

Sample Questions for

ASAT

(ALLEN Scholarship Admission Test)

CLASSROOM CONTACT PROGRAMME

ENTHUSIAST COURSE

(FOR XI to XII MOVING STUDENTS)

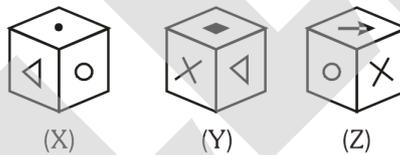


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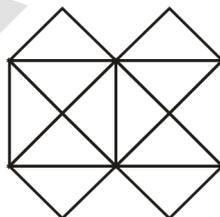
MENTAL ABILITY

- Deepak is brother of Ravi. Reena is sister of Atul. Ravi is son of Reena. How is Deepak related to Reena?
 (1) Son (2) Brother (3) Nephew (4) Father
- A cube is coloured red on three adjacent faces. It is then cut (once horizontally and once vertically) into four cuboids of equal size. Each of these cuboids is coloured green on all the uncoloured faces and is again cut (once horizontally and once vertically) into four cuboids of equal size. How many cuboids have three red faces each?
 (1) 1 (2) 2 (3) 4 (4) 8
- If O = 16, FOR = 42, then what is FRONT equal to?
 (1) 61 (2) 65 (3) 73 (4) 78
- If the day before yesterday was Thursday, when will Sunday be?
 (1) Today (2) Two days after today
 (3) Tomorrow (4) Day after tomorrow
- A cube has six different symbols drawn over its six faces. The symbols are dot, circle, triangle, square, cross and arrow. Three different positions of the cube are shown in figures X, Y and Z.



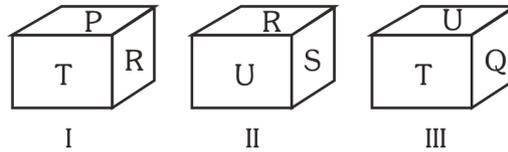
Which symbol is opposite the dot?

- Count the number of triangles in the given figure.



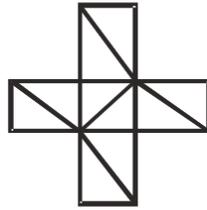
- Count the number of triangles in the given figure.
 (1) 12 (2) 20 (3) 22 (4) 24
- A man leaves for his office from this house. He walks towards East. After moving a distance of 20m, he turns South and walks 10 m. Then he walks 35 m towards the West and further 5m towards the North. He then turns towards East and walks 15 m. What is the straight distance (in metres) between his initial and final positions?
 (1) 0 m (2) 5 m
 (3) 10 m (4) None of these

8. How many times do the two hands of a clock coincide in a 24 hour day?
 (1) 24 (2) 20 (3) 12 (4) 22
9. From the given three positions of a single dice, find the letter at the face opposite to the face having letter Q.



- (1) P
 (2) R
 (3) S
 (4) T
10. In a certain code language, STRING is written as % = *-\$ ÷ and PRAISE as ?*@-%×. How will the word GRAPES be written in that code language?
 (1) ÷*@×?% (2) ÷@*?×%
 (3) ÷*@?×% (4) ÷*-?×%
11. In the given question one number is wrong in the series, find out the wrong number.
 225, 289, 338, 374, 397, 415, 424
 (1) 289 (2) 338
 (3) 374 (4) 397
12. Study the given information carefully and answer the question that follow :
 (i) A, B, C, D, E, F and G are sitting on a wall and all of them are facing east.
 (ii) C is on the immediate right of D.
 (iii) B is at an extreme end and has E as his neighbour.
 (iv) G is between E and F.
 (v) D is sitting third from the south end.
 Immediately between which of the following pairs of people is D sitting :
 (1) AC (2) AF
 (3) CE (4) CF
13. Read the following information and answer the question.
 1. P + Q means 'P is the mother of Q'.
 2. P ÷ Q means 'P is the father of Q'.
 3. P - Q means 'P is the sister of Q'.
 Which of the following represents "M is the daughter of R" ?
 (1) R ÷ M + N (2) R + N ÷ M
 (3) R - M ÷ N (4) Data inadequate

26. How many triangles are there in the following figure.



- (1) 11 (2) 14 (3) 16 (4) 7

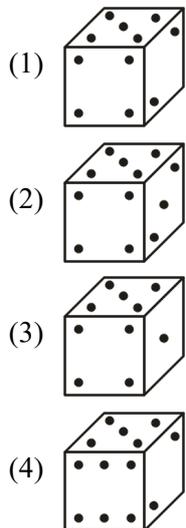
27. The time on the watch is quarter to three. If the minute hand points of North-East, in which direction does the hour hand point ?

- (1) North-West
 (2) South-West
 (3) South-East
 (4) North-East

28. Find the angle between the two hands of a clock at 15 minutes past 4 O'clock :

- (1) 38.5°
 (2) 36.5°
 (3) 37.5°
 (4) None of these

29. If the total of dots on opposite faces of a cubical block is always 7, find the figure which is correct:



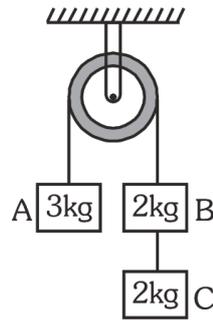
30. In a certain code **nee tim see** means **how are you**; **ble nee see** means **where are you**. What is the code for **where** ?

- (1) nee (2) tim
 (3) see (4) ble

PHYSICS

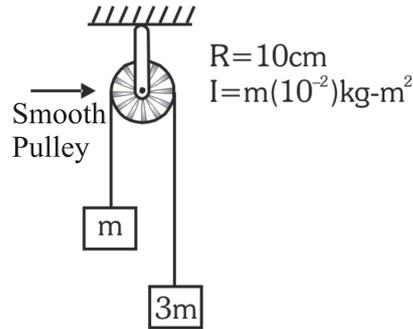
31. Which of the following dimensions will be the same as that of time –
- (1) LC (2) $\frac{R}{L}$ (3) $\frac{L}{R}$ (4) $\frac{C}{L}$
32. Assuming that the mass m of the largest stone that can be moved by a flowing river depends upon the velocity v of the water, its density ρ and the acceleration due to gravity g . Then m is directly proportional to–
- (1) v^3 (2) v^4 (3) v^5 (4) v^6
33. Suppose refractive index μ is given as : $\mu = A + \frac{B}{\lambda^2}$. Where A and B are constants and λ is the wavelength, then dimensions of B is same as that of–
- (1) Wavelength (2) Volume (3) Pressure (4) Area
34. A particle starting from rest has a velocity that increases with displacement as i.e. $v = 2\sqrt{x}$. Then the velocity is
- (1) proportional to t (2) proportional to t^2
 (3) proportional to \sqrt{t} (4) constant
35. A 150 m long train is moving with a uniform velocity of 45 km/h. The time taken by the train to cross a bridge of length 850 meters is–
- (1) 56 sec (2) 68 sec (3) 80 sec (4) 92 sec
36. A ball of mass 1 kg is thrown vertically up another ball of mass 2 kg is thrown at angle $\theta = 45^\circ$. Both of them remain in air for same time period. The ratio of height attained by them is –
- (1) 2 : 1 (2) 1 : 2
 (3) 1 : $\cos \theta$ (4) 1 : 1
37. If $|\vec{A} \times \vec{B}| = 4$ and $|\vec{A} \cdot \vec{B}| = 3$ find the value of $|\vec{A} + \vec{B}|$
- (1) $\sqrt{A^2 + B^2 + \frac{8AB}{5}}$ (2) $\sqrt{A^2 + B^2 + \frac{6AB}{5}}$
 (3) $\sqrt{A^2 + B^2 - \frac{8AB}{5}}$ (4) $\sqrt{A^2 + B^2 - \frac{6AB}{5}}$
38. A rocket consumes fuel at the rate of 100 kg/s. The exhaust gases are ejected at a speed of 5×10^4 m/s relative to rocket. Neglecting the effect of gravity, the thrust experienced by the rocket is–
- (1) 5×10^2 N (2) 5×10^4 N
 (3) 5×10^6 N (4) 50 N
39. With what minimum acceleration, can a fireman slide down a rope whose breaking strength is two-third of his weight?
- (1) $\frac{2}{3}g$ (2) $\frac{g}{3}$ (3) g (4) zero

40. In the arrangement shown in figure the tension in the string connected between B and C is:



- (1) $g/7$ (2) $6g/7$ (3) $12g/7$ (4) $24g/7$
41. If a force of 250 N acts on a body, the momentum acquired is 125 kg-m/s. What is the period for which force acts on the body
- (1) 0.2 s (2) 0.5 s (3) 125×250 s (4) 0.25 s
42. 300 J of work is done in sliding a 2 kg block slowly up an inclined plane of height 10 m. Taking $g = 10 \text{ m/s}^2$, work done against friction is :-
- (1) 200 J (2) 100 J (3) Zero (4) 1000 J
43. If the kinetic energy of a body is double of its initial kinetic energy, then the final momentum of the body will be
- (1) $2\sqrt{2}$ times (2) $\sqrt{2}$ times (3) $\frac{1}{\sqrt{2}}$ times (4) none of these
44. The power of a pump, which can pump 500 kg of water to height 100 m in 10 s is
- (1) 75 kW (2) 25 kW (3) 50 kW (4) 500 kW
45. A particle moves along x-axis from $x = 0$ to $x = 5$ metre under the influence of a force $F = 7 - 2x + 3x^2$. The work done (in joule) in the process is-
- (1) 70 (2) 135 (3) 270 (4) 35
46. A spring of force constant k is first stretched by distance a from its natural length and then further by distance b . The work done in stretching the part b is-
- (1) $\frac{3}{2}ka(a - b)$ (2) $\frac{1}{2}ka(a + b)$
 (3) $\frac{1}{2}ka(a - b)$ (4) $\frac{1}{2}kb(2a + b)$
47. A spring with spring constants k when compressed by 1cm, the potential energy stored is U . If it is further compressed by 3 cm, then change in its potential energy is-
- (1) $3U$ (2) $9U$ (3) $8U$ (4) $15U$
48. A force $F = (3x\hat{i} + 4\hat{j})$ Newton (where x is in metres) acts on a particle which moves from a position (2m, 3m) to (3m, 0m). Then the work done is
- (1) 7.5J (2) -12J (3) -4.5 J (4) +4.5 J

49. Find acceleration of blocks

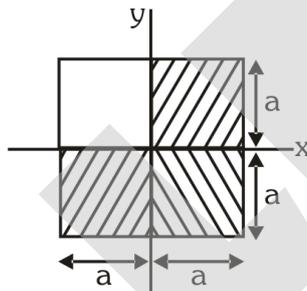


- (1) $\frac{g}{3}$ (2) $\frac{g}{2}$ (3) $\frac{g}{4}$ (4) $\frac{2g}{3}$

50. If linear density of a rod of length 3m varies as $\ell = 2 + x$ and one end of rod is at origin then the position of the centre of gravity of the rod from origin is :

- (1) $\frac{7}{3}$ m (2) $\frac{12}{7}$ m (3) $\frac{10}{7}$ m (4) $\frac{9}{7}$ m

51. One fourth part of a square plate of uniform density is cut and removed as shown in figure. Find the centre of mass of remaining plate—



- (1) $\left(\frac{-a}{6}, \frac{-a}{6}\right)$ (2) $\left(\frac{a}{6}, \frac{-a}{3}\right)$
 (3) $\left(\frac{a}{3}, \frac{-a}{3}\right)$ (4) $\left(\frac{a}{6}, \frac{-a}{6}\right)$

52. By applying a constant torque a wheel is turned 2 revolution in 8 sec. The angular velocity of wheel after 10 sec from start. (rad/sec)

- (1) $\frac{4}{5}\pi$ (2) 2π (3) $\frac{5}{4}\pi$ (4) $\frac{5}{8}\pi$

53. A system consists of two identical particles. One particle is at rest and the other particle has an acceleration a. The centre of mass of the system has an acceleration of—

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

54. Two drops of water which are falling in air are having mass ratio 1 : 27, what will be ratio of their terminal speed—
- (1) 1 : 9
(2) 1 : 4
(3) 1 : 3
(4) 3 : 1
55. Water is flowing with a velocity of 2 m/s in a horizontal pipe with cross-sectional area decreasing from $2 \times 10^{-2} \text{ m}^2$ to 0.01 m^2 at pressure 4×10^4 pascal. The pressure at smaller cross-section in pascal will be—
- (1) 32
(2) 3.4
(3) 3.4×10^4
(4) 3.4×10^5
56. A rectangular container with base $5 \text{ cm} \times 10 \text{ cm}$ contains 5 kg of water. What is the pressure exerted by water at the bottom of the container—
- (1) 1 atm
(2) 10^4 Pa
(3) 490 N/m^2
(4) 900 Pa
57. Bernoulli's theorem is based on the law of conservation of—
- (1) Mass
(2) Energy
(3) Momentum
(4) None of these
58. In uniform circular motion which of the following quantity is constant ?
- (1) Acceleration
(2) Velocity
(3) Speed
(4) None of these
59. In uniform circular motion which of the following quantity is not constant ?
- (1) Speed
(2) Magnitude of acceleration
(3) Velocity
(4) None of these
60. Direction of small angular displacement is same as that of
- (1) Angular acceleration
(2) Angular velocity
(3) Velocity
(4) None of these

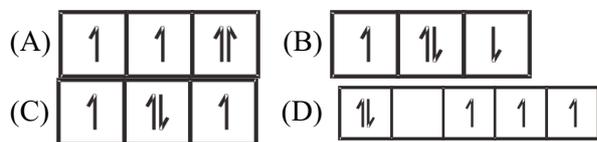
CHEMISTRY

61. 56 g of red hot iron is treated with 36 mL water. The weight of Fe_3O_4 produced would be (Fe = 56)
- (1) 77.33 g (2) 11.6 g (3) 232 g (4) 58 g
62. Maximum number of spectral lines in infrared region when electrons of a sample of hydrogen atom in 5th excited state return to their ground state—
- (1) 15 (2) 9 (3) 6 (4) 10
63. Which of the following is the correct order of size of the given species :
- (1) $\text{Cl} > \text{Cl}^- > \text{Cl}^+$ (2) $\text{Cl}^+ > \text{Cl}^- > \text{Cl}$
 (3) $\text{Cl} > \text{Cl}^+ > \text{Cl}^-$ (4) $\text{Cl}^- > \text{Cl} > \text{Cl}^+$
64. Which of the following molecule contains $p\pi - p\pi$ & $p\pi - d\pi$ bond.
- (1) SO_2 (2) SO_3 (3) $\text{H}_4\text{P}_2\text{O}_7$ (4) All of these
65. Equilibrium : $2\text{SO}_3(\text{g}) \rightarrow 2\text{SO}_2(\text{g}) + \text{O}_2(\text{g})$ is not affected by
- (1) Temperature change (2) Pressure change
 (3) Volume change (4) Addition of inert gas at constant T & V
66. pH of 0.1M NaA solution is : Given : $(K_b)_{A^-} = 10^{-9}$
- (1) 5 (2) 11 (3) 9 (4) 8
67. If three unreactive gases having partial pressure P_A , P_B and P_C and their moles are 4, 2 and 3 respectively then their total pressure will be :-
- (1) $P = P_A + P_B + P_C$ (2) $P = \frac{P_A + P_B + P_C}{6}$
 (3) $P = \frac{\sqrt{P_A + P_B + P_C}}{3}$ (4) None of these
68. Highly pure dilute solution of sodium in liquid ammonia:
- (i) shows blue colour. (ii) exhibits electrical conductivity.
 (iii) produces sodium amide. (iv) produces hydrogen gas.
- (1) (i), (ii), (iii) (2) (i), (ii) (3) (i), (iii) (4) (i), (ii), (iv)
69. Which of the following has largest number of atoms ?
- (1) 1 g Au (2) 1 g Na (3) 1 g Li (4) 1 g Cl_2
70. Select incorrect statements for isoelectronic species—
- (i) They have same number of electrons.
 (ii) They always have same electronic configuration
 (iii) They give same spectral lines
 (iv) They have same effective nuclear charge
- (1) (i) and (iv) (2) (ii) and (iv)
 (3) (ii), (iii) and (iv) (4) (iii) and (iv)

71. Electronic configurations of four elements A, B, C and D are given below :
 (A) $1s^2 2s^2 2p^6$ (B) $1s^2 2s^2 2p^4$ (C) $1s^2 2s^2 2p^6 3s^1$ (D) $1s^2 2s^2 2p^5$
 Which of the following is the correct order of increasing tendency to ionization energy:
- (1) $A < C < B < D$ (2) $A < B < C < D$
 (3) $C < B < D < A$ (4) $D < A < B < C$
72. Which of the following are paramagnetic in nature?
- (1) H_2, N_2 and C_2 (2) O_2, B_2, O_2^- (3) O_2^-, N_2^+, H_2 (4) B_2, C_2 and F_2
73. Which of the following salt is hydrolysed?
- (1) CH_3COONa (2) KNO_3 (3) $NaCl$ (4) K_2SO_4
74. Equilibrium constant for the reaction :
 $2NO(g) + Cl_2(g) \rightleftharpoons 2NOCl(g)$
 is correctly given by expression
- (1) $K = \frac{[2NOCl]}{[2NO][Cl_2]}$ (2) $K = \frac{[NOCl]^2}{[NO]^2[Cl_2]}$
 (3) $K = \frac{[NO]^2[Cl_2]^2}{[NO]^2 + [Cl_2]}$ (4) $K = \frac{[NO]^2 + [Cl]^2}{[NOCl]}$
75. Gas equation $PV = nRT$ is obeyed by
- (1) only isothermal process (2) only adiabatic process
 (3) Both (1) and (2) (4) None of these
76. Which of the following alkali metals burns in air to form a monoxide?
- (1) Na (2) Li (3) K (4) Cs
77. How many grams of bromine will react with 21 grams of C_3H_6 ?
- (1) 320 (2) 240 (3) 160 (4) 80
78. Choose the correct sequence of size of the elements of 13th group.
- (1) $B < Al < Ga < In < Tl$ (2) $B < Ga < Al < In < Tl$
 (3) $B > Al > Ga > In > Tl$ (4) $B < Ga < Al < Tl < In$
79. Which of the following molecules has highest dipole moment ?
- (1) BF_3 (2) NH_3 (3) NF_3 (4) B_2H_6
80. A gas diffuse $1/3$ times as fast as hydrogen. Its molecular weight is
- (1) 9 (2) 18 (3) 3 (4) $3\sqrt{2}$
81. Which of the following has the highest solubility product?
- (1) KOH (2) CsOH (3) LiOH (4) RbOH

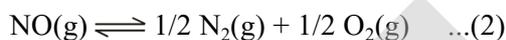
82. Molarity of KOH solution, prepared by dissolving 5.6 g in water to form 250 ml solution, will be—
 (1) 0.1 M (2) 0.4 M (3) 0.2 M (4) 1.0 M

83. The portion of orbital diagrams representing the electronic configuration of certain elements shown below. Which of them violate Pauli's Exclusion principle?



- (1) Only A (2) Only C (3) B and D (4) A, B and D
84. Correct order of atomic radius is—
 (1) $V > Ti$ (2) $Cl > S$ (3) $Rb > Cs$ (4) $Ne > Be$
85. Correct order of bond angle is :-
 (1) $OF_2 < H_2O < NH_3 < Cl_2O$ (2) $OF_2 < NH_3 < Cl_2O < H_2O$
 (3) $OF_2 < Cl_2O < H_2O < NH_3$ (4) $Cl_2O < OF_2 < H_2O < NH_3$
86. Dominance of strong repulsive forces among the molecules of the gas (Z = compressibility factor)
 (1) Depends on Z and indicated by $Z = 1$ (2) Depends on Z and indicated by $Z > 1$
 (3) Depends on Z and indicated by $Z < 1$ (4) is independent of Z

87. K_1 and K_2 are equilibrium constant for reactions (1) and (2)



Then,

- (1) $K_1 = \left(\frac{1}{K_2}\right)^2$ (2) $K_1 = K_2^2$
 (3) $K_1 = \frac{1}{K_2}$ (4) $K_1 = (K_2)^\circ$

88. The correct expression for Ostwald's dilution law is

- (1) $K_a = \frac{\alpha}{V}$ (2) $K_a = \alpha^2 \times V$
 (3) $K_a = \frac{\alpha^2}{(1 - \alpha)V}$ (4) $K_a = \frac{\alpha^2}{(1 - \alpha)C}$

89. Hydrogen gas produced by heating NaOH with which metal :-

- (1) Ag (2) Cu (3) Zn (4) Au

90. Most stable carbocation among following is—



MATHEMATICS

91. If sum of the coefficient of the first, second and third terms of the expansion of $\left(x^2 + \frac{1}{x}\right)^m$, $m \in \mathbb{N}$ is 46, then the coefficient of the term that does not contain x is :
- (1) 84 (2) 92 (3) 98 (4) 106
92. In a triangle ABC (with usual notations), if ex-radii r_1, r_2, r_3 are in H.P., then $\frac{a+c}{b}$ is :
- (1) 1 (2) 2 (3) 3 (4) 4
93. If $(a + ib)^5 = \alpha + i\beta$ then $(b + ia)^5$ is equal to :
- (1) $\beta - i\alpha$ (2) $\beta + i\alpha$ (3) $\alpha - \beta$ (4) $-\alpha - i\beta$
94. The orthocentre of the triangle formed by the lines $xy = 0$ and $x + y = 1$ is :
- (1) $\left(\frac{1}{2}, \frac{1}{2}\right)$ (2) $\left(\frac{1}{3}, \frac{1}{3}\right)$ (3) $(0, 0)$ (4) $\left(\frac{1}{4}, \frac{1}{4}\right)$
95. If straight line $y = 2x + k$ cuts the circle $4x^2 + 4y^2 - 4x - 8y - 15 = 0$ exactly two real distinct points, then number of integral values of k are :
- (1) 11 (2) 10 (3) 9 (4) 8
96. If $\sin x = \cos^2 x$, then $\cos^2 x (1 + \cos^2 x)$ equals to :
- (1) 0 (2) 1 (3) 2 (4) none of these
97. Let $i = \sqrt{-1}$ then complex number $\left(\frac{1}{1+i} - \frac{1}{2+i}\right) \left(\frac{4-3i}{1+3i}\right)$ equals :
- (1) $-\frac{1}{2}$ (2) $\frac{1}{2}$ (3) $\frac{i}{2}$ (4) $-\frac{i}{2}$
98. The sum of an infinitely decreasing G.P. is 4 and the sum of cubes of its terms is equal to $\frac{64}{7}$. The ratio of its 5th to 7th term is :
- (1) 2 (2) 3 (3) 4 (4) 5
99. Coefficient of t^{12} in $(1+t^2)^6(1+t^6)(1+t^{12})$ is -
- (1) 24 (2) 21 (3) 22 (4) 23
100. The sum of first n terms of series $1.4 + 3.7 + 5.10 + \dots$ is :
- (1) $\frac{n^2(n+1)^2}{4}$ (2) $\frac{n^2(4n^2+5n-1)}{2}$
 (3) $\frac{n(4n^2+5n-1)}{2}$ (4) $\frac{4n^2+5n-1}{2}$
101. The value of sum $\sum_{r=1}^{10} (2^{r-1} + 8r - 3)$ is equal to :
- (1) 1343 (2) 1234 (3) 1334 (4) 1433

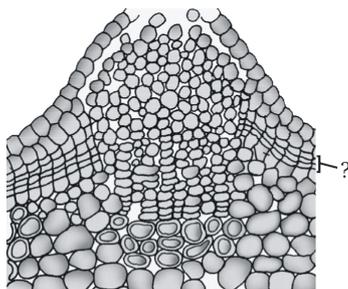
102. If $e^{i\theta} = \cos \theta + i \sin \theta$, then for the ΔABC , $e^{iA} \cdot e^{iB} \cdot e^{iC}$ is equal to :
- (1) $-i$ (2) 1 (3) -1 (4) none of these
103. If α, β ($\alpha < \beta$), are the roots of the equation, $x^2 + bx + c = 0$, where $c < 0 < b$, then :
- (1) $0 < \alpha < \beta$ (2) $\alpha < 0 < \beta < |\alpha|$
 (3) $\alpha < \beta < 0$ (4) $\alpha < 0 < |\alpha| < \beta$
104. The least integral value of p for which $2x^2 - 4x + p + 5 > 0$ for all $x \in \mathbb{R}$, is :
- (1) -3 (2) -2 (3) -1 (4) 0
105. Let a circle $C_1 \equiv x^2 + y^2 - 4x + 6y + 1 = 0$ and circle C_2 is such that its centre is image of centre of C_1 about x -axis and radius of C_2 is equal to radius of C_1 , then area of C_1 which is not common with C_2 is :
- (1) $10\pi + 3\sqrt{3}$ (2) 10π (3) $8\pi - 6\sqrt{3}$ (4) $8\pi + 6\sqrt{3}$
106. a, b, c are the sides of a triangle ABC which is right angled at C , then the minimum value of $\left(\frac{c}{a} + \frac{c}{b}\right)^2$ is :
- (1) 0 (2) 4 (3) 6 (4) 8
107. If the lines represented by $2x^2 + 8xy + ky^2 = 0$ are coincident, then the values of k is :
- (1) 8 (2) -8 (3) 4 (4) -4
108. If $y = \frac{x^2 + 2x - 11}{x - 3}$, $x \in \mathbb{R}$ then Range of y is—
- (1) $\mathbb{R} - (-12, -4)$ (2) $(-\infty, 2) \cup (12, \infty)$
 (3) $(-\infty, 4] \cup [12, \infty)$ (4) $(-\infty, -4] \cup [4, \infty)$
109. If $|x + 2| < 4$. Then x is :
- (1) $(-6, 2)$ (2) $(-6, 0)$ (3) $(-6, 2]$ (4) $(0, 2)$
110. The value of $\frac{\cos^3 10^\circ + \sin^3 20^\circ}{\cos 10^\circ + \sin 20^\circ}$ is equal to :
- (1) $\frac{1}{2}$ (2) $\frac{3}{4}$ (3) $\frac{2}{3}$ (4) $\frac{1}{4}$
111. $\sum_{r=1}^n r \left(\frac{{}^n C_r}{{}^n C_{r-1}} \right)$ is equal to -
- (1) $\sum_{r=1}^n r^2$ (2) $\sum_{r=1}^n r$ (3) $\sum_{r=1}^n r(r+1)$ (4) $\sum_{r=1}^n r^3$
112. If in a ΔABC , $\angle C = 90^\circ$, then the maximum value of $\sin A \sin B$ is :
- (1) $\frac{1}{2}$ (2) 1
 (3) 2 (4) None of these

113. The number of complex numbers 'z' satisfying $|z-3-i|=|z-9-i|$ and $|z-3+3i|=3$ are :
- (1) 1 (2) 2
(3) 4 (4) None of these
114. In ΔABC , $y = x$ is internal angle bisector of angle B and equation of side AC is $2x - y = 2$. If coordinates of A are (4, 6) and $2AB = BC$, then coordinates of B are :
- (1) (4, 4) (2) (14, 14) (3) $\left(\frac{14}{9}, \frac{14}{9}\right)$ (4) $\left(\frac{4}{9}, \frac{4}{9}\right)$
115. From points (3, 4), chords are drawn to the circle $x^2 + y^2 - 4x = 0$. The locus of the midpoints of the chords is :
- (1) $x^2 + y^2 - 5x - 4y + 6 = 0$
(2) $x^2 + y^2 + 5x - 4y + 6 = 0$
(3) $x^2 + y^2 - 5x + 4y + 6 = 0$
(4) $x^2 + y^2 - 5x - 4y - 6 = 0$
116. If $\frac{3\pi}{4} < \alpha < \pi$, then $\sqrt{2 \cot \alpha + \frac{1}{\sin^2 \alpha}}$ is equal to :
- (1) $1 + \cot \alpha$
(2) $-1 - \cot \alpha$
(3) $1 - \cot \alpha$
(4) $-1 + \cot \alpha$
117. Let w is non real cube root of unity then the $(3 + 5w + 3w^2)^2 + (3 + 3w + 5w^2)^2$ is
- (1) -4 (2) 4
(3) 0 (4) 2
118. Let g_n be the n^{th} term of the geometric progression of positive numbers. $g_2 + g_4 + g_6 + \dots + g_{200} = \frac{10}{3}$ and $g_1 + g_3 + g_5 + \dots + g_{199} = \frac{5}{9}$ then the common ratio of geometric progression, is :
- (1) 2 (2) 4 (3) 6 (4) 8
119. The sum of last eight consecutive coefficients in the expansion of $(1+x)^{15}$ is :-
- (1) 2^{15} (2) 2^{14}
(3) 2^{16} (4) 2^8
120. Let S_n denote the sum of the first n terms of an A.P. where $S_n = 3n^2 + 5n$ then common difference A.P. is :
- (1) 3 (2) 4
(3) 6 (4) 8

BIOLOGY

121. Which one is incorrect statement
- (1) Only human have self consciousness
 - (2) Consciousness is the defining property of living organisms
 - (3) Metabolic reaction can not demonstrated in-vitro (in-cell-free-system)
 - (4) Metabolism is the combination of Catabolism & Anabolism.
122. The largest, most general group in the classifications used by biologists is the
- (1) Kingdom
 - (2) Class
 - (3) Order
 - (4) Species
123. Double fertilization is found in–
- (1) Angiosperms
 - (2) Gymnosperms
 - (3) Pteridophytes
 - (4) Bryophytes
124. Heterospory is universal feature of–
- (1) Algae
 - (2) Bryophyte
 - (3) Pteridophyte
 - (4) All seeded plant
125. Endosperm of gymnosperms and angiosperms show ploidy–
- (1) $2n, 2n$
 - (2) $3n, n$
 - (3) n, n
 - (4) $n, 3n$
126. Variation in length of the filament of stamen can be seen in–
- (1) Salvia
 - (2) Mustard
 - (3) Chinarse
 - (4) Both (1) and (2)
127. How many given plants have adventitious root–
Maize, Carrot, Sugarcane, Onion
- (1) 1
 - (2) 2
 - (3) 4
 - (4) 3
128. Exarch and polyarch vascular bundles occur in
- (1) Monocot stem
 - (2) Monocot root
 - (3) Dicot stem
 - (4) Dicot root
129. Phloem parenchyma is absent in
- (1) Dicot stem
 - (2) Monocot stem
 - (3) Dicot root
 - (4) Dicot leaf

130. What is asked in the following diagram



- (1) Lenticel (2) Periderm
(3) Phellogen (4) Vascular cambium

131. A multinucleate cell is called

- (1) Coenobium (2) Thallus (3) Synchronium (4) Coenocyte

132. Enzymes of electron transport system are located in

- (1) Matrix of mitochondria (2) Outer membrane of mitochondria
(3) Inner membrane of mitochondria (4) Stroma of chloroplast

133. On which concentration of Mg^{+2} ions dimmer of ribosome formed

- (1) 0.0001 M (2) 0.001 M (3) 0.01 M (4) 0.10 M

134. Meiosis occurs in

- (1) Haploid individuals (2) Diploid individuals
(3) Both (1) and (2) (4) In bacteria only

135. Spindle apparatus is formed during which stage of mitosis

- (1) Prophase (2) Metaphase (3) Anaphase (4) Telophase

136. Lasso cells are found in—

- (1) Ctenophora (2) Cnidaria
(3) Flatworms (4) Segmented worms

137. Kala-Azar is caused by—

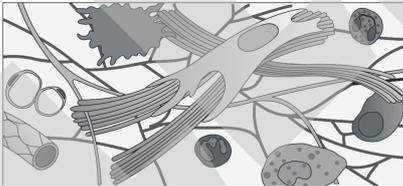
- (1) *Plasmodium vivax* (2) *Trypanosoma gambiense*
(3) *Trypanosoma cruzi* (4) *Leishmania donovani*

138. Slipper animalcule is—

- (1) Paramecium (2) Amoeba (3) Euglena (4) Vorticella

139. Wheel organ which helps in the ingestion of food is found in—

- (1) Myxine (2) Ascidia
(3) Balanoglossus (4) Amphioxus

140. Flame cells are present for excretion in–
 (1) Hemichordata (2) Urochordata (3) Cephalochordata (4) Tunicata
141. Ammocoete larva is found during the development of–
 (1) Petromyzon (2) Myxine
 (3) Amphioxus (4) Both (1) and (2)
142. Origin of epithelial tissue is–
 (1) Ectodermal (2) Mesodermal
 (3) Endodermal (4) All of the above
143. Ciliated columnar epithelium present in–
 (1) Fallopian tube (2) Some bronchiole lining
 (3) Both (1) and (2) (4) Bronchi
144. Which of the following is an example of unicellular gland–
 (1) Goblet cells (2) Paneth cells (3) Both (1) and (2) (4) Sweat gland
145. Which of the following is not a feature of skeletal muscle ?
 (1) Striations (2) Voluntary control
 (3) Non-fatigue nature (4) Both (1) and (2)
146. 
- The above diagram is related to–
 (1) Areolar tissue (2) Dense regular connective tissue
 (3) Dense irregular connective tissue (4) Epithelial tissue
147. Cockroach is–
 (1) Nocturnal – omnivorous (2) Diurnal – omnivorous
 (3) Nocturnal – carnivorous (4) Diurnal – carnivorous
148. The protein which enables glucose transport into cells is–
 (1) Collagen (2) Trypsin (3) Insulin (4) GLUT-4
149. Which one is not a aromatic amino acid ?
 (1) Tyrosine (2) Tryptophan (3) Phenylalanine (4) Cysteine
150. Enzymes usually–
 (1) Increases activation energy (2) Decreases activation energy
 (3) Can't changes activation energy (4) Always increases activation energy

