)** $1.52\,cc$ **(d)** $2.12\,cc$

21. Four thin rods of same mass M and same length l, form a square as shown in figure. Moment of inertia of this system about an axis through centre O and perpendicular to its plane is



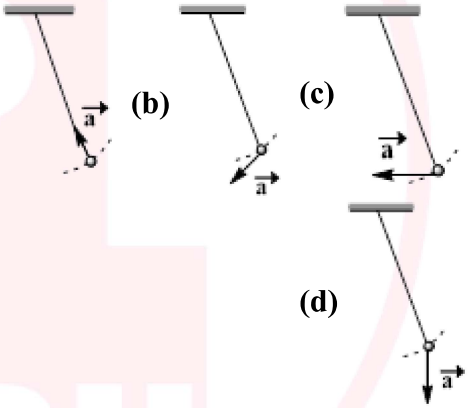
(a) $\frac{4}{3}Ml^2$ **(b)** $\frac{Ml^2}{3}$ **(c)** $\frac{Ml^2}{6}$ **(d)** $\frac{2}{3}Ml^2$

22. The magnetic field amplitude of an electromagnetic wave is $2 \times 10^{-7}T$. It s electric field amplitude if the wave is travelling in free space is :

(a) $6Vm^{-1}$ **(b)** $60Vm^{-1}$ **(c)** $10/6Vm^{-1}$

(d) None of these

23. A simple pendulum is oscillating without damping. When the displacement of the bob is less than maximum, its acceleration vector $\vec{a}$ is correctly show in figure.



24. Three long straight wires are connected parallel to each other across a battery of negligible internal resistance. The ratio of their resistances are $3:4:5$. What is the ratio of distances of middle wire from the others if the net force experienced by it is zero

(a) $4:3$ **(b)** $3:1$ **(c)** $5:3$ **(d)** $2:3$

25. An $e.m.f.\ E = 4\cos(1000t)\,volt$ is applied to an LR-circuit of inductance $3\,mH$ and resistance $4\,ohms$. The amplitude of current in the circuit is

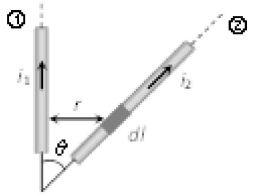
(a) $\frac{4}{\sqrt{7}}A$ **(b)** $1.0\,A$ **(c)** $\frac{4}{7}A$ **(d)** $0.8\,A$

26. In Young s double-slit experiment, an interference pattern is obtained on a screen by a light of wavelength 6000 Å, coming from the coherent sources S_1 and S_2. At certain point P on the screen third dark fringe is formed. Then the path difference $S_1P - S_2P$ in microns is

(a) 0.75 **(b)** 1.5 **(c)** 3.0 **(d)** 4.5

27. Wires 1 and 2 carrying currents i_1 and i_2

respectively are inclined at an angle θ to each other. What is the force on a small element dl of wire 2 at a distance of r from wire 1 (as shown in figure) due to the magnetic field of wire 1



(a) $\frac{\mu_0}{2\pi r} i_1 i_2\, dl \tan\theta$ **(b)** $\frac{\mu_0}{2\pi r} i_1 i_2\, dl \sin\theta$

(c) $\frac{\mu_0}{2\pi r} i_1 i_2\, dl \cos\theta$ **(d)** $\frac{\mu_0}{4\pi r} i_1 i_2\, dl \sin\theta$

28. A potentiometer wire of length $1m$ and resistance $10\ \Omega$ is connected in series with a cell of $emf\ 2V$ with internal resistance $1\ \Omega$ and a resistance box including a resistance R. If potential difference between the ends of the wire is $1\ mV$, the value of R is

(a) $20000\ \Omega$ **(b)** $19989\ \Omega$ **(c)** $10000\ \Omega$ **(d)** $9989\ \Omega$

29. A star is moving towards the earth with a speed of $4.5 \times 10^6 m/s$. If the true wavelength of a certain line in the spectrum received from the star is 5890 Å, its apparent wavelength will be about $(c = 3 \times 10^8 m/s)$

(a) 5890Å **(b)** 5978Å **(c)** 5802Å **(d)** 5896Å

30. In space communication, the information can be passed from one place to another at a distance of 100 km in

(a) 1 s **(b)** 0.5 s **(c)** 0.003 s **(d)** None of these

31. A pan with set of weights is attached with a light spring. When disturbed, the mass-spring system oscillates with a time period of 0.6 s. When some additional weights are added then time period is $0.7s$. The extension caused by the additional weights is approximately given by

(a) 1.38 *cm* **(b)** 3.5 *cm* **(c)** 1.75 *cm* **(d)** 2.45 *cm*

32. A particle is projected with velocity $2\sqrt{gh}$ so that it just clears two walls of equal height h, which are at a distance of $2h$ from each other. What is the time interval of passing between the two walls?

(a) $\frac{2h}{g}$ **(b)** $\sqrt{\frac{2h}{g}}$ **(c)** $\sqrt{\frac{h}{g}}$ **(d)** $2\sqrt{\frac{h}{g}}$

33. In which one of the following regions of the electromagnetic spectrum will the vibrational motion of molecules give rise to absorption

(a) Ultraviolet **(b)** Microwaves **(c)** Infrared

(d) Radio waves

34. A fan is making 600 revolutions per $minute$. If after some time it makes 1200 revolutions per $minute$, then increase in its angular velocity is

(a) $10\pi\ rad/sec$ **(b)** $20\pi\ rad/sec$

(c) $40\pi\ rad/sec$ **(d)** $60\pi\ rad/sec$

35. A wheel having moment of inertia $2\ \text{kg m}^2$ about its vertical axis, rotates at the rate of 60rpm about this axis. The torque which can stop the wheel's rotation in one minute would be (2004)

(a) $\frac{2\pi}{15}$ N m **(b)** $\frac{\pi}{12}$ Nm **(c)** $\frac{\pi}{15}$ Nm **(d)** $\frac{\pi}{18}$ Nm

SECTION B (Solve Any 10)

36. If both the object and image are at infinite distance from a refracting telescope its magnifying power will be equal to

(a) The sum of the focal lengths of the objective and the eyepiece

(b) The different of the focal lengths of the two lenses

(c) The ratio of the focal length of the objective and eyepiece

(d) The ratio of the focal length of the eyepiece and objective

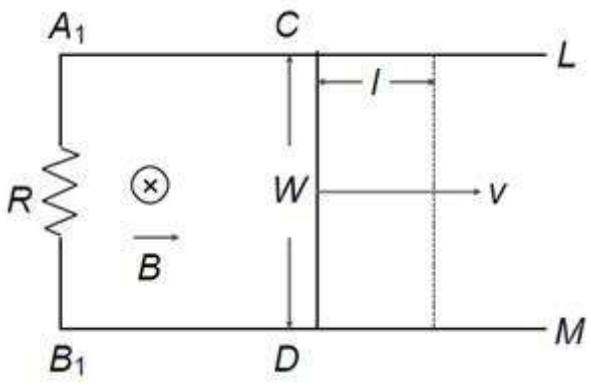
37. 200 cal of heat is given to a heat engine so that it rejects 150 cal of heat, if source temperature is $400\ K$, then the sink temperature is

(a) $300\ K$ **(b)** $200\ K$ **(c)** $100\ K$ **(d)** $50\ K$

38. The ratio of minimum to maximum wavelength in Balmer series is

(a) 5:9 **(b)** 5:36 **(c)** 1:4 **(d)** 3:4

39. Two parallel wires A_1L *and* B_1M placed at a distance w are connected by a resistor R and placed in a magnetic field B which is perpendicular to the plane containing the wires (see figure). Another wire CD now connects the two wires perpendicularly and made to slide with velocity v through distance L. The power developed is



(a) $B\frac{lv}{R}$ **(b)** $\frac{B^2l^2v^2}{R}$ **(c)** $\frac{Bwv}{R}$ **(d)** $\frac{B^2w^2v^2}{R}$

40. A metal plate gets heated when cathode rays strike against it due to

(a) Kinetic energy of cathode rays

(b) Potential energy of cathode rays

(c) Linear velocity of cathode rays

(d) Angular velocity of cathode rays

41. Ampere hour is the unit of

(a) Quantity of charges **(b)** Potential **(c)** Energy

(d) Current

42. Huygen s conception of secondary waves

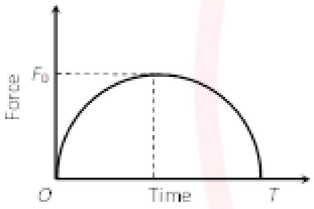
(a) Allow us to find the focal length of a thick lens

(b) Is a geometrical method to find a wavefront

(c) Is used to determine the velocity of light

(d) Is used to explain polarization

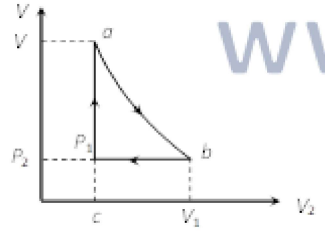
43. A particle of mass m , initially at rest, is acted upon by a variable force F for a brief interval of time T . It begins to move with a velocity u after the force stops acting. F is shown in the graph as a function of time. The curve is semicircle



(a) $u = \frac{\pi F_0^2}{2m}$ **(b)** $u = \frac{\pi T^2}{8m}$ **(c)** $u = \frac{\pi F_0 T}{4m}$

(d) $u = \frac{F_0 T}{2m}$

44. Carbone monoxide is carried around a closed cycle abc in which bc is an isothermal process as shown in the figure. The gas absorbs $7000\ J$ of heat as its temperature increases from $300\ K$ to $1000\ K$ in going from a to b . The quantity of heat rejected by the gas during the process ca is



(a) $4200\ J$ **(b)** $5000\ J$ **(c)** $9000\ J$ **(d)** $9800\ J$

45. A lens is made of flint glass (refractive index = 1.5). When the lens is immersed in a liquid of refractive index 1.25, the focal length

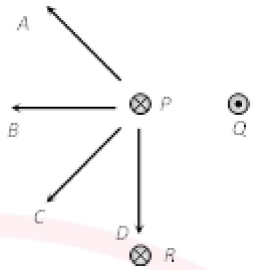
(a) Increase by a factor of 1.25

(b) Increases by a factor of 2.5

(c) Increases by a factor of 1.2

(d) Decreases by a factor of 1.2

46. The figure shows three long straight wires P, Q and R carrying currents normal to the plane of the paper. All three currents have the same magnitude. Which arrow best shows the direction of the resultant force on the wire P



(a) A **(b)** B **(c)** C **(d)** D

47. A bottle weighing 220 g and of area of cross-section 50 cm^2 and height 4 cm oscillates on the surface of water in vertical position. Its frequency of oscillation is

(a) 1.5 Hz **(b)** 2.5 Hz **(c)** 3.5 Hz **(d)** 4.5 Hz

48. According to corpuscular theory of light, the different colours of light are due to

(a) Different electromagnetic waves

(b) Different force of attraction among the corpuscles

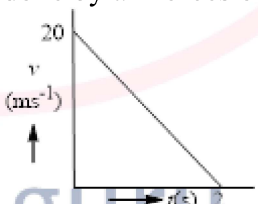
(c) Different size of the corpuscles

(d) None of the above

49. If error in radius is 3%, what is error in volume of sphere?

(a) 3% **(b)** 27% **(c)** 9% **(d)** 6%

50. Velocity-time graph of a particle of mass 2 kg moving in a straight line is as shown in figure. Work done by all forces on the particle is



(a) 400 J **(b)** −400 J **(c)** −200 J **(d)** 200 J

CHEMISTRY SECTION A

51. At lower temperatures, all gases except H_2 and He show

(a) Negative deviation **(b)** Positive deviation

(c) Positive and negative deviation

(d) None of the above

52. Chromium has most stable oxidation state of:

(a) +5 **(b)** +3 **(c)** +2 **(d)** +4

53. Solder is an alloy of :

(a) Pb, Sb and Sn **(b)** Pb and Sn **(c)** Pb, Bi and Sn

(d) Sn, Sb and Cu

54. Candles contain a mixture of:

(a) Bees wax and paraffin wax

(b) Bees wax and stearic acid

(c) Paraffin wax and stearic acid

(d) Higher fatty acids

55. 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

56. For the reaction, $C(s) + CO_2(g) \rightleftharpoons 2CO(g)$, the partial pressure of CO_2 and CO are 4 and 8 atm respectively, K_p for the reaction is :

(a) 16 atm **(b)** 2 atm **(c)** 5 atm **(d)** 4 atm

57. Glucose and fructose differ in:

(a) Taste **(b)** Action of heat

(c) Action of Tollens reagent

(d) Direction of optical rotation

58. Which of the following are not correct?

(a) Lone pair of electrons present on central atom can give rise to dipole moment

(b) Dipole moment is vector quantity

(c) CO_2 molecule has dipole moment

(d) Difference in electronegativities of combining atoms can lead to dipole moment

59. In OF_2, number of bond pairs and lone pairs of electrons are respectively:

(a) 2, 6 **(b)** 2, 8 **(c)** 2, 10 **(d)** 2, 9

60. Which of the following is the correct order of the rate of reaction of C_6H_6, C_6D_6, and C_6T_6 towards sulphonation?

(a) Same rates of reaction of C_6D_6, C_6D_6 and C_6T_6

(b) $C_6T_6 > C_6D_6 > C_6H_6$ **(c)** $C_6H_6 > C_6D_6 > C_6T_6$

(d) $C_6H_6 > C_6D_6 = C_6T_6$

61. The oxidation states of iodine in HIO_4, H_3IO_5 and H_5IO_6 are respectively

(a) +1,+3,+7 **(b)** +7,+7,+3 **(c)** +7,+7,+7

(d) +7,+5,+3

62. Which structure can be explained by taking ground state configuration of atom?

(a) BeH_2 **(b)** BF_3 **(c)** CH_4 **(d)** H_2O

63. Which of the following alkaline earth metal sulphates has hydration enthalpy higher than the lattice enthalpy? (2010)

(a) $CaSO_4$ **(b)** $BeSO_4$ **(c)** $BaSO_4$ **(d)** $SrSO_4$

64. Extraction of lead by reduction methods is done by

(a) Adding more galena into reverberatory furnace

(b) Adding more galena and coke into the reverberatory furnace

(c) Self reduction of oxide from sulphide present in the furnace

(d) Adding more lead sulphate into reverberatory furnace

65. Which of the following order is wrong? (2002)

(a) $NH_3 < PH_3 < AsH_3$ acidic

(b) Li $< Be < B < C - 1^{st}$ IP

(c) $Al_2O_3 < MgO < Na_2O < K_2O$ basic

(d) $Li^+ < Na^+ < K^+ < Cs^+$ ionic radius.

66. The differential rate law for the reaction, $4NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(g)$

(a) $-\frac{d[NH_3]}{dt} = -\frac{d[O_2]}{dt} = -\frac{d[NO]}{dt} = -\frac{d[H_2O]}{dt}$

(b) $\frac{d[NH_3]}{dt} = \frac{d[O_2]}{dt} = -\frac{1}{4}\frac{d[NO]}{dt} = -\frac{1}{6}\frac{d[H_2O]}{dt}$

(c) $\frac{1}{4}\frac{d[NH_3]}{dt} = \frac{1}{5}\frac{d[O_2]}{dt} = \frac{1}{4}\frac{d[NO]}{dt} = \frac{1}{6}\frac{d[H_2O]}{dt}$

(d) $-\frac{1}{4}\frac{d[NH_3]}{dt} = -\frac{1}{5}\frac{d[O_2]}{dt} = \frac{1}{4}\frac{d[NO]}{dt} = \frac{1}{6}\frac{d[H_2O]}{dt}$

67. Bauxite ore is made up of $Al_2O_3 + SiO_2 + TiO_2 + Fe_2O_3$. This ore is treated with conc. $NaOH$ solution at 500K and 35 bar pressure for few hours and filtered hot. In the filtrate the species present, are

(a) $NaAl(OH)_4$ only **(b)** $Na_2Ti(OH)_6$ only

(c) $NaAl(OH)_4$ and Na_2SiO_3 both **(d)** Na_2SiO_3 only

68. 1023. Most unstable hydride is

(a) NH_3 **(b)** PH_3 **(c)** AsH_3 **(d)** BiH_3

69. Which pair is not associated with complimentary colour

(a) Orange – blue **(b)** Yellow – purple

(c) Green – red **(d)** Red – yellow

70. Red lead in an example of a/an oxide

(a) Basic **(b)** Mixed **(c)** Super **(d)** Amphoteric

71. Which of the following is a hypnotic drug?

(a) Luminal **(b)** Salol **(c)** Catechol **(d)** Chemisol

72. Which functional group participates in disulphide bond formation in proteins?

(a) Thiolacetone **(b)** Thiol **(c)** Thioether

(d) Thioester

73. The formula of potash alum is

(a) $K_2SO_4.Al_2(SO_4)_3.24H_2O$

(b) $K_2SO_4.Al_2(SO_4)_3.18H_2O$

(c) $K_2SO_4.(NH_4)_2SO_4\,.\,18H_2O$

(d) $Na_2SO_4.Al_2(SO_4)_3.24H_2O$

74. Which of the following sulphates has the highest solubility?

(a) $BeSO_4$ **(b)** $MgSO_4$ **(c)** $BaSO_4$ **(d)** $CaSO_4$

75. Chemical reactions with very high E_a values are generally

(a) Very fast **(b)** Very slow **(c)** Moderately fast

(d) Spontaneous

76. Smelling salt is:

(a) $(NH_4)_2SO_4$ **(b)** $(NH_4)_3PO_4$ **(c)** NH_4Cl

(d) $(NH_4)_2CO_3$

77. The product obtained by heating diethyl ether with HI is

(a) C_2H_5I **(b)** C_2H_5OH **(c)** $C_2H_5OH + C_2H_5I$

(d) $C_2H_5 - C_2H_5$

78. Weight of an atom of an element is 6.644×10^{-23} g. What will be the number of g atom of that element in 40 kg?

(a) 10^3 **(b)** 10^6 **(c)** 1.5×10^3 **(d)** None of these

79. What is the two third life of a first order reaction having $= 5.48 \times 10^{-14} s^{-1}$?

(a) $2.01 \times 10^{11} s$ **(b)** $2.01 \times 10^{13} s$ **(c)** $8.08 \times 10^{13} s$

(d) $16.04 \times 10^{11} s$

80. Cortisone is a molecular substance containing 21 atoms of carbon per molecule. The molecular weight of cortisone is 360.4. what is the percentage of carbon in cortisone?

(a) 59.9% **(b)** 75% **(c)** 69.98% **(d)** None of these

81. Which gas is used in airated water?

(a) CO_2 **(b)** SO_2 **(c)** CO **(d)** Water vapours

82. $NaHC_2O_4$ is 0.1 M when neutralized with NaOH. Hence, it is --------- when oxidized with MnO_4^-/H^+

(a) 0.1 N **(b)** 0.2 N **(c)** 0.05 N **(d)** 0.15 N

83. The density of a gas A is twice that of a gas B at the same temperature. The molecular weight of gas B is thrice that of A . The ratio of the pressures acting on A and B will be

(a) $\frac{1}{6}$ **(b)** $\frac{7}{8}$ **(c)** $\frac{2}{5}$ **(d)** $\frac{1}{4}$

84. Fermentation of starch to give alcohol takes place in presence of :

(a) Enzymes **(b)** CO_2 **(c)** Air **(d)** N_2

85. Ethylene oxide when treated with Grignard reagent yields (2006)

(a) primary alcohol **(b)** secondary alcohol

(c) tertiary alcohol **(d)** cyclopropyl alcohol.

SECTION B (Solve Any 10)

86. In BrF_3 molecule, the lone pair occupy equatorial position to minimize :

(a) Lone pair-bond pair repulsion only

(b) Bond pair-found pair repulsion only

(c) Lone pair-lone pair repulsion and lone pair-bond pair repulsion

(d) Lone pair-lone pair repulsion only

87. The action of halogen acids on an ether, has the following order of reactivity:

(a) $HCl > HBr > HI$ **(b)** $HI > HCl > HBr$

(c) $HI > HBr > HCl$ **(d)** $HCl > HI > HBr$

88. Catalyst only

(a) Decreases activation energy

(b) Increases activation energy

(c) Bring about equilibrium **(d)** None of the above

89. Ammonium carbonate decomposes as For the reaction, $K_p = 2.9 \times 10^{-5}\ atm^3$. If we start with 1 mole of the compound, the total pressure at equilibrium would be

(a) 0.766 atm **(b)** 0.0582 atm **(c)** 0.0388 atm

(d) 0.0194 atm

90. The ionisation enthalpy of hydrogen atom is $1.312 \times 10^6 Jmol^{-1}$. The energy required to excite the electron in the atom from $n_1 = 1$ to $n_2 = 2$ is

(a) $8.51 \times 10^5\ J\ mol^{-1}$ **(b)** $6.56 \times 10^5\ J\ mol^{-1}$

(c) $7.56 \times 10^5\ J\ mol^{-1}$ **(d)** $9.84 \times 10^5\ J\ mol^{-1}$

91. Sulphanilic acid is a/an:

(a) Arrhenius acid **(b)** Lewis base

(c) Both (a) and (b) **(d)** Neither (a) nor (b)

92. Which transition involves maximum amount of energy?

(a) $M^-(g) \rightarrow M(g) + e$ **(b)** $M^-(g) \rightarrow M^+(g) + 2e$

(c) $M^+(g) \rightarrow M^{2+}(g) + e$ **(d)** $M^{2+}(g) \rightarrow M^{3+}(g) + e$

93. Bithional is added to soap as an additive to function as a/an

(a) Softener **(b)** Hardener **(c)** Dryer

(d) Antiseptic

94. Choose the arrangement which shows the increasing value of e/m for e, p, n and α -particles

(a) $n < \alpha < p < e$ **(b)** $e < p < \alpha < n$

(c) $n < p < e < \alpha$ **(d)** $p < n < \alpha < e$

95. Zinc sulphate contains 22.65% of zinc and 43.9% of water of crystallization. If the law of constant proportions is true then the weight of zinc required to produce 20 g of the crystals will be

(a) 45.3 g **(b)** 4.53 g **(c)** 0.453 g **(d)** 453 g

96. When phenyl magnesium bromide reacts with *t*-butanol, the product would be

(a) Benzene **(b)** Phenol **(c)** *t* -butyl benzene

(d) *t* -butyl phenyl ether

97. Mosley s name is connected with the discovery of :

(a) Protons **(b)** Neutrons **(c)** Atomic number

(d) Atomic weight

98. The basic structural unit is silicates is

(a) SiO_2 **(b)** $[Si_2O_7]^{2-}$ **(c)** SiO_4 tetrahedron

(d) $[Si_2O_5]^{2-}$

99. Which is used in the treatment of manic-depressive disorders?

(a) Na_2CO_3 **(b)** Li_2CO_3 **(c)** K_2CO_3 **(d)** $MgCO_3$

100. Which is valid at absolute zero?

(a) KE of the gas becomes zero, but molecular motion does not become zero

(b) KE of the molecules becomes zero and the molecular motion also becomes zero

(c) KE of the gas decreases but does not become zero

(d) None of the above

BIOLOGY I SECTION A

101. Which of the following does not belong to the class-Hexactinellida?

(a) *Hyalonema* **(b)** *Cliona* **(c)** *Euplectella*

(d) None of these

102. Which one of the following statements is correct? (2009)

(a) Benign tumours show the property of metastasis

(b) Heroin accelerates body functions

(c) Malignant tumours may exhibit metastasis

(d) Patients who have undergone surgery are given cannabinoids to relieve pain

103. The respiratory quotient (RQ) or respiratory ratio is

(a) $\text{RQ} = \frac{\text{Volume of } O_2 \text{ evolved}}{\text{Volume of } CO_2 \text{ consumed}}$

(b) $\text{RQ} = \frac{\text{Volume of } O_2 \text{ consumed}}{\text{Volume of } CO_2 \text{ evolved}}$

(c) $\text{RQ} = \frac{\text{Volume of } CO_2 \text{ consumed}}{\text{Volume of } O_2 \text{ evolved}}$

(d) $\text{RQ} = \frac{\text{Volume of } CO_2 \text{ evolved}}{\text{Volume of } O_2 \text{ consumed}}$

104. Chloroplasts, with pyrenoid like structures are found in the leaves of

(a) *Funaria* **(b)** *Cycas* **(c)** *Selaginella*

(d) *Zea mays*

105. The amphibians of plant kingdom are

(a) Multicellular non-motile algae

(b) Bryophytes with simple internal organization

(c) Unicellular motile algae

(d) Pteridophytes with complex internal organization

106. he articulation of vertebrae in vertebral column is when

(a) Post-zygapophyses of a vertebra in front fit beneath the pre-zygapophyses of the another vertebra behind

(b) Post-zygapophyses of a vertebra in front fit over the pre-zygapophyses of another vertebra behind

(c) Pre-zygapophyses of a vertebra fit over the post-zygapophyses of the vertebra in front

(d) Pre and post-zygapophyses of vertebra simply touch one another

107. The chemical reactions which liberate energy by enzymatic oxidation of food stuffs to CO_2 and H_2O, in the tissues are referred to as the

(a) Energy metabolism

(b) Respiratory metabolism **(c)** None of these

(d) Both (a) and (b)

108. Meiosis in *Dryopteris* takes place during

(a) Gamete formation **(b)** Spore germination

(c) Zygote formation **(d)** Spore formation

109. Cyclic phosphorylation occurs at which wavelength

(a) Wavelength beyond 800 nm

(b) Wavelength beyond 680 nm

(c) Wavelength below 680 nm

(d) Wavelength below 500 nm

110. Peroxy Acetyl Nitrate, a class of hazardous air pollutants, stems from I. O_2 II. SO_x III. NO_x IV. HC

(a) I and III **(b)** II and III **(c)** III and IV

(d) II and IV

111. If turgidity of a cell surrounded by water increases, the wall pressure will

(a) Increase **(b)** Decrease **(c)** Fluctuate

(d) Remain unchanged

112. Papillary muscles are found in mammalian

(a) Auricles **(b)** Ventricles **(c)** Pinna **(d)** Eyes

113. In which of the following techniques, the embryos are transferred to assist those females who cannot conceive? (NEET 2020)

(a) ZIFT and IUT **(b)** GIFT and ZIFT

(c) ICSI and ZIFT **(d)** GIFT and ICSI

114. I. Intra pulmonary pressure remains less than the atmospheric pressure II. There is negative pressure in the lungs than the atmospheric pressure In which of the above two situations inspiration takes place? Choose the correct option accordingly?

(a) Only I **(b)** Only II **(c)** Both I and II **(d)** I or II

115. Which of the following techniques serves the purpose of early diagnosis of AIDS, cancer, etc? I. Polymerase chain reaction II. Recombinant DNA technology III. Enzyme linked immune-sorbant assay Choose the correct option

(a) I and II **(b)** I and III **(c)** II and III

(d) I, II and III

116. How many pairs of cranial nerves originate from the brain of rabbit?

(a) 12 **(b)** 8 **(c)** 9 **(d)** 11

117. Identify the correctly matched pair. (2005)

(a) Basel convention Biodiversity conservation

(b) Kyoto protocol Climatic change

(c) Montreal protocol Global warming

(d) Ramsar convention Ground water pollution

118. One of the examples of the action of the autonomous nervous system is

(a) Knee-jerk response **(b)** Papillary reflex

(c) Swallowing of food

(d) Peristalsis of the intestines

119. Both in callus and suspension cultures commonly used auxin is

(a) Napthalene acetic acid

(b) Indole-3 butyric acid

(c) 2, 4, 5- trichlorophenoxy acetic acid

(d) Dichlorophenoxy acetic acid (2, 4,-D)

120. Hormones produce their effect on target tissue by binding to specific proteins called as

(a) Target proteins **(b)** Activator proteins

(c) Inhibitor proteins **(d)** Hormone receptors

121. Sperms in *Ascaris* are characterized by one unusual feature, *i.e.,*

(a) Long form **(b)** Lack of flagellum **(c)** Motility

(d) Ability to induce meiosis in egg

122. Term ecology was given by

(a) Reiter **(b)** Cuvier **(c)** Haeckel **(d)** Malthus

123. Dilatation of pupil takes place by

(a) Sympathetic nervous system

(b) Parasympathetic nervous system

(c) Central nervous system **(d)** Both a) and b)

124. is a book (taxonomic acid) which contain information about habitat, distribution, climate description and index of plant found in a particular area

(a) Manual **(b)** Flora **(c)** Monograph **(d)** Key

125. The transition zone between two communities is known as

(a) Ecotone **(b)** Keystone species **(c)** Edge effect

(d) Critical link species

126. Molybdenum is the essential constituent of

(a) Nitrogenase **(b)** Respiratory chain

(c) Growth regulators **(d)** Chlorophyll

127. In drumstick, the seeds are dispersed by

(a) Water **(b)** Animals **(c)** Wind

(d) Explosive mechanism

128. Which of the following disease is caused by bacteria *Salmonella typhi* ?

(a) Typhoid **(b)** Pneumonia **(c)** Malaria **(d)** Cold

129. Clotting disorders occur mainly due to the reduction in the number of

(a) Granulocytes **(b)** RBC **(c)** WBC **(d)** Platelets

130. Intercalary meristem is a derivative of

(a) Lateral meristem **(b)** Promeristem

(c) Primary meristem **(d)** Secondary meristem

131. Transfer of pollen grains from one flower to another flower of same plant is

(a) Geitonogamy **(b)** Autogamy **(c)** Allogamy

(d) Cleistogamy

132. Part of bile juice useful in digestion is

(a) Bile salt **(b)** Bile pigment **(c)** Bile matrix

(d) All of these

133. Number of cranial nerves in frog

(a) 10 pairs **(b)** 9 pairs **(c)** 12 pairs

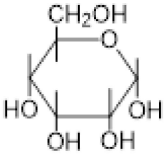
(d) None of these

134. The values of osmotic potential (π) and pressure potential (ρ) of cells A, B, C and D are given below. Cell π ρ A -1.0 0.5 B -0.6 0.3 C -1.2 0.6 D -0.8 0.4 Identify the correct sequence that shows the path of movement of water from among the following.

(a) $D \rightarrow C \rightarrow A \rightarrow B$ **(b)** $B \rightarrow D \rightarrow A \rightarrow C$

(c) $B \rightarrow C \rightarrow D \rightarrow A$ **(d)** $C \rightarrow B \rightarrow A \rightarrow D$

135. The below structural formula belongs to



(a) Ribose **(b)** Glucose **(c)** Sucrose

(d) Deoxyribose

SECTION B (Solve Any 10)

136. As compared to the dicot root, monocotyledon root have

(a) More xylem bundles **(b)** More phloem bundles

(c) Less phloem bundles **(d)** Less xylem bundles

137. Cohension and adhension theory, is otherwise called

(a) Relay pump theory **(b)** Pulsation theory

(c) Root pressure theory

(d) Transpiration pull theory

138. elvic girdle of rabbit consist of

(a) Ilium, ischium & pubis

(b) Ilium, ishcium & coracoid

(c) Coracoid, scapula & clavicle

(d) Ilium, coracoid & scapula

139. Julius Von Sachs, who demonstrated hydroponics for the first time, was a German

(a) Zoologist **(b)** Mathematician **(c)** Botanist

(d) Physicist

140. Meselson and Stahl experiment on semi-conservative replication demonstrates

(a) 60% radioactive, 50% non-radioactive

(b) 50% non-radioactive **(c)** 50% radioactive

(d) None of the above

141. Drinking of mineral water with very low level of pesticides (about 0.02 ppm) for long periods may

(a) Produce immunity against mosquito

(b) Cause leukaemia (blood cancer) in most people

(c) Cause cancer of the intestine

(d) Lead to accumulation of pesticide residues in body fat

142. The rate of which organic compounds are formed in a green plant or in a population of green plants per unit time and area is known as the

(a) Net primary productivity

(b) Gross primary productivity

(c) Community productivity

(d) Secondary productivity

143. Respiratory substrate are the organic substance which are .. during respiration to liberate energy

(a) Oxidised **(b)** Reduced **(c)** Both (a) and (b)

(d) Synthesised

144. G-6-P dehydrogenase deficiency is associated with haemolysis of

(a) Lymphocytes **(b)** RBCs **(c)** Platelets

(d) Leucocytes

145. Which of the following is not used for disinfection of drinking water?

(a) Phenyl **(b)** Chloramines **(c)** Chlorine

(d) Ozone

146. The function of a vessel is conduction of

(a) Food **(b)** Water and minerals **(c)** Hormones

(d) All of these

147. Genotype is the

(a) Genetic constitution

(b) Genetic constitution of the phenotype

(c) Trait expressed **(d)** Expressed genes

148. Centromere is required for (2005)

(a) movement of chromosomes towards poles

(b) cytoplasmic cleavage **(c)** crossing over

(d) transcription

149. Chemotaxonomy is connected with

(a) Classification of chemicals found in plants

(b) Use of phytochemical data in systematic botany

(c) Application of chemicals on herbarium sheets

(d) Use of statistical methods in chemical yielding pl

150. ACTH is secreted by

(a) Thyroid gland **(b)** Thymus gland

(c) Pituitary gland **(d)** Islets of Langerhans

BIOLOGY II SECTION A

151. A somatic cell that has just completed the S phase of its cell cycle, as compared to gamete of the same species, has (2015cancelled)

(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 but twice the amount of DNA

152. Which of the following is not an organ of central nervous system?

(a) Brain **(b)** Cranial nerves **(c)** Spinal cord

(d) None of these

153. The vital morphological and physiological units of mammalian kidney are

(a) Ureters **(b)** Uriniferous tubule **(c)** Nephridia

(d) Seminiferous tubules

154. The thickening of walls of arteries is called (1999)

(a) arteriosclerosis **(b)** arthritis **(c)** aneurysm

(d) both (b) and (c)

155. PEPcase has an advantage over RuBisCo. The advantage is

(a) RuBisCo combines with O_2 but PEPcase do not

(b) RuBisCo combines with NO_2 but PEPcase do not

(c) RuBisCo conserve energy but PEPcase do not

(d) PEPcase is present in both mesophyll cells and bundle sheath cells but RuBisCo is not

156.

Gland	Secretion	Function
A	Estrogen	Secondary sexual character
α-cells of Langerhans	*B*	Increases blood sugar level
Anterior lobe of pituitary	*C*	Over secretion leads to gigantism

A B C

(a) Ovary Glucagon GH **(b)** GH Glucagon PRL

(c) GH Glucagon MSH **(d)** Ovary Glucagon MSH

157. In case of Marchantia, antheridiophore is produced by:

(a) Female thallus **(b)** Male thallus

(c) Monoecious plant **(d)** None of above

158. Which one of the following is not a part of a renal pyramid? (Mains 2011)

(a) Peritubular capillaries **(b)** Convoluted tubules

(c) Collecting ducts **(d)** Loop of Henle

159. Protoplasts of two different species are used in

(a) Micro-propagation **(b)** Somatic hybridization

(c) Clonal propagation **(d)** Organography

160. The Leydig s cells secrete

(a) Oestrogen **(b)** Testosterone **(c)** Progesterone

(d) Corticosterone

161. New varieties of plants can be produced by:

(a) Selection and hybridization

(b) Subjecting them to very heavy dose of radiation

(c) Subjecting them to doses of radiation and selection

(d) Subjecting them to continuous radiation

162. In bundle, sheath cells are the large cells around the

(a) Vascular bundles of C_4 -plants

(b) Vascular bundles C_3 -plants

(c) Vascular bundles of C_2 -plants

(d) All of the above

163. The book Genera Plantarum was written by (1999)

(a) Engler and Prantl **(b)** Bentham and Hooker

(c) Bessey **(d)** Hutchinson

164. The poisonous fluid present in nematocyst of *Hydra* is

(a) Venom **(b)** Haematin **(c)** Toxin

(d) Hypnotoxin

165. Parenchymatous cells are usually present in the I. pericycle II. pith III. medullary rays IV. primary root V. secondary root VI. primary stem VII. secondary stem Select the correct combinations from the given options

(a) All except I and III **(b)** All except V and VII

(c) All except II and IV **(d)** All except VI and III

166. Which of the following is an inexhaustible resource?

(a) Fossil fuel **(b)** Solar energy **(c)** Coal

(d) Petroleum

167. Every 100 mL of deoxygenated blood delivers approximately?

(a) 3 mL of CO_2 **(b)** 2 mL of CO_2 **(c)** 4 mL of CO_2

(d) 1 mL of CO_2

168. Endosperm is the result of

(a) Single fertilisation **(b)** Partial fertilisation

(c) Double fertilisation **(d)** Triple fertilisation

169. Which of the following is not true about sclereids ? (1996)

(a) These are groups of living cells

(b) These are found in nut shells, guava pulp, pear

(c) These are also called stone cells

(d) These are form of sclerenchyma with fibres

170. Most thickly populated country is:

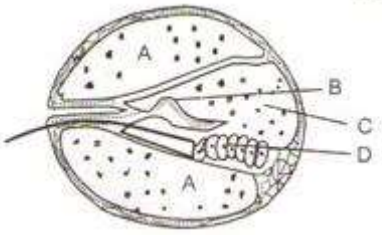
(a) Bangladesh **(b)** Australia **(c)** U.S.A **(d)** India

171. In which of the following aestivation of sepal s/petals one margin covers the other and its margin is covered by previous one?

(a) Valvate **(b)** Twisted **(c)** Imbricate

(d) Quincuncial

172. Given below is a diagrammatic cross-section of a single loop of human cochlea.



Which one of the following options correctly represents the name of three different parts?

(a) A-Tectorial membrane B-Perilymph C-Secretory cells D-Endolymph

(b) A-Endolymph B-Sensory hair cells C-Serum D-Tectorial membrane

(c) A-Sensory hair cells B-Endolymph C-Tectorial membrane D-Perilymph

(d) A-Perilymph B-Tectorial membrane C-Endolymph D-Organ of Corti

173. During Kreb s cycle of A NADH, B ATP is produced through ETS in mitochondria. Choose, the correct pair from the option given below

(a) A-2 B-4 **(b)** A-4 B-2 **(c)** A-6, B-18

(d) A-2 B-8

174. Total number of bones in each limb of a man is (1998)

(a) 24 **(b)** 30 **(c)** 14 **(d)** 21

175. Bicollateral vascular bundles are found in the members of this family

(a) Malvaceae **(b)** Fabaceae **(c)** Caesalpiniaceae

(d) Cucurbitaceae

176. Which among the following is the real product of honey bee?

(a) Pollen **(b)** Bee wax **(c)** Honey **(d)** Propolis

177. The total number of lobes and alveoli present in both the lungs of man are

(a) 17 and 30 million, respectively

(b) 5 and 300 million, respectively

(c) 19 and 300 million, respectively

(d) 18 and 300 lakh, respectively

178. Turpentine oil is obtained from

(a) *Pinus longifolia* **(b)** *Melia azadirachta*

(c) *Eucalyptus* **(d)** All of these

179. Name the fungus that helps in N_2 -fixation

(a) *Rhizopus* **(b)** *Albugo* **(c)** *Puccinia*

(d) *Pullularia*

180. Flagellated male gametes are present in all the three of which one of the following sets? (*2007*)

(a) *Zygnema*, *Saprolegnia* and *Hydrilla*

(b) *Fucus*, *Marsilea* and *Calotropis*

(c) *Riccia*, *Dryopteris* and *Cycas*

(d) *Anthoceros*, *Funaria* and *Spirogyra*

181. The ozone layer is found in

(a) Troposphere **(b)** Mesosphere **(c)** Stratosphere

(d) Atmosphere

182. One of the *ex situ* conservation method for endangered species is

(a) Wildlife sanctuaries **(b)** Biosphere reserves

(c) Cryopreservation **(d)** National parks

183. To isolate protoplast, one needs

(a) Pectinase **(b)** Cellulase **(c)** Both (a) and (b)

(d) Chitinase

184. A bicollateral vascular bundle has the following arrangement of tissues.

(a) Outer phloem → Outer xylem → Middle cambium → Inner xylem → Inner phloem

(b) Outer cambium → Outer phloem → Middle xylem → Inner phloem → Inner cambium

(c) Outer phloem → Outer cambium → Middle xylem → Inner cambium → Inner phloem

(d) Outer xylem → Outer cambium → Middle phloem → Inner cambium → Inner xylem

185. Sertoli cells are found in (2010)

(a) ovaries and secrete progesterone

(b) adrenal cortex and secrete adrenaline

(c) seminiferous tubules and provide nutrition to germ cells

(d) pancreas and secrete cholecystokinin

SECTION B (Solve Any 10)

186. Systematic botany means

(a) System analysis

(b) Systematic arrangement of organs of plants

(c) Systematic study of organelles and tissues

(d) Methodical study of plants, dealing with identification, naming and classificartion

187. Select the wrong statement

(a) Proteins are heteropolymers made of amino acids

(b) Ribozymes are nucleic acids with catalytic power

(c) Nucleic acids serve as genetic material

(d) Collagen is the most abundant protein in the whole of the biosphere and Rubisco is the most abundant proteins in animal world

188. Cause of mimicry is (2002)

(a) concealment **(b)** offence **(c)** defence

(d) both (b) and (c)

189. First hormone prepared by genetic engineering is:

(a) Insulin **(b)** Oxytocin **(c)** Adrenaline

(d) Somatotropin

190. Select the wrong statements. (I) Lower the taxon, more are the characteristics that the member within the taxon share. (II) Order is the assemblage of genera which exhibit a few similar characters. (III) Cat and dog are included in the same family-Felidae. (Iv) Binomial nomenclature was introduced by Carolus Linnaeus.

(a) I, II and III **(b)** II, III and IV **(c)** I and IV

(d) II and III

191. If we remove half of the forest cover of earth, the crisis that will occur

(a) Many species would become extinct

(b) Population, pollution and ecological imbalance will rise

(c) Energy crisis will commence

(d) The remaining forest will correct the imbalance

192. Trisomy of which chromosome is involved in Down s syndrome?

(a) 15^{th} **(b)** 21^{st} **(c)** 20^{th} **(d)** 19^{th}

193. Probability of genotype TTrr in F_2 - generation of a dihybrid cross is

(a) $\frac{1}{16}$ **(b)** $\frac{3}{16}$ **(c)** $\frac{9}{16}$ **(d)** $\frac{6}{16}$

194. Sound box of birds is called (1992)

(a) pygostyle **(b)** larynx **(c)** syrinx **(d)** synsacrum.

195. Choose the wrong statements I. Two species may not live in same habitat II. The more dissimilar the niches of two species the stronger is their competition III. Two species can occupy the same niche in geographical area IV. No two species may occupy the same ecosystem The correct option is

(a) I, II and III **(b)** II, III and IV

(c) I, II, III and IV **(d)** III and IV

196. The number of pairs of cranial nerves arising from the brain of frog is

(a) 10 **(b)** 9 **(c)** 8 **(d)** 7

197. The products of decomposition process are

(a) Humus **(b)** Inorganic nutrients

(c) Organic nutrients **(d)** Both (a) and (b)

198. Select the correctly written scientific name of Mango which was first described by Carolus Linnaeus. (NEET 2019)

(a) Mangifera Indica

(b) Mangifera indica Car. Linn

(c) Mangifera indica Linn **(d)** Mangifera indica

199. Which of the following is main negative mineral ion in extracellular fluid?

(a) SO_4^{2-} **(b)** Cl^- **(c)** NO_2^- **(d)** OH^-

200. Biochemical Oxygen Demand (BOD) in a river water

(a) Remains unchanged when algal bloom occurs

(b) Has no relationship with concentration of oxygen in the water

(c) Gives a measure of *Salmonella* in the water

(d) Increase when sewage gets mixed with river water