RAVI TEST PAPERS & NOTES , WHATSAPP - 8056206308

NEET PRACTICE TEST 6 SEPTEMBER

JOIN MY PAID WHATSAPP GROUP WITH ANSWERS FEES RS.3000 FROM SEP 2025 TO MAY 2026

1. A new system of units is proposed in which unit of mass is α kg, unit of length is β m and unit of time is γs. What will be value of 5 J in this new system?
   a) $5\alpha\beta^2\gamma^{-2}$ b) $5\alpha^{-1}\beta^{-2}\gamma^2$ c) $5\alpha^{-2}\beta^2\gamma^{-2}$ d) $5\alpha^{-1}\beta^2\gamma^2$
2. If C and R denote capacitance and resistance respectively, then the dimensional formula of CR is _____
   a) $\left[\mathrm{M^0\ L^0\ T}\right]$ b) $\left[\mathrm{M^0\ L^0\ T^0}\right]$ c) $\left[\mathrm{M^0\ L^0\ T^{-1}}\right]$ d) Not expressible in terms of [MLT]
3. The values of two resistors are R_1= (6 ± 0.3)$k\Omega$ and R_2 = (10 ± 0.2)$k\Omega$. The percentage error in the equivalent resistance when they are connected in parallel is :
   a) 5.125% b) 2% c) 3.125% d) 7% e) 10.125%
4. The dimensional formula for permeability of free space μ_o is _____
   a) $\left[\mathrm{MLT^{-2}\ A^{-2}}\right]$ b) $\left[\mathrm{ML^{-1}\ T^2\ A^{-2}}\right]$ c) $\left[\mathrm{ML^{-1}\ T^2\ A^2}\right]$ d) $\left[\mathrm{MLT^{-2}\ A^{-1}}\right]$
5. Dimensional formula of a physical quantity x is $[M^{-1} L^3 T^{-2}]$. The errors in measuring the quantities M, L and T respectively are 2%, 3% and 4%. The maximum percentage of error that occurs in measuring the quantity x is:
   a) 14% b) 19% c) 9% d) 10%
6. If area (A), velocity (υ) and density (ρ) are taken as fundamental units, what is the dimensional formula for force?
   a) $\left[A\upsilon^2\rho\right]$ b) $\left[A^2\upsilon\rho\right]$ c) $\left[A\upsilon\rho^2\right]$ d) $\left[A\upsilon\rho\right]$
7. The unit of Stefan-Boltzmann 's constant (σ) is:
   a) $\frac{watt^4}{m\times K^4}$ b) $\frac{calorie}{m^2\times K^4}$ c) $\frac{watt}{m^2\times K^4}$ d) $\frac{joule}{m^2\times K^4}$
8. Which of the following is not represented in correct unit :
   a) $\frac{Stress}{Strain}$ = N/m^2 b) Surface tension = N/m c) Energy = kg-m^2 /s^2 d) Pressure =N/m^2
9. **Assertion**: The elastic spring force arises due to the net attraction or repulsion between the neighbouring atoms of the spring when it is elongated or compressed.
   Reason: The laws of derived forces such as spring force, friction force are independent of the laws of fundamental forces in nature.
   a) If both assertion and reason are true and reason is the correct explanation of assertion.
   b) If both assertion and reason are true but reason is not the correct explanation of assertion.
   c) If assertion is true but reason is false. d) If both assertion and reason are false.
10. Generation, propagation and detection of electromagnetic waves is the basis of
    a) lasers b) reactors c) radio and television d) computer
11. A cube has numerically equal volume and surface area. The volume of such a cube is:
    a) 216 units b) 1000 units c) 2000 units d) 3000 units
12. The solid angle subtended by the periphery of an area 1 cm^{-2} at a point situated symmetrically at a distance of 5 cm from the area is :
    a) 2 x 10^{-2} steradian b) 4 x 10^{-2} steradian c) 6 x 10^{-2} steradian d) 8 x 10^{-2} steradian
13. Which of the following pairs of physical quantities have same dimensions?
    a) Force and power b) Torque and energy c) Torque and powder d) Force and torque

14. The dimensions of a rectangle are measured with a scale of least count 1 mm. The length is measured as l = 12.20 cm and the breadth is measured as 16.00 cm, The area with uncertainity is :
a) (195.2 ± 1.0) cm^2 b) (195.5 ± 1.0) cm^2 c) (195.0 ± 1.5) cm^2 d) (195.5± 1.5) cm^2

15. Who discovered the principle of inertia?
a) Newton b) Galileo c) Tycho Brahe d) Kepler

16. When a body moves with a constant speed along a circle:
a) No work is done on it b) No acceleration is produced in the body c) No force acts on the body
d) Its velocity remains constant

17. Which of the following quantities is dependent of the choice of orientation of the coordinate axes?
a) $\vec{A} + \vec{B}$ b) A_x+B_y c) $\left|\vec{A} + \vec{B}\right|$ d) Angle between $\vec{A}$ and $\vec{B}$

18. Which of the following does not depend on the choice of the co-ordinate system?
a) $\vec{P} + \vec{Q} + \vec{R}$ b) $(P_x + Q_x + R_x)\hat{i}$ c) $P_x\hat{i} + Q_y\hat{j} + R_z\hat{k}$ d) None of these

19. Which one of the following is not a derived unit?
a) joule b) watt c) kilogram d) newton

20. A rocket travelling at the speed of 500 metre per second ejects its products of combustion at the speed of 1500 metre per second relative to the rocket. Then the speed of escaping vapours with respect to the person on the ground is :
a) 500 metre per sec b) 1000 metre per sec c) 1500 metre per sec d) 2000 metre per sec

21. Which one of the following statements is incorrect?
a) Direct and indirect methods are used for the measurement of physical quantities.
b) Scientific notation and the prefixes are used to simplify numerical computation.
c) A dimensionally correct equation need not be a correct equation.
d) The SI units is based on six base units.

22. The order of magnitude of the diameter of the earth is (Diameter of the earth is 1.28 x 10^7m)
a) 5 b) 6 c) 7 d) 8

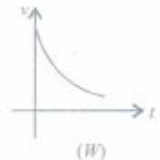
23. A particle moves with uniform velocity. Which of the following statements about the motion of the particle is true?
a) Its speed is zero. b) Its acceleration is zero. c) Its acceleration is opposite to the velocity.
d) Its speed may be variable.

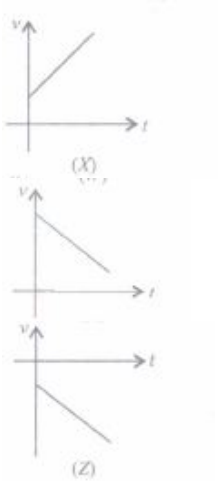
24. A ball is dropped from a high rise platform at t=0 starting from rest. After 6 seconds another ball is thrown downwards from the same platform with a speed v. The two balls meet at t=18s. What is the value of v? ($g=10m/s^2$)
a) 75 m/s b) 55 m/s c) 40 m/s d) 60 m/s

25. A ball A is dropped from a building of height 45 m. Simultaneously another identical ball B is thrown up with a speed 50 m s^{-1}. The relative speed of ball B w.r.t. ball A at any instant of time is (Take g = 10m s^{-2})
a) 0 b) 10 m s^{-1} c) 25 m s^{-1} d) 50 m s^{-1}

26. Four particles are fired with the same velocities at angles 20° ,40° ,55° and 70° with the horizontal. The range of projectile will be the largest for the one projected at angle:
a) 25° b) 40° c) 55° d) 70°

27. Given below are four curves describing variation of velocity with time of a particle. Which one of these describe the motion of a particle initially in positive direction with constant negative acceleration?





a) (W) b) (X) c) (Y) d) (Z)

28. A dimensionless quantity
    a) never has a unit b) always has unit c) may have a unit d) does not exit
29. If unit vectors $\hat{A}$ and $\hat{B}$ are inclined at an angle θ then I$\hat{A}$-$\hat{B}$ I is
    a) 2sin$\frac{\theta}{2}$ b) 2cos$\frac{\theta}{2}$ c) 2tan$\frac{\theta}{2}$ d) tanθ
30. Resultant of four non-coplanar non-zero vectors $\vec{a}, \vec{b}, \vec{c}$ and $\vec{d}$:
    a) always lies in the plane containing $\vec{a} + \vec{b}$ b) always lies in the plane containing $\vec{a} - \vec{b}$ c) can be zero
    d) cannot be zero
31. In an elevator moving vertically up with an acceleration 'g', the force exerted on the floor by a passenger of mass M is :
    a) Mg b) $\left(\frac{1}{2}\right)$Mg c) zero d) 2Mg
32. Sand is being dropped on a conveyor belt at the rate of M kg/s. The force necessary to keep the belt moving with a constant velocity of v m/s will be _____
    a) Mv newton b) 2 Mv newton c) $\frac{Mv}{2}$ newton d) zero
33. A cylinder rolls down an inclined plane of inclination 30°, the acceleration of cylinder is:
    a) g/3 b) g c) g/2 d) 2g/3
34. A book is lying on the table. What is the angle between the action of the book on the table and the reaction of the table on the book?
    a) 0° b) 45° c) 90° d) 180°
35. A ball is travelling with uniform translatory motion. This means that
    a) it is at rest b) the path can be a straight line or circular and the ball travels with uniform speed
    c) all parts of the ball have the same velocity (magnitude and direction) and the velocity is constant
    d) the centre of the ball moves with constant velocity and the ball spins about its centre uniformly
36. (A) Newton's first and second laws hold good in an inertial frame only.
    (R) Newton's third law holds good in all frames.
    a) If both assertion and reason are true and reason is the correct explanation of assertion.
    b) If both assertion and reason are true but reason is not the correct explanation of assertion.
    c) If assertion is true but reason is false. d) If both assertion and reason are false.
    e) If assertion is false but reason is true
37. A stone of mass 1 kg tied to a light inextensible string of length L=$\frac{10}{3}m$ is whirling in a circular path of radius L in a vertical plane. If the ratio of the maximum to the minimum tension in the string is 4 and g = 10 m/s^2, the speed of the stone at the highest point of the circle is:
    a) 20 m/s b) 10√3 m/s c) 5√2 m/s d) 10 m/s
38. A person of mass M is pulling a box of mass m on a horizontal rough surface. The force applied by him is horizontal. The coefficient of friction between the shoes of the man and the floor is f.land that between the box and the floor is u'. In which of the cases given ahead will he certainly fail to slide the box?
    a) M > m,$\mu > \mu'$ b) M < m,$\mu > \mu'$ c) M > m.$\mu < \mu'$ d) M < m,$\mu < \mu'$

39. Angular momentum L and rotational kinetic energy K_R of a rigid body are related to each other by the relation. (I = moment of inertia)
a) K_R =2IL b) $K_R = \frac{L^2}{2I}$ c) $K_R = \frac{2I}{L}$ d) $K_R \frac{L^2}{I}$

40. A rocket of mass 6000 kg is set for vertical firing. If the exhaust speed be 1 km/s, how much gas must be ejected to give the rocket an upward acceleration of 20 m s^{-2}? (Take g = 10 ms^{-2})
a) 45 kg/s b) 90 kh/s c) 120 kg/s d) 180 kg/s

41. Two spheres of equal masses, one of which is a thin spherical shell and the other a solid, have the same moment of inertia about their respective diameters. The ratio of their radii will be:
a) 5 : 7 b) 3 : 5 c) $\sqrt{3} : \sqrt{5}$ d) $\sqrt{3} : \sqrt{7}$

42. A body of mass m slides down a rough plane of inclination α if μ is the coefficient offriction, then acceleration of the body will be:
a) g sin α b) μ cos a c) g (sin α - μ cos α) d) g (cos α - μ sin α)

43. Which of the following statements is incorrect?
a) A cricketer moves his hands backwards while holding a catch
b)
A person falling from a certain height receives more injuries when he falls on a cemented floor than when he falls on a heap of sand.
c) It is easier to push a lawn mower than to pull it.
d) Mountain roads are generally made winding upwards rather than going straight up.

44. A convey or belt is moving at a constant speed of 2m/s' A box is gently dropped on it. The coefficient of friction between them is m: 0.5. The distance that the box will move relative to belt before coming to rest on it taking g = 10 ms 2, is _____
a) 12m b) 0.6m c) zero d) 0.4m

45. A body is under the action of two equal and oppositely directed forces and the body is rotating with constant acceleration. Which of the following cannot be the separation between the lines of action of the forces?
a) 1 m b) 0.4 m c) 0.25 m d) Zero

46. Abody of mass 3 kg is under a constant force which causes a displacement s in meters in it, given by the relation s=$\frac{1}{3}t^2$, where t is in seconds. Work done by the force in 2 seconds is :
a) $\frac{3}{8}J$ b) $\frac{8}{3}J$ c) $\frac{19}{5}J$ d) $\frac{5}{19}J$

47. Two bodies of masses 0.1 kg and 0.4 kg move towards each other with the velocities 1 m/s and 0.1 m/s respectively. After collision they stick together. In 10 see the combined mass travels:
a) 120 m b) 0.12 m c) 12 m d) 1.2 m

48. A particle with total energy E is moving in a potential energy region U(x). Motion of the particle is restricted to the region when _____
a) $U(x) > E$ b) $U(x) < E$ c) U(x) = 0 d) $U(x) \leq E$

49. bullet of mass 10 g moving horizontally with a velocity of 400 m s^{-1} strikes of wooden block of mass 2 kg which is suspended by a light inextensible string of length 5m. As aresult the centre of gravity of the block is found to rise a vertical distance of 10 cm. The speed of the bullet after it emerges out horizontally from the block will be
a) 160 m s^{-1} b) 100 m s^{-1} c) 80 m s^{-1} d) 120 m s^{-1}

50. One man takes 1 minute to raise a box to a height of 1 metre and another man takes 1/2 minute to do so. The energy of the two is
a) different b) same c) energy of the first is more d) energy of the second is more

51. A body of mass M is dropped from a height h on a sand floor. If the body penetrates x em into the sand, the average resistance offered by the sand to the body is:
a) $Mg\left(\frac{h}{x}\right)$ b) $Mg\left(1+\frac{h}{x}\right)$ c) Mgh + Mgx d) $Mg\left(1-\frac{h}{x}\right)$

52. A mass m moving horizontally (along the x-axis) with velocity y collides and sticks to mass of 3m moving vertically upward (along they-axis) with velocity 2v. Thi final velocity of the combination is _____
a) $\frac{1}{4}v\hat{i} + \frac{3}{2}v\hat{j}$ b) $\frac{1}{3}v\hat{i} + \frac{2}{3}v\hat{j}$ c) $\frac{2}{3}v\hat{i} + \frac{1}{3}v\hat{j}$ d) $\frac{3}{2}v\hat{i} + \frac{1}{4}v\hat{j}$

53. A ball loses 15.0% of its kinetic energy when it bounces back from a concrete wall. With what speed you must throw it vertically down from a height of 12.4 m to have it bounce back to the same height? (ignore air resistance)
a) 6.55 m/s b) 12.0 m/s c) 8.6 m/s d) 4.55 m/s

54. Monochromatic radiation emitted when electron on hydrogcn atom jumps from first excited to the ground state irradiates a photosensitive material. The stopping potential is measured to be 3.57 V. The threshold frequency of the materials is _____ .
a) 4×10^{15} Hz b) 5×10^{15}Hz c) 1.6×10^{15}Hz d) 2.5×10^{15}Hz

55. A uniform force of $(3\hat{i}+\hat{j})$ newton acts on a particle of mass 2 kg. Hence the particle is displaced from position $(2\hat{i}+\hat{k})$ metre to position $(4\hat{i}+3\hat{j}-\hat{k})$ metre. The work done by the force on the particle is:
a) 6 J b) 13 J c) 15 J d) 9 J

56. A body of mass 2 kg moving with a velocity of 6 m/s strikes inelastically another body of same mass at rest. The amount of heat evolved during collision is:
a) 36 J b) 18 J c) 9 J d) 3 J

57. Water is falling on the blades of a turbine from a height of 25 m. 3 x 10^3 kg of water pours on the blade per minute. If the whole of energy is transferred to the turbine, power delivered is:
a) 12250 W b) 16250 W c) 8250 W d) 20250 W

58. A body of mass m collides against a wall with a velocity v and rebounds with the same speed. Its change of momentum is
a) $2mv$ b) mv c) $-mv$ d) zero

59. In the question 161, the maximum positive displacement x IS:
a) $2\sqrt{3}m$ b) 2m c) 4m d) $\sqrt{2}m$

60. A weightlifter lifts a weight off the ground and holds it up
a) work is done in lifting as well as holding the weight b) no work is done in both lifting and holding the weight
c) work is done in lifting the weight but no work is required to done in holding it up
d) no work is done in lifting the weight but work is required to be done in holding it up

61. The acceleration ofa body due to the attraction of the earth (radius R) at a distance 2R from the surface of the earth is: (g = acceleration due to gravity at the surface of the earth)
a) g/9 b) g/3 c) g/4 d) g

62. A particle of mass 1 kg is placed at a distance of 4 m from the centre and on the axis of a uniform ring of mass 5 kg and radius 3m. Calculate the work required to be done to increase the distance of the particle from 4 m to 3 $\sqrt{3}$ m.
a) $\frac{5G}{6}J$ b) $\frac{G}{6}J$ c) $\frac{3G}{2}J$ d) $\frac{2G}{3}J$

63. The escape speed of a body on the earth's surface is 112 km s^{-1}. A body is projected with thrice of this speed. The speed of the body when it escapes the gravitational pull of earth is
a) 11.2 km s^{-1} b) $22.4\sqrt{2}$ km s^{-1} c) $\frac{22.4}{\sqrt{2}}$ km s^{-1} d) $22.4\sqrt{3}$ km s^{-1}

64. Different points in earth are at slightly different distances from the sun and hence experience different forces due to gravitation. For a rigid body, we know that if various forces act at various points in it, the resultant motion is as if a net force acts on the centre of mass causing translation and a net torque at the centre of mass causing rotation around an axis through the centre of mass. For the earth sun system (approximating the earth as a uniform density sphere)
a) the torque is zero b) the torque causes the earth to spin.
c) the rigid body result is not applicable since the earth is not even approximately a rigid body.
d) the torque causesthe earth to movearound the sun

65. A particle of mass m is situated at the centre of spherical shell of mass M and radius. The magnitude of the gravitational potential at a point situated at a/2 distance from the centre will be____
a) $\frac{2GM}{a}$ b) $\frac{3GM}{a}$ c) $\frac{4GM}{a}$ d) $\frac{GM}{a}$

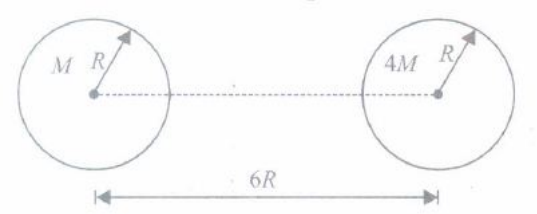
66. (A) If an earth satellite moves to a lower orbit there is some dissipation of energy but the satellite speed increases.
(R) The speed of satellite is a constant quantity.

a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false
e) If assertion is false but reason is true.

67. An iron ball and a wooden ball of the same radius are released from a height 'h' in vacuum. The time taken by both of them to reach the ground is :
a) Unequal b) Exactly equal c) Roughly equal d) Zero

68. How much work per kilogram need to be done to shift a 1 kg mass from the surface of the earth to infinity? (Take acceleration due to gravity = g and radius of the earth = R)
a) g/R b) R/g c) gR d) g/R^2

69. Two uniform solid spheres of equal radii R, but mass M and 4M have a centre to centre separation 6R, as shown in figure. A projectile of mass m is projected from the surface of the sphere of mass M directly towards the centre of the second sphere. The minimum speed of the projectile so that it reaches the surface of the second sphere is



a) $\sqrt{\frac{4}{5}\frac{GM}{R}}$ b) $\sqrt{\frac{5}{4}\frac{GM}{R}}$ c) $\sqrt{\frac{3}{5}\frac{GM}{R}}$ d) $\sqrt{\frac{5}{3}\frac{GM}{R}}$

70. Let A be area swept out by the line joining the earth and the sun during Feb. 1991. The area swept out by the line during a typical week in Feb. 1991 is:
a) A b) 2A c) 4A d) $\frac{A}{4}$

71. In the question number 51, the potential at the centre is
a) $-2\frac{Gm}{l}$ b) $-3\sqrt{2}\frac{Gm}{l}$ c) $-2\sqrt{2}\frac{Gm}{l}$ d) $-4\sqrt{2}\frac{Gm}{l}$

72. A projectile is fired vertically upwards from the surface of earth with a velocity of kv_e where ve is the escape velocity and k < 1. Neglecting air resistance, the maximum height to which it will rise, measured from the centre of the earth, is (R_E = radius earth)
a) $\frac{R_E}{1-k^2}$ b) $\frac{R_E}{k^2}$ c) $\frac{1-k^2}{R_E}$ d) $\frac{k^2}{R_E}$

73. The time period of an earth satellite in circular orbit is independent of:
a) the mass of the satellite b) radius of its orbit c) both the mass of satellite and radius of the orbit
d) neither the mass of satellite nor the radius of its orbit

74. A rod of length 3 m and its mass acting per unit length is directly proportional to distance x from its one end. The centre of gravity of the rod from that end will be at:
a) 1.5 m b) 2 m c) 2.5 m d) 3.0 m

75. A satellite A of mass m is at a distance r from the surface of the carth. Another satellite B of mass 2 m is at a distance of 2 r from the earth's surface. Their time periods are in the ratio of____
a) 1: 2 b) 1: 16 c) 1: 32 d) $1 : 2\sqrt{2}$

76. The direction of the angular velocity vector is along
a) the tangent to the circular path b) the inward radius c) the outward radius d) the axis of rotation

77. The instantaneous angular position of a point on a rotating wheel is given by the equation $\mathrm{q}(t) = 2t^3 - 6t^2$. The torque on the wheel becomes zero at _____ .
a) t = 1 s b) t = 0.5 s c) t = 0.25 s d) t = 2 s

78. The angular speed of an engine wheel making 90 revolutions per minute is :
a) 1.5 π rad/s b) 3 π rad/s c) 4.5 π rad/s d) 6 π rad/s

79. Which of the following statements are correct?
(i) Centre of mass of a body always coincides with the centre of gravity of the body.
(ii) Centre of mass of a body is the point at which the total gravitational torque on the body is zero.
(iii) A couple on a body produce both translational and rotational motion in a body.
(iv) Mechanical advantage greater than one means that small effort can be used to lift a large load.
a) (ii) and (iv) b) (i) and (ii) c) (ii) and (iii) d) (iii) and (iv)

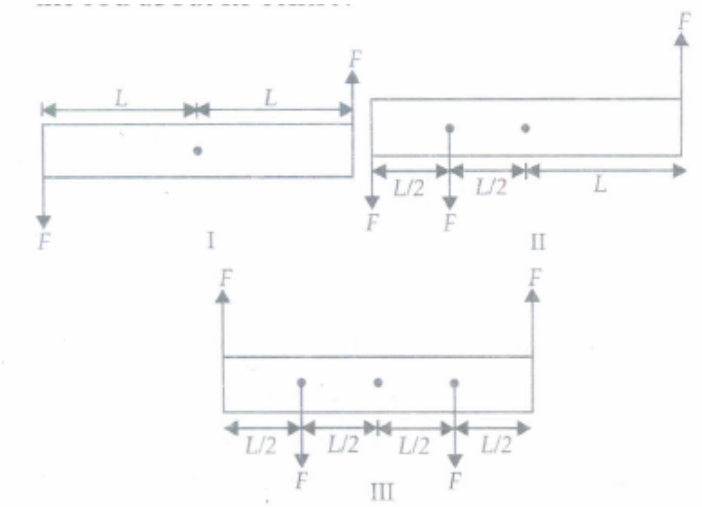
80. Two bodies of mass 1 kg and 3 kg have position vectors $\hat{i} + 2\hat{j} + \hat{k}$ and $-3\hat{i} - 2\hat{j} + \hat{k}$ respectively. The centre of mass of this system has a position vector_____
a) $-2\hat{i} - \hat{j} + \hat{k}$ b) $2\hat{i} - \hat{j} - 2\hat{k}$ c) $-\hat{i} + \hat{j} + \hat{k}$ d) $-2\hat{i} + 2\hat{k}$

81. A solid cylinder of mass M and radius R rolls without slipping down an inclined plane of length L and height h. What is the speed of its centre of mass when the cylinder reaches its bottom?
a) $\sqrt{4gh}$ b) $\sqrt{2gh}$ c) $\sqrt{\frac{3}{4}gh}$ d) $\sqrt{\frac{4}{3}gh}$

82. Angular momentum is_____
a) vector (axial) b) Vector (Potar) c) Scalar d) None of these

83. A solid cylinder of mass M and radius R rotates about its axis with angular speed (D. Its rotational kinetic energy is
a) $\frac{1}{2}MR^2w^2$ b) MR^2w^2 c) $\frac{1}{4}MR^2w^2$ d) $\frac{1}{8}MR^2w^2$

84. A rigid rod oflength 2L is acted upon by some forces. All forces labelled as F have the same magnitude. Which cases have a non-zero net torque acting on the rod about its centre?

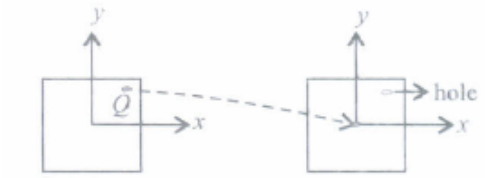


a) I and II only b) II and III only c) I and III only d) The net torque is zero in all cases.

85. At any instant, a rolling body may be considered to be in pure rotation about an axis through the point of contact axis is translating forward with speed _____.
a) equal to centre of mass b) zero c) twice of centre of mass d) None of the above

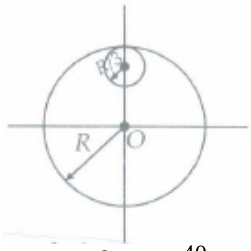
86. A spherical ball rolls on a table without slipping. Then, the fraction of its total energy associated with rotation is_____
a) $\frac{2}{5}$ b) $\frac{2}{7}$ c) $\frac{3}{5}$ d) $\frac{3}{7}$

87. A uniform square plate has a small piece Q of an irregular shape removed and glued to the centre of the plate leaving a hole behind. The moment of inertia about the z-axis is then



a) increased b) decreased c) the same d) changed in unpredicted manner

88. From a circular disc of radius R and mass 9M, a small disc of radius $\frac{R}{3}$ is removed as shown in figure. The moment of inertia of the remaining disc about an axis perpendicular to the plane of the disc and passing through O is



a) 4 MR^2 b) $\frac{40}{9}MR^2$ c) 40 MR^2 d) $\frac{37}{9}MR^2$

89. The moment of inertia of a uniform circular disc of radius R and mass M about an axis passing from the edge of the disc and normal to the disc is___
a) MR^2 b) 1/2 MR^2 c) 3/2 MR^2 d) 7/2 MR^2

90. Three identical metal balls each of radius r are placed touching each other on a horizontal surface such that an equilateral triangle is formed with centres of three balls joined. The centre of mass of the system is located at_____
a) horizontal surface b) centre of one of the balls c) line joining the centres of any two balls
d) point of intersection of the medians

91. Which of the following taxonomic categories includes one or more related orders?
a) Phylum/Division b) Genus c) Family d) Class

92. **Assertion:** Cats and dogs have some similarities.
Reason: Cats and dogs belong to the same Family Canidae.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

93. The statement 'nothing lives forever, yet life continues, illustrates the role of
a) embryogenesis b) morphogenesis c) replication d) reproduction.

94. In a taxonomic hierarchy, family is interpolated between
a) kingdom and class b) class and order c) order and genus d) class and genus

95. 'Key' is a taxonomical aid used for the identification of organisms. Each statement in key is called a_____.
a) couplet b) lead c) both (a) and (b) d) none of these

96. Select the mismatched pair.
a) Panthera lea - Belongs to Class Mammalia b) Musca domestica - The common house lizard, a reptile
c) Entamoeba coli - Commonly occurring protozoan in human intestine
d) Solanum tuberosum - A dicotyledonous plant

97. Which of the following groups consists of organisms which multiply by fragmentation?
a) Earthworm, Amoeba, fungi b) Earthworm, fungi, bacteria
c) Fungi, filamentous algae, protonema of mosses d) Amoeba, Hydra, bacteria

98. The name of a plant order ends with
a) -aceae b) -ales c) -idae d) -ae

99. Which of the following represents the correct sequence of various taxonomic categories?
a) Class-Phylum- Iribe-Order-Family-Genus- Species b) Division-Class-Family-Tribe-Order-Genus- Species
c) Division-Class-Order-Family-Tribe-Genus- Species d) Phylum-Order-Class-Tribe-Family-Genus-Species

100. A 'type' is one particular specimen (or a group of specimens) of an organism to which the scientific name of that organism is formally attached. Match column I (type) with column II (description) and select the correct option from the codes given below

Column I	**Column II**
A. Holotype	(i) A specimen cited with original description other than the holotype or isotype
B. Isotype	(ii) A duplicate of the holotype
C. Paratype	(iii) A specimen designated in the original description
D. Lectotype	(iv) A specimen selected from original material to serve as nomenclatural type when the holotype was not designated

a) A-(iii), B-(ii), C-(i), D-(iv) b) A-(iii), B-(i), C-(ii), D-(iv) c) A-(iii), B-(ii), C-(iv), D-(i)
d) A-(iii), B-(iv), C-(i), D-(ii)

101. Which of the following organisms does not reproduce?
a) Mule b) Worker bee c) Infertile human female d) All of these

102. First life on earth was _____ .
a) Cyanobacteria b) Chemoheterotrophs c) Autotrophs d) Photoautotrophs

103. In the binomial system of taxonomy, developed during the 18th century by C. Linnaeus, the second word of an organism's biological name represents
a) species b) genus c) race d) family.

104. Museums have
a) Collection of living organisms b) Dried and preserved plant specimens only
c) Animals kept in their natural habitats d) Preserved plant and animals specimens

105. Information on anyone taxon is found in
a) Manuals b) Museums c) Herbarium d) Monographs

106. In a taxonomic hierarchy, from species to kingdom
a) The number of common characters decrease b) Complexity decreases
c) More common characters are shared between members of higher taxa
d) Similarities between plants increas

107. Mammals, animals and dogs represents
a) same taxa at same levels b) same taxa at different levels c) Different taxa at same level
d) Different taxa at different levels

108. Which among the following is INCORRECT with respect to the universal rules of biological nomenclature?
a) The first word in a biological name represents the genus while the second name denotes the species
b)
The specific epithet starts with a capital letter while the generic epithet starts with a small letter. It can be illustrated with the example of mangifera indica
c) Biological names are either derived from Latin language or Latinised.
d)
Both the words in a biological name, when handwritten are separately underlined or printed in italics to indicate their Latin origin.

109. **Assertion:** Systematics is defined as the science of diversity of organisms in evolutionary context.
Reason: Systematics include interrelationship between organisms
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

110.L owest and highest taxonomic categories are respectively
a) Division, species b) Species, division c) Species, kingdom d) Phylum, genus

111. Assertion: Fruit is the mature or ripened ovary developed after fertilisation
Reason: Fruit formed without fertilisation of the ovary is called parthenocarpic fruit.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false

112.A ssertion: Monoadelphous stamens are found in pea
Reason: In pea, stamens are united into one bunch or one bundle.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false

113.I n a cereal grain the single cotyledon of embryo is represented by _____ .
a) scutellum b) prophyll c) coleoptile d) coleorhiza

114.P lacenta swollen with many ovules is present in family

a) Solanaceae b) Brassicaceae c) Lilliaceae d) Malavaceae

115. Placentation in tomato and lemon is :
a) Marginal b) Axile c) Parietal d) Free-central

116. Vivipary is _____ .
a) Seed germination with subterranean cotyledons b) Seed germination with epiterranean cotyledons
c) Fruit development without pollination d) Seed germination inside the fruit while attached to the plant

117. With respect to the given figure, select the correct option.

a) It possesses one or more nodes. b) It grows aerially for some distance and finally touches the ground.
c) It is present in Fragaria, Jasminum, etc. d) All of these

118. The type of placentation present in Dianthus is also present in
a) Primose b) Mustard c) China rose d) Marigold

119. Study carefully the given floral diagram and select the option which correctly represents the related floral formula.

(A) (B) (C)

a) $\%\,\varphi\, K_{(5)}C_{1+2+(2)}A_5\overline{G}_{(2)}$ b) $\oplus\,\varphi\, K_{(5)}C_5\ \ A_5\,\underline{G}_{(2)}$ c) $\oplus\,\varphi\, P_{5+5}A_{(5)}\underline{G}_{(2)}$

(D)

d) $\oplus\,\varphi\, K_{(5)}C_{(5)}\ \ A_5\,\underline{G}_{(2)}$

120. How many plants in the list given below have marginal placentation?
Mustard, Gram, Tulip, Asparagus, Arhar, Tobacco Sunhemp, Chilli, Colchicine, Onion, Moong, Pea, Lupin.
a) Four b) Five c) Six d) Three

121. Venation is a term used to describe the pattern of arrangement of
a) floral organs b) flower in inflorescence c) veins and veinlets in a lamina d) all of them

122. Match the columns and choose the correct option

Column I (Fruit)	**Column II (Edible part)**
a) Walnut	I) Cotyledon
b) Cashewnut	II) Seed
c) Orange	III) Endocarp
d) Strawberry	IV) Thalamus

a) a-II, b-I, c-III, d-IV b) a-II, b-III, c-I, d-IV c) a-I, b-II, c-IV, d-III d) a-I, b-II, c-III, d-IV

123. Ground nut belongs to family
a) Fabaceae b) Malvaceae c) Liliaceae d) Cucurbitaceae

124. Nicotiana, petunia belong to
a) Malvaceae b) Liliaceae c) Solonaceae d) Cruciferae

125. Non-albuminous seed is produced in:
a) Maize b) Castor c) Wheat d) Pea

126. Which of the following organisms are known as chief producers in the oceans?
a) Cyanobacteria b) Diatoms. c) Dinoflagellates d) Euglenoids.

127. Identify the given figure of a protozoan protist and select the correct option.

a) Entamoeba histolytica b) Plasmodium vivax c) Giardia intestinalis d) Trypanosoma gambiense

128. The thalloid body of a slime mould (Myxomycetes) is known as _____ .
a) Plasmodium b) Fruiting body c) Mycelium d) Protonema

129. Cyanobacteria are classified under which of the following kingdoms?
a) Monera b) Protista c) Algae d) Plantae

130. Some members are saprophytes or parasites whereas a large number of members are decomposers of litter and help in nutrient cycling in case of
a) Phycomycetes b) Deuteromycetes c) Ascomycetes d) Basidiomycetes

131. Which of the following statements is wrong for viroids?
a) They lack a protein coat. b) They are smaller than viruses. c) They cause infections.
d) Their RNA is of high molecular weight

132. Which one of the following statements about viruses is correct?
a) Viruses possess their own metabolic system b) Viruses contain either DNA or RNA
c) Viruses are facultative parasites d) Viruses are readily killed by antibiotics

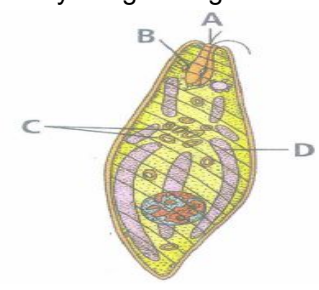
133. Members of Phycomycetes are found in
(i) aquatic habitats
(ii) on decaying wood
(iii) moist and damp places
(iv) as obligate parasites on plants.
Choose from the following options.
a) None of the above b) (i) and (iv) c) (ii) and (iii) d) All of the above

134. Plant decomposers are _____ .
a) Monera and fungi b) Fungi and plants c) Protista and animalia d) Animalia and monera

135. In general, viruses that infect plants have
a) ss-RNA b) ds-DNA c) ss-DNA d) ds-RNA

136. A slide under microscope shows following features:
(i) Unicellularity
(ii) Well defined nucleus
(iii) Biflagellate-one flagellum lying longitudinally and the other transversely
What would you identify it as?
a) Protozoan b) Bacterium c) Euglenoid d) Dinoflagellate

137. Study the given figure showing structure of Euglena and select the option that correctly identifies A, B, C and D.



a)

A	B	C	D
Cytostome	Photoreceptor	Paramylum bodies	Myonemes

b)

A	B	C	D
Contractile vacuole	Photoreceptor	Paramylum bodies	Chloroplast

c)

A	B	C	D
Cytostome	Stigma	Paramylum bodies	Chloroplast

d)

A	B	C	D
Cytostome	Stigma	Myonemes	Chloroplast

138. Which of the following environmental conditions are essential for optimum growth of Mucor on a piece of bread?
A. Temperature of about 25ºC
B. Temperature of about 5º C
C. Relative humidity of about 5%
D. Relative humidity of about 95%
E. A shady place
F. A brightly illuminated place
Choose the answer from the following options :
a) A, D and E only b) B, D and E only c) B, C and F only d) A, C and E only

139. The structures that help some bacteria to attach to rocks and / or host tissues are:
a) Fimbriae b) Mesosomes c) Holdfast d) Rhizoids

140. The chemical compounds produced by the host plants to protect themselves against fungal infection is _____ .
a) Phytotoxin b) Pathogen c) Phytoalexins d) Hormone

141. **Assertion:** Brown algae vary from olive green to brown in colour.
Reason: Fucoxanthin is responsible for colour variation in brown algae.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

142. Select the incorrect statement regarding reproduction in Rhodophyceae.
a) Asexual reproduction occurs by non-motile spores. b) Sexual reproduction occurs by motile gametes.
c) Sexual reproduction is oogamous. d) Complex post-fertilisation developmental events occur.

143. Phycoerythrin is present in
a) Euglena b) Polysiphonia c) Chlamydomonas d) Fucus.

144. In which one of these the elaters arc present along with mature spores in the capsule (to help in spore dispersal)?
a) Riccla b) Marchantia c) Funaria d) Sphagnum

145. In the prothallus of a vascular cryptogram, the antherozoids and eggs mature at different times. As a result:
a) Self fertilization is prevented b) There is no change in success rate of fertilization
c) There is high degere of sterility d) one can conclude that the plant is apomictic

146. Gymnosperms do not bear fruits because they do not have
a) seeds b) ovary c) ovule d) pollination.

147. The structures that help some bacteria to attain to rocks and /or host tissues are:
a) Holdfast b) Rhizoids c) Fimbriae d) Mesosomes

148. Conifers are adapted to tolerate extreme envionmental conditioners because of
a) Broad hardy leaves b) Superfical stomata c) Thick cuticle d) Presence of vessels

149. Plants which posseses seeds but not fruits are
a) bryophytes b) pteridophytes c) gymnosperms d) algae.

150. Which of the following shows coiled RNA strand and capsomeres?
a) Polio virus b) Tobacco masaic virus c) Measles virus d) Retrovirus

151. Each cell of Volvox colony has a structure; similar to
a) Ulothrix b) Spirogyra c) Chlamydomonas d) Nostoc.

152. Infoldings of plasma membrane in bacteria are called as:-
a) Episomes b) Plasmid c) Pili d) Mesosomes

153. Carperls are equivalent to the
a) Microsporophyllls b) Megasporophylls c) Megasporangia d) Embryo sac

154. Which one pair of examples, will correctly represent the grouping Spermatophyta according to one of the schemes of classifying plants?
a) Ginkgo, Pisum b) Acacia, Sugarcane c) Pinus, Cycas d) Rhizopus, Triticum

155. **Assertion:** Selaginella and Salvinia are homosporus.
Reason: Similar kind of spores are produced in Selaginella and Salvinia.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.

156. Which one of the following phyla is correctly matched with its two general characteristics?
a) Echinodermata - pentamerous radial symmetry and mostly internal fertilisation
b) Mollusca - normally oviparous and development through a trochophore or veliger larva
c) Arthropoda - body divided into head, thorax and abdomen and respiration by mouth
d) Chordata - notochord persists throughout and separate anal and urinary openings to the outside

157. In some chordates, the notochord is modified as the vertebral column. Such animals are called vertebrates. Which one of the following statements makes sense?
a) All chordates are vertebrates but all vertebrates are not chordates
b) All vertebrates are chordates and all chordates are vertebrates
c) All vertebrates are chordates but all chordates are not vertebrates
d) Chordates are not vertebrates and vertebrates are not chordates.

158. Pneumatic bones are expected to be found in _____ .
a) pigeon b) house lizard c) frog's tadpole d) flying fish

159. Select the correct option
a) 11th and 12th pairs of ribs are connected to the sternum with the help of hyaline cartilage.
b)
Each rib is a flat thin bone and all the ribs are connected dorsally to the thoracic vertebrae and ventrally to the sternum
c) There are seven pairs of vertebrosternal, three pairs of vertebrochondral and two pairs of vertebral ribs.
d) 8th, 9th and 10th pairs of ribs articulate directly with the sternum.

160. Malpighian tubules are _____ .
a) excretory organs of insects b) excretory organs of annelids c) respiratory organs of insects
d) respiratory organs of annelids

161. Photoreceptors of earthworm occur on _____ .
a) Clitellum b) many eyes c) Dorsal surface d) lateral sides

162. Bull frog of India is _____ .
a) Rana tigrina b) R. sylvatlca c) R. ecutesbeiana d) R. esculenta

163. Which of the following is not found in birds?
a) Hind limb b) Pectoral girdle c) Pelvic girdle d) Fore limb

164. Which of the following animals is not viviparous?
a) Whale b) Flying fox (Bat) c) Elephant d) Platypus

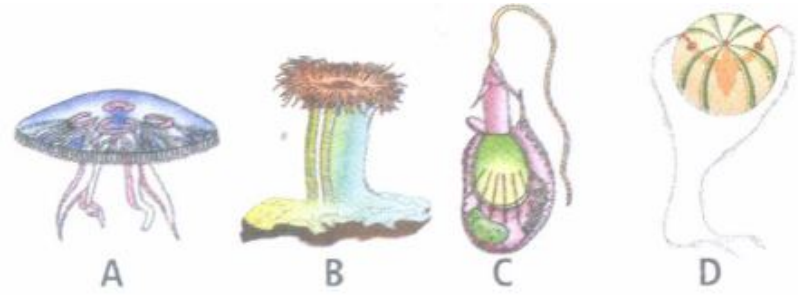
165. Coelom derived from blastocoel is known as _____ .
a) .enterocoelom b) schizocoelom c) pseudocoelom d) haemocoelom

166. Transfer of Taenia to secondary host occurs as _____ .
a) oncosphere b) cysticercus c) morula d) egg

167. Which of the following group is formed of only the hermaphrodite organisms?
a) Earthworm, tapeworm, housefly, frog b) Earthworm, tapeworm, sea horse, housefly
c) Earthworm, leech, sponge, roundworm d) Earthworm, tapeworm, leech, sponge

168. Both male and female pigeons secrete milk, through _____ .
a) salivary glands b) modified sweat glands c) crop d) gizzard

169. Identify the figures A, B, C and D and select the correct option.



a)

A	B	C	D
Pleurobrachia	Cnidoblast	Aurelia	Adamsia

b)

A	B	C	D
Aureliaa	Adamsia	Cnidoblast	Pleurobrachia

c)

A	B	C	D
Cnidoblast	Pleurobrachia	Adamsia	Aurelia

d)

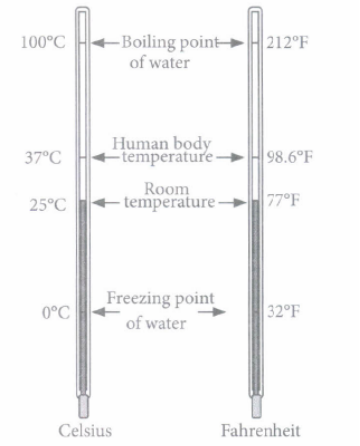
A	B	C	D
Adamsia	Aurelia	Pleurobrachia	Cnidoblast

170. Feet of kingfisher are modified for _____ .
a) wading b) perching c) running d) catching

171. The reactant which is entirely consumed in reaction is known as limiting reagent. In the reaction 2A + 4B → 3C + 4D, when 5 moles of A react with 6 moles of B, then (a) which is the limiting reagent?
(b) calculate the amount of C formed?
a) C, 4.5 mol b) B, 4.5 mol c) B, 3.5 mol d) C,4.0 mol

172. 2.82 g of glucose is dissolved in 30 g of water. The mole fraction of glucose in the solution is
a) 0.01 b) 0.99 c) 0.52 d) 1.66

173. Consider the following figure,



The correct relationship between fahrenheit and celsius scale is
a) $^\circ F = {}^\circ C + 273.15$ b) $^\circ F = \frac{2}{5}{}^\circ C + 16$ c) $^\circ F = \frac{9}{5}{}^\circ C + 32$ d) $^\circ F = \frac{1}{3}{}^\circ C + 32$

174. The number of moles of hydrogen molecules required to produce 20 moles of ammonia through Haber's process is:
a) 20 b) 30 c) 40 d) 10

175. Two elements 'P' and 'Q' combine to form a compound. Atomic mass of 'P' is 12 and 'Q' is 16. Percentage of 'P' in the compound is 27.3. What will be the empirical formula of the compound?
a) P_2Q_2 b) PQ c) P_2Q d) PQ_2

176. **Assertion:** Temperature below 0°C is possible in Celsius scale but on Kelvin scale, negative temperature is not possible.
Reason: The Kelvin scale is related to Celsius scale as K = 0°C + 273
a) Both assertion and reason are correct and reason is correct explanation for assertion.
b) Both assertion and reason are correct but reason is not correct explanation for assertion.

c) Assertion is correct but reason is incorrect. d) Assertion is incorrect but reason is correct.

177. A compound contains two elements 'X' and 'Y' in the ratio of 50% each. Atomic mass of 'X' is 20 and 'Y' is 40. What can be its simplest formula?
a) XY b) X_2Y c) XY_2 d) X_2Y_3

178. In the reaction, $4NH_3$ (g) + $5O_2$ (g)⟶ 4NO (g) + $6H_2O$ (l) When 1 mole of ammonia and 1 mole of O_2 are made to react to completion, then:
a) 1.0mole of H_2O is produced b) 1.0mole of NO will be produced c) all the oxygen will be consumed
d) all the ammonia will be consumed

179. 1 cc N_2O at NTP contains
a) $\frac{1.8}{224} \times 10^{22}$ atoms b) $\frac{6.02}{22400} \times 10^{23}$ molecules c) $\frac{1.32}{224} \times 10^{23}$ electrons d) all of the above

180. How many grams of concentrated nitric acid solution should be used to prepare 250 mL of 2.0 M HNO_3? The concentrated acid is 70% HNO_3.
a) 45.0 g conc. HNO_3 b) 90.0 g conc. HNO_3 c) 70.0 g conc. HNO_3 d) 540 g conc. HNO_3

181. The following data are obtained when dinitrogen and dioxygen react together to form different compounds:

Mass of dinitrogen	**Mass of dioxygen**
14 g	16 g
14 g	32 g
28 g	32 g
28 g	96 g

Which law of chemical combination is obeyed by the above experimental data?
a) Law of conservation of mass b) Law of definite proportions c) Law of multiple proportions
d) Avogadro's Law

182. 18.72 g of a substance ' X ' occupies 1.81 cm^3 What will be its density measured in correct significant figures?
a) 10.3 g cm^{-3} b) 10.34 g cm^{-3} c) 10.4 g cm^{-3} d) 10.3425 g cm^{-3}

183. Number of moles of MnO^-_4 required to oxidize one mole of ferrous oxalate completely in acidic medium will be:
a) 0.6 moles b) 0.4 moles c) 7.5 moles d) 0.2 moles

184. The mass of one mole of a substance in grams is called its
a) molecular mass b) molar mass c) Avogadro's mass d) formula mass

185. An element, X has the following isotopic composition ^{200}X : 90%, ^{199}X: 8.0%, ^{202}X: 2.0%. The weighted average atomic mass of the naturally occurring element X is closest to :
a) 201 amu b) 202 amu c) 199 amu d) 200 amu

186. What will be the value of modified Rydberg's constant, if the nucleus having mass m_N and the electron having mass m_e revolve around the centrer of the mass?
a) $R_H \times \frac{m_N}{m_e}$ b) $R_H \times \frac{m_e}{m_N}$ c) $R_H \times \frac{m_e}{m_N + m_e}$ d) $R_H \times \frac{m_N}{m_N + m_e}$

187. What is the K.E. of photo electrons.
a) 6.23 x 10^{-20} J b) 6.25 x 10^{-22} J c) 6.625 x 10^{-18} J d) 6.625 x 10^{-19} J

188. If first ionization potential of an atom is 16 V, then the first excitation potential will be:
a) 10.2 V b) 12 V c) 14 V d) 16 V

189. The number of sub levels in the quantum level n = 3 is
a) 1 b) 2 c) 3 d) 4

190. The atomic number of an element 'M' is 26. How many electrons are present in the M-shell of the element in its M^{3+} state?
a) 11 b) 15 c) 14 d) 13

191. Assertion: In Rutherford's α-particle scattering experiment, most of the α-particles were deflected by nearly 180^0.
Reason: The positive charge of the atom is spread throughout the atom that repelled and deflected the positively charged α-particles.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false d) If both assertion and reason are false

192. The orbital diagram in which both the Pauli's cxclusing principle and Hund's rule are violated, is:

a)  b)  c)  d) 

193. What will be the wavelength of an electron moving with $\frac{1}{10}$ th of velocity of light?

a) 2.43 x 10^{-11} m b) 243 x 10^{-11} m c) 0.243 m d) 2.43 x 10^{-4} m

194. The electron was originally in

a) n = 3 b) n = 4 c) n = 5 d) n = 2

195. The total energy of electron in an atom is a combination of potential energy (P.E) and kinetic energy (K.L). If total energy is -E for an electron in an atom, then. its (K.E) and (P.E) respectively are

a) 2E, -E b) 2E, E c) E, -2E d) E, -E

196. The number of nodes for 4f orbital is:

a) 0 b) 1 c) 2 d) 3

197. Maximum number of electrons in a sub-shell with 1 = 3 and n = 4 is :

a) 14 b) 16 c) 10 d) 12

198. How many nodal planes are there in the atomic orbitals for the principal quantum number n=3?

a) 10 b) 9 c) 11 d) 2

199. If n = 6, the correct sequence for filling of electrons will be:

a) ns $\rightarrow$ (n - 2)f $\rightarrow$(n - 1)d $\rightarrow$ np b) ns$\longrightarrow$ (n-2)f$\longrightarrow$np$\longrightarrow$ (n-l)d c) ns$\longrightarrow$np$\longrightarrow$(n-1)d$\longrightarrow$ (n-2)f

d) ns$\longrightarrow$(n -2)f$\longrightarrow$ (n -1)d$\longrightarrow$ np

200. Number of unpaired electrons in N^{2+} is/are

a) 2 b) 0 c) 1 d) 3

201. The correct order of C—O bond length among CO, CO_3^{2-}, CO_2 is :

a) $CO_2 < CO_3^{2-} < CO$ b) $CO < CO_3^{2-} < CO_2$ c) $CO_3^{2-} < CO_2 < CO$ d) $CO < CO_2 < CO_3^{2-}$

202. Which of the following options represents the correct bond order?

a) $O_2^- < O_2 < O_2^+$ b) $O_2^- < O_2 < O_2^+$ c) $O_2^- < O_2 < O_2^+$ d) $O_2^- < O_2 < O_2^+$

203. Consider the molecules CH_4, NH_3 and H_2O. Which of the given statements is false

a)

The H-C H bond angle in CH_4, the H-N-H bond angle in NH_3, and the H-O-H bond angle in H_2O are all greater than 90^o.

b) The H-O-H bond angle in H_2O is larger than the H-C-H bond angle in NH_3.

c) The H-O-H bond angle in H_2O is smaller than the H--N- H bond angle in NH_3.

d) The H-C-H bond angle in CH_4 is larger than the H-N H bond angle in NH_3.

204. Which of the following statements is not correct from the view point of molecular orbital theory?

a) Be $_2$ is not a stable molecule b) He_2 is not stable but He_2^+ is expected to exist

c)

Bond strength of N_2 is maximum amongst the homonuclear diatomic molecules belonging to the second period.

d)

The order of energies of molecular orbitals in N_2 molecule is

$< \sigma 2s < \sigma^* 2s < \sigma 2p_z < (\pi 2p_x = \pi 2p_y) < (\pi * 2p_x = \pi 2p_y) < \sigma * 2p_z$

205. Mark the incorrect statement in the following.

a) The bond order in the species $O_2, O_2^+ and\ O_2^-$ decreases as $O_2^+ > O_2 > O_2^-$

b) The bond energy in a diatomic molecule always increases when an electron is lost

c) Electrons in antibonding MO contribute to repulsion between two atoms

d) With increase in bond order bond length decreases and bond strength increases

206. For which element would XH3 be a stable species?

a) C b) Cl c) P d) S

207. The increasing order of energies of various molecular orbitals of N_2, is given below:
$\sigma 1\,\mathrm{s} < \sigma^* 1\,\mathrm{s} < \sigma 2\,\mathrm{s} < \sigma^* 2\,\mathrm{s} < \pi 2\mathrm{p_x} = \pi 2\mathrm{p_y} < \sigma 2\mathrm{p_z} < \pi^* 2\mathrm{p_x} = \pi^* 2\mathrm{p_y} < \sigma^* 2\mathrm{p_z}$
The above sequence is not true for the molecule:
a) C_2 b) B_2 c) O_2 d) Be_2

208. The correct order of the lattice energies of the following ionic compounds is:
a) NaCl > $MgBr_2$ > CaO > Al_2P_3 b) $A1_2O_3$ > $MgBr_2$ > CaO > NaCl c) $MgBr_2$ >Al20} > CaO > NaCl
d) Al_2O_3 > CaO > $MgBr_2$ > NaCl

209. Arrange the following in order of increasing dipole moment: H_2O, H_2S, BF_3.
a) $BF_3 < H_2S < H_2O$ b) $H_2S < BF_3 < H_2O$ c) $H_2O < H_2S < BF_3$ d) $BF_3 < H_2O < H_2S$

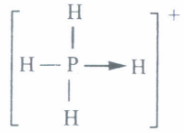
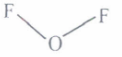
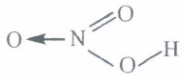
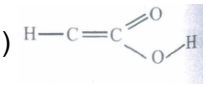
210. Which contains both polar and non-polar covalent bonds?
a) HCN b) CO_2 c) H_2O_2 d) CH_4

211. **Assertion:** O_2 molecule is diamagnetic while C_2 molecule is paramagnetic in nature.
Reason: Bond order of O_2 molecule is 1.5 and that of C_2 molecule is 2.5.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true and reason is the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.

212. The number of sigma (σ) and pi (π) bonds in pent-2-en-4- yne is:
a) 8σ bonds and 5 π bonds b) 11σ bonds and 2π bonds c) 13σ bonds and no π bonds
d) 10σ bonds and 3π bonds

213. For two ionic solids CaO and KI, identify the wrong statement among the following :
a) Lattice energy of CaO is much large than that of KI b) KI is soluble in benzene
c) CaO has higher melting point d) CaO has higher melting point

214. Linear combination of two hybridized orbitals belonging to the two atoms, each having one electron leads to a :
a) Sigma bond b) Double bond c) Coordinate bond d) Pi-bond

215. Which formulae does not correctly represents the bonding capacity of the atom involved?
a)  b)  c)  d) 

216. Which one of the following species does not exist under normal conditions?
a) Be_2^+ b) Be_2 c) B_2 d) Li_2

217. How many number of electrons are involved in the formation of a nitrogen molecule?
a) Three b) Four c) Eight d) Six

218. The dipole moment of HBr is 2.6 x 10^{-30} Cm and the inter atomic spacing is 1.41 $\mathrm{\AA}$. The percentage of ionic character in HBr is:
a) 99.5 % b) 11.5% c) 74.3% d) 25%

219. Which of the following statements is correct regarding the structure of PCl_5?
a) Three P-Cl bonds lie in one plane and two P- Cl bonds lie above and below the equatorial plane.
b) Five P-Cl bonds lie in the same plane. c) The bond angle in all P-Cl bonds is 90°.
d) The bond length of all P-Cl bonds is same.

220. Propyne molecule contains:
a) 6 sigma and 2 pi bonds b) S sigma bonds c) S pi bonds and I sigma bond d) 2 sigma and 3 pi bonds.

221. As sp^3 hybrid orbital contains :
a) $\frac{1}{4}$ s-character b) $\frac{1}{2}$ s-character c) $\frac{1}{3}$ s-character d) $\frac{2}{3}$ s-character

222. Which of the following statements is not true?
a) Intermolecular hydrogen bonds are formed between two different molecules of compounds.
b) Intramolecular hydrogen bonds are formed between two different molecules of the same compound.
c) Intramolecular hydrogen bonds are formed within the same molecule.
d) Hydrogen bonds have strong influence on the physical properties of a compound.

223. How many and what types of bonds are present in NH_4^+?

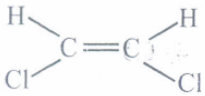
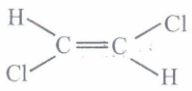
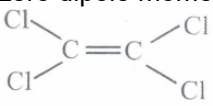
a) Four covalent bonds b) Three covalent bonds and one ionic bond c) Four ionic bonds
d) Three covalent bonds and one coordinate bond

224. The higher values of specific heat of water than other liquids has been accounted in terms of:
a) high dielectric constant b) polarity c) H-bonding d) boiling point

225. Which type of overlapping is shown by p (P_x' P_y and p_z)-orbitals?
a) Two end to end and one sidewise overlap b) Two sidewise and one end to end overlap
c) Three sidewise overlaps d) Three end to end overlaps

226. The correct order of decreasing bond lengths of CO, CO_2 and CO_3^{2-} is
a) CO > CO_2 > CO_3^{2-} b) CO_3^{2-} > CO_2 > CO c) CO_2 > CO > CO_3^{2-} d) CO_2 > CO_3^{2-} > CO

227. According to MO theory which of the following lists ranks the nitrogen species in terms of increasing bond order?
a) $N_2^{2-} < N_2^- < N_2$ b) $N_2 < N_2^{2-} < N_2^-$ c) $N_2^- < N_2^{2-} < N_2$ d) $N_2^- < N_2 < N_2^{2-}$

228. Select the isomers given below, which have non-zero dipole moment ?
a)  b)  c)  d) All of these

229. The pairs of species of oxygen and their magnetic behaviours are noted below. Which of the following presents the correct description
a) $O_2, {O_2}^{2-}$ Both diamagnetic b) O^+, O_2^2- Both pararnagnetic c) O_2^+, O_2 - Both pararnagnetic
d) $O, {O_2}^{2-}$ Both pararnagnetic

230. Assertion: The chemistry of the early actinoids is more complicated than the corresponding lanthanoids.
Reason: Outer electronic configuration of actinoids is (n - 2)f^{1-14} (n - 1)d^{0-1} ns^2.
a) If both assertion and reason are false.
b) If both assertion and reason are true and reason is the correct explanation of assertion.
c) If both assertion and reason are true but reason is not the correct explanation of assertion.
d) If assertion is true but reason is false.

231. Element with atomic number 52 belongs to
a) s-block b) p-block c) d-block d) f-block

232. Predict the formula of stable compound formed by an element with atomic number 114 and fluorine.
a) AF_3 b) AF_2 c) AF d) AF_4

233. Which group of elements shows lowest ionisation enthalpy?
a) Alkali metals b) Alkaline earth metals c) Halogens d) Noble gases

234. Identify the correctly matched set among the following
a) Scandium-d-block-representative element b) Lanthanum-d-block-innertransition element
c) Cerium-f-block-transition element d) Actinium-d-block-transition element

235. What is the position of the element in the periodic table satisfying the electronic configuration (n - 1) d^1 ns^2 for n = 4?
a) 3rd period and 3rd group b) 4th period and 3rd group c) 3rd period and 2nd group
d) 4th period and 2nd group

236. Which of the following pairs of ions have the same electronic configuration:
a) Cr^{+3}, Fe^{+3} b) Sc^{+3}, Cr^{+3} c) Fe^{3+}, Co^{+3} d) Fe^{3+}, Mn^{2+}

237. Which one of the following oxides is expected to exhibit paramagnetic behaviour:
a) CO_2 b) SiO_2 c) SO_2 d) ClO_2

238. The property of an element that is not determined directly but is obtained indirectly using Bom Haber cycle:
a) Ionisation potential b) Electron affinity c) Electronegativity d) Metallic character

239. Which of the following is the correct order of size of the given species?
a) I > I^- > I^+ b) 1^+ > I^- > I c) I > I^+ > I^- d) I^- > I > I^+

240. Assertion: The atomic size generally increases across a period and decreases down the group.
Reason: Atomic size depends upon valence shell electronic configuration.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

241. Fill in the blanks with appropriate option.
The ability of an atom to attract shared electrons to itself is called (i). It is generally measured on the (ii)scale. An arbitrary value of (iii) is assigned to fluorine (have greatest ability to attract electrons). It generally (iv) across a period and (v) down a group

a)

i	ii	iii	iv	v
polarity	Pauling	2.0	decreases	increases

b)

i	ii	iii	iv	v
electronegativity	Pauling	4.0	decreases	increases

c)

i	ii	iii	iv	v
valency	Mulliken	1.0	decreases	increases

d)

i	ii	iii	iv	v
electron affinity	Mulliken	2.0	increases	increases

242. Set of elements with the following atomic numbers belong to the same group
a) 9, 16, 35, 3 b) 12, 20, 4, 38 c) 11, 19, 27, 5 d) 24, 47, 42, 55

243. Match the column I with column II and mark the appropriate choice.

Column I (Atomic number)		Column II (Period, Group)	
(A)	14	(i)	3, 14
(B)	53	(ii)	5, 2
(C)	38	(iii)	6, 10
(D)	78	(iv)	5, 17

a) (A) ⟶ (ii), (B) ⟶ (iv), (C) ⟶ (iii), (D) ⟶ (i) b) (A)·⟶ (i), (B) ⟶ (iv), (C) ⟶ (ii), (D) ⟶ (iii)
c) (A) ⟶ (iii), (B) ⟶ (ii), (C) ⟶ (i), (D) ⟶ (iv) d) (A) ⟶ (ii), (B) ⟶ (i), (C) ⟶ (iii), (D) ⟶ (iv)

244. Which of the following order of radii is correct?
a) Li < Be < Mg b) $H^+ < Li^+ < H^-$ c) O < P < Ne d) $Na^+ > F^- > O^{-2}$

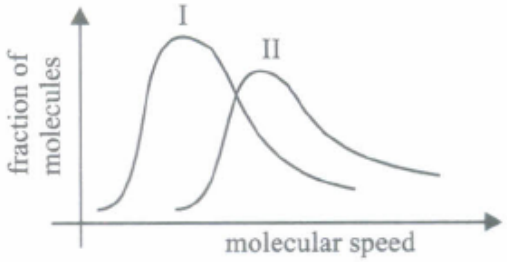
245. In a flask of volume V litres, 0.2 mol of oxygen, 0.4 mol of nitrogen, 0.1 mol of ammonia and 0.3 mol of helium are enclosed at 27°C. If the total pressure exerted by these non-reacting gases is one atmosphere, the partial pressure exerted by nitrogen is
a) 0.1 atmosphere b) 0.2 atmosphere c) 0.3 atmosphere d) 0.4 atmosphere

246. Compressibility factor of a gas is given by the equation $Z = \frac{PV}{nRT}$. on this basis, mark the correct statement.
a) When Z > 1, real gases get compressed easily b) When Z = 1 real gases get compressed easily
c) When Z > 1, real gases are difficult to compress d) When Z = 1, real gases are difficult to compress.

247. When is the deviation more in the behaviour of a gas from the ideal gas equation pV = nRT?
a) At high temperature and low pressure b) At low temperature and high pressure
c) At high temperature and high pressure d) At low temperature and low pressure

248. The gas which can be liquified under high pressure at 4°C is
a) nitrogen b) hydrogen c) oxygen d) ammonia

249. The graphs representing distribution of molecular speeds at 300 K for gases Cl_2 and N_2 are as shown in fig. (atomic mass N = 14, Cl = 35.5).



Select the correct option.
a) I graph is for N_2 and II is for Cl_2 b) II graph is for N_2 and I is for Cl_2
c) Either graph can be taken for N_2 or Cl_2 d) Information is not sufficient.

250. What is SI unit of viscosity coefficient (η)?
a) pascal b) N s m^{-2} c) km^{-2} s d) N m^{-2}

251. In Duma's method of estimation of nitrogen 0.35gm of an organic compound gave 55 ml of nitrogen collected at 300 K temperature and 715mm pressure. The percentage composition of nitrogen in the compound would be (Aqueous tension at 300K = 15mm)
a) 16.45 b) 17.45 c) 14.45 d) 15.45

252. In a gaseous mixture at 4 atm pressure, 25°% of molecules are Nitrogen, 40% of molecules ar carbon dioxide and the rest are oxygen The partial pressure of oxygen in the mixture is
a) 1.40 atm b) 1.6 atm c) 1 atm d) 0.9 atm

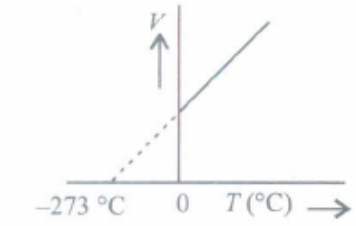
253. Assuming the molecules of gas as hard spheres of radius 2.0 x 10^{-10} m the fraction of volume occupied by the molecules to the total volume of a given amount of gas at 27°C and at 1 bar pressure and 10 bar pressure respectively are:
a) 99.9%, 99% b) 0.082%, 0.82% c) 99%, 90% d) 11%, 10%

254. According to Graham's law at a given temp, the ratio of diffusion γ_A/γ_B of gases A and B is given by
a) $\left(\frac{P_A}{P_B}\right)\left(\frac{M_A}{M_B}\right)^{\frac{1}{2}}$ b) $\left(\frac{M_A}{M_B}\right)\left(\frac{P_A}{P_B}\right)^{\frac{1}{2}}$ c) $\left(\frac{P_A}{P_B}\right)\left(\frac{M_B}{M_A}\right)^{\frac{1}{2}}$ d) $\left(\frac{M_A}{M_B}\right)\left(\frac{P_B}{P_A}\right)^{\frac{1}{2}}$

255. A mixture of dihydrogen and dioxygen at one bar pressure contains 20% by weight of dihydrogen. Calculate the partial pressure of dihydrogen.
a) 0.8 b) 1.8 c) 2.8 d) 3.0

256. If for two gases of molecular weights M_A and M_B at temperature T_A and T_B, respectively, $T_AM_B = T_BM_A$, then which property has the same magnitude for both the gases?
a) PV if mass of gases taken are same b) pressure c) KE per mol d) V_{rms}

257. If we plot volume of a certain mass of a gas against temperature at constant pressure, we get a straight line intersecting on the negative side at -273°C which explains about absolute zero. This graph is known as



a) isochor b) isotherm c) isotone d) isobar

258. Which set of conditions represents easiest way to liquefy a gas?
a) Low temperature and high pressure b) High temperature and low temperature
c) Low temperature and low pressure d) High temperature and high pressure

259. 0.3 g of a gas has a volume of 112 ml at 0°C and 2atm pressure. Its Molecular weight is
a) 60 b) 30 c) 44 d) 28

260. A 10 lt vessel contains He gas at 10 atm and TK. How many balloons of one litre capacity at 1 atm and 2TK can be filled by using the gas present in the cylinder:
a) 200 b) 190 c) 180 d) 170

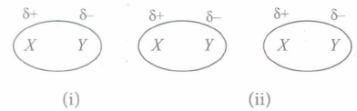
261. The pressure of a mixtures of equal weights of two gases X and Y with molecular weight 4 and 40 respectively is 1.1 atm. The partial pressure of the gas X in the mixture is
a) 1 atm b) 0.1 atm c) 0.15 atm d) 0.5 atm

262. Surface tension does not vary with
a) temperature b) concentration c) size of the surface d) vapour pressure.

263. A real gas obeying van der Waals equation will resemble ideal gas, if the
a) constants a and b both are small b) a is large and b is small c) a is small and b is large
d) constants a and b both are large

264. Two flasks A and B have equal volumes. A is maintained at 300 K and B at 600 K. while A contains H_2 gas, B has an equal mass of CO_2 gas. Find the ratio of total K. E. of gases in flask A to that of B
a) 1 : 2 b) 11 : 1 c) 33 : 2 d) 55 : 7

265. Study the figures given below and identify the type of interaction between XY - XY molecules.



a) Dipole-Induced dipole b) Dipole- Dipole c) Dispersion forces d) Induced dipole-Induced dipole.

266. Positive deviation from ideal behaviour takes place because of:

a) Molecular interaction b/w atoms and $\frac{PV}{nRT}$>1 b) Molecular interaction b/w atoms and $\frac{PV}{nRT} < 1$

c) Finite size of atoms and $\frac{PV}{nRT} > 1$ d) Finite size of atoms and $\frac{PV}{nRT} < 1$

267. At low pressure Vander Waal's equation for 3 moles of a real gas will have its simplified from

a) $\frac{PV}{RT-(3a/V)} = 3$ b) $\frac{PV}{RT+RB} = 3$ c) $\frac{PV}{RT-3Pb} = 1$ d) $\frac{PV}{RT-(9/V)} = 3$

268. In a ten litre vessel, the total pressure of a gaseous mixture containing H_2, N_2 and CO_2 is 9.8 atm. The partial pressure of H_2 and N_2 are 3.7 and 4.2 atm respectively. Then the partial pressure of CO_2 is:

a) 1.9 atm b) 0.19 atm c) 2.4 atm d) 0.019 atm

269. The reaction between gaseous NH_3 and HBr produces a white solid NH_4Br. Suppose a small quantity of gaseous NH_3 and gaseous HBr are introduced simultaneously into opposite ends of an open tube which is one metre long. Calculate the distance of white solid formed from the end which was used to introduce NH_3.

a) At a distance of 34.45 cm from NH_3 end b) At a distance of 68.5 cm from NH_3 end

c) At a distance of 44.45 cm from HBr end d) At a distance of 45.45 cm from HBr end

270. Which of the following is not a correct expression regarding the units of coefficient of viscosity?

a) dyne cm^{-2} s b) dyne cm^2 S^{-1} c) N m^{-2} s d) Pa s

271. Increase in kinetic energy can overcome intermolecular forces of attraction. How will the viscosity of liquid be affected by the increase in temperature?

a) Increase b) No effect c) Decrease d) No regular pattern will be followed.

272. What is the density of N_2 gas at 227°C and 5.00 atm pressure? (R = 0.0821 atm K^{-l} mol^{-l}):

a) 0.29 g/ml b) 1.40 g/ml c) 2.81 g/ml d) 3.41 g/ml

273. A reaction in which reactants (R) are converted into products (P) follows second order kinetics. If concentration of R is increased by four times, what will be the increase in the rate of formation of P?

a) 9 times b) 4 times c) 16 times d) 8 times

274. The overall rate of a reaction is governed by

a) the rate of fastest intermediate step b) the sum of the rates of all intermediate steps

c) the average of the rates of all the intermediate steps d) the rate of slowest intermediate step

275. The decomposition of a substance follows first order kinetics. If its concentration is reduced to 1/8 of its initial value in 12 minutes, the rate constant of the decomposition system is

a) $\left(\frac{2.303}{12}\log\frac{1}{8}\right) min^{-1}$. b) $\left(\frac{2.303}{12}\log 8\right) min^{-1}$. c) $\left(\frac{0.693}{12}\right) min^{-1}$. d) $\left(\frac{1}{12}\log 8\right) min^{-1}$.

276. Which one of the following is wrongly matched?

a) Saponification of $CH_3COOC_2H_5$ - Second order reaction

b) Hydrolysis of CH_3COOCH_3 - Pseudounimolecular reaction c) Decomposition of H_2O_2 - First order reaction

d) Combination of H_2 and Br_2 to give HBr - Zero order reaction

277. Compounds 'A' and 'B' react according to the following chemical equation.

$A_{(g)} + 2B_{(g)} \longrightarrow 2C_{(g)}$

Concentration of either 'A' or 'B' were changed keeping the concentrations of one of the reactants constant and rates were measured as a function of initial concentration. Following results were obtained. Choose the correct option for the rate equations for this reaction.

Experiment	Initial concentration of [A]mol L^{-1}	Initial concentration of [B] /mol L^{-1}	Initial rate of formation of [C]/mol $L^{-1}s^{-1}$

1.	0.30	0.30	0.10
2.	0.30	0.60	0.40
3.	0.60	0.30	0.20

a) Rate = k $[A]^2$ [B] b) Rate = k [A] $[B]^2$ c) Rate = k [A] [B] d) Rate = k [A] $[B]^0$

278. Which of the following statements is not correct about order of a reaction?

a) The order of a reaction can be a fractional number

b) Order of a reaction is experimentally determined quantity

c)

The order of a reaction is always equal to the sum of the stoichiometric coefficients of reactants in the balanced chemical equation for a reaction

d)

The order of a reaction is the sum of the powers of molar concentration of the reactants in the rate law expression

279. Consider the reaction: $2N_2O_4 \rightleftharpoons 4NO_2$ if $-\frac{d[N_2O_4]}{dt}$=k and $\frac{d[NO_2]}{dt}$=k' then

a) 2k'=k b) k'=2k c) k'=k d) k=$\frac{1}{4}$k'

280. For the reaction $N_2 + 3H_2 \longrightarrow 2NH_3$, if $\frac{d[NH_3]}{dt}$=2 x 10^{-4} mol L^{-1} s^{-1}, the value of $\frac{-d[H_2]}{dt}$ would be:

a) 3 x 10^{-4} mol $L^{-1}s^{-l}$ b) 4 X 10^{-4} mol $L^{-1}s^{-l}$ c) 6 X 10^{-4} mol L^{-1} s^{-l} d) 1 x 10^{-4} mol $L^{-1}s^{-l}$

281. The unit of rate constant for a zero order reaction is:

a) $\text{mol L}^{-1}\ \text{s}^{-1}$ b) $\text{L mol}^{-1}\ \text{s}^{-1}$ c) $\text{L}^2\ \text{mol}^{-2}\ \text{s}^{-1}$ d) s^{-1}

282. For a reaction X ⟶ Y, the rate of reaction becomes twenty seven times when the concentration of X is increased three times. What is the order of the reaction?

a) 2 b) 1 c) 3 d) 0

283. A first order reaction takes 40 min for 30% decomposition. What will be $t_{1/2}$?

a) 77.7 min. b) 52.5 min c) 46.2 min. d) 22.7 min

284. Which of the following factors are responsible for the increase in the rate of a surface catalysed reaction?

(i) A catalyst provides proper orientation for the reactant molecules to react.

(ii) Heat of adsorption of reactants on a catalyst helps reactant molecules to overcome activation energy.

(iii) The catalyst increases the activation energy of the reaction.

a) (i) and (iii) b) (i) and (ii) c) (ii) and (iii) d) (i), (ii) and (iii)

285. The hydrolysis of ethyl acetate,

$CH_3COOC_2H_5 + H_2O \xrightarrow{H^+} CH_3COOH + C_2H_5OH$ is a reaction of

a) zero order b) pseudo first order c) second order d) third order

286. For a certain reaction a large fraction of molecules has energy more than the threshold energy, still the rate of reaction is very slow. The possible reason for this could be that

a) the colliding molecules could be large in size

b) the colliding molecules must not be properly oriented for effective collisions

c) the rate of reaction could be independent of the energy d) one of the reactants could be in excess

287. For the reaction $N_2 + 3H_2 \longrightarrow 2NH_3$ how are the rate of reaction expressions inter-related $\frac{d[H_2]}{dt}$ and $\frac{d[NH_3]}{dt}$?

a) $-\frac{1}{3}\frac{d[H_2]}{dt} = +\frac{1}{2}\frac{d[NH_3]}{dt}$ b) $-\frac{1}{2}\frac{d[H_2]}{dt} = +\frac{1}{3}\frac{d[NH_3]}{dt}$ c) $+\frac{1}{2}\frac{d[H_2]}{dt} = -\frac{1}{3}\frac{d[NH_3]}{dt}$

d) $+\frac{1}{3}\frac{d[H_2]}{dt} = -\frac{1}{2}\frac{d[NH_3]}{dt}$

288. The plot of concentration of the reactant versus time for a reaction is a straight line with a negative slope. This reaction follows :

a) zero order rate equation b) first order rate equation c) second order rate equation

d) third order rate equation

289. For the reaction $2\ N_2O_5 \rightarrow 4NO_2 + O_2$ rate and rate constant are $1.02 \times 10^{-4}\ \text{mol lit}^{-1}\text{sec}^{-1}$ and $3.4 \times 10^{-5}\text{sec}^{-1}$ respectively, then concentration of N_2O_5 at that time will be:

a) 1.732 M b) 3 M c) 3.4 x 10^5 M d) 1.02 x 10^{-4} M

290. When a catalyst is used in an equilibrium process,
a) it increases the rate of forward reaction b) it decreases the rate of backward reaction
c) it decreases activation energy of forward process and decreases activation energy of backward process
d) it fastens the attainment of equilibrium by lowering activation energy

291. In a first order reaction, A $\longrightarrow$ B, if k is rate constant and initial concentration of the reaction A is 0.5 M, then the half-life is :
a) $\frac{0.693}{0.5k}$ b) $\frac{log\ 2}{k}$ c) $\frac{log\ 2}{k\sqrt{0.5}}$ d) $\frac{ln\ 2}{k}$

292. Which of the following statements is not correct?
a) For a zero order reaction, $t_{1/2}$ is proportional to initial concentration
b) The relationship of variation of rate constant with temperature is given by $\frac{k_2}{k_1} = \frac{E_a}{2.303R}\left[\frac{T_2 - T_1}{T_1 T_2}\right]$.
c) The unit of rate constant for a reaction is $mol^{1-n}L^{n-1}s^{-1}$ where n is order of the reaction
d) The unit of rate of reaction changes with order of reaction

293. Fill up the following with suitable terms.
(i) Activation energy = Threshold energy __
(ii) Half-life period of zero order reaction = __
(iii) Average rate of reaction = ____
(iv) Instantaneous rate of reaction = _____

a)

(i)	(ii)	(iii)	(iv)
Potential energy	$\frac{0.693}{k}$	$\frac{dx}{dt}$	$\frac{\triangle[A]}{\triangle t}$

b)

(i)	(ii)	(iii)	(iv)
Energy of reactants	$\frac{1}{k}$	$\frac{\triangle[A]}{\triangle t}$	$\frac{dx}{dt}$

c)

(i)	(ii)	(iii)	(iv)
Energy of reaction	$\frac{logk}{t}$	$\frac{\triangle[A]}{\triangle t}$	$\frac{dx}{dt}$

d)

(i)	(ii)	(iii)	(iv)
Average kinetic energy of reactants	$\frac{a}{2k}$	$\frac{\triangle[A]}{\triangle t}$	$\frac{dx}{dt}$

294. Assertion: All molecular collisions lead to the formation of products.
Reason: Reactant molecules undergo chemical change irrespective of their collision
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

295. Assertion: E_a of the forward reaction is higher than that of backward reaction in a reversible endothermic reaction.
Reason: Increasing the temperature of the substance increases the fraction of molecules which collide with energies greater than E_a.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

296. For a first order reaction A $\longrightarrow$ B, the reaction rate at reactant concentration of 0.01 M is found to be 2.0 x 10^{-5} mol L^{-1} s^{-1}. The half-life period of the reaction is :
a) 220 s b) 30 s c) 300 s d) 347 s

297. For a first order reaction, the ratio of the time taken for 7/8th of the reaction to complete to that of half of the reaction to complete is
a) 3:1 b) 1:3 c) 2:3 d) 3:2

298. The chemical reaction, $2O_3 \longrightarrow 3O_2$ proceeds as
$O_3 \rightleftharpoons O_2 + [O]$ (fast)
$[O] + O_3 \xrightarrow{k_2} 2O_2$ (slow)
The rate law expression will be
a) Rate = k[O][O_3] b) Rate = k[O_3]^2 [O_2]$^{-1}$ c) Rate = k[O_3]^2 d) Rate = k[O_2] [O]

299. The bromination of acetone that occurs in acid solution is represented by this equation

$CH_3COOH_3(aq) + Br_2(aq) \rightarrow CH_3COCH_2Br(aq) + H^+(aq) + Br^-(aq)$

These kinetic data were obtained for given reaction concentrations.

Initial concentrations, M

$[CH_3COOH_3]$	$[Br_2]$	$[H^+]$
0.30	0.05	0.05
0.30	0.10	0.05
0.30	0.10	0.10
0.40	0.05	0.20

initial rate, disappearance of Br_2, Ms^{-1}

5.7×10^{-5} 5.7×10^{-5}

1.2×10^{-4} 3.1×10^{-4}

Base on these data, the rate equations is:

a) $\text{Rate} = k[CH_3COCH_3][H^+]$ b) $\text{Rate} = k[CH = COCH_3][Br_2]$

c) $\text{Rate} = k[CH_3COCH_3][Br_2][H^+]^2$ d) $\text{Rate} = k[CH_3COCH_3][Br_2][H^+]$

300. In a zero-order reaction for every 10^o rise of temperature, the rate is doubled. If the temperature is increased from 10°C to 100°C, the rate of the reaction will become:

a) 256 times b) 512 times c) 64 times d) 128 times