

LALAN'S ALL INDIA TEST SERIES

NEET 2022-23

PART TEST-1

PHYSICS , CHEMISTRY, BOTANY & ZOOLOGY

Time : 3 hrs. 20 Min.

Max. Marks:- 720

Date :

INSTRUCTIONS :

1. The test is of **3 hrs. 20 Min.** duration and the TEST BOOKLET contains 200 multiple choice questions (Four options with a single correct answer). There are two sections in each subject, i.e. Section A & Section B. You have to attempt all 35 questions from Section A & only 10 questions from Section B out of 15. **(Candidates are advised to read all 15 questions in each subject of Section B before they start attempting the question paper. In the event of a candidate attempting more than ten questions, the first ten questions answered by the candidate shall be evaluated)**
2. The Test Booklet consists of 200 questions. The maximum marks are **720**.
3. There are four parts in the question paper A, B, C consisting of Physics, Chemistry, Botany and Zoology having **50 questions** in each part of equal weightage.

Marking Scheme for MCQs

Correct Answer Four mark (+4), Incorrect Answer Minus one mark (-1), Unanswered No mark (0)

4. There is only one correct response for each question. Filling up more than one response in each question will be treated as wrong response and marks for wrong response will be deducted accordingly.



Lalan's Coaching

CLASSES

CRAFTING DREAMS INTO REALITY...

Name :.....

Address :.....

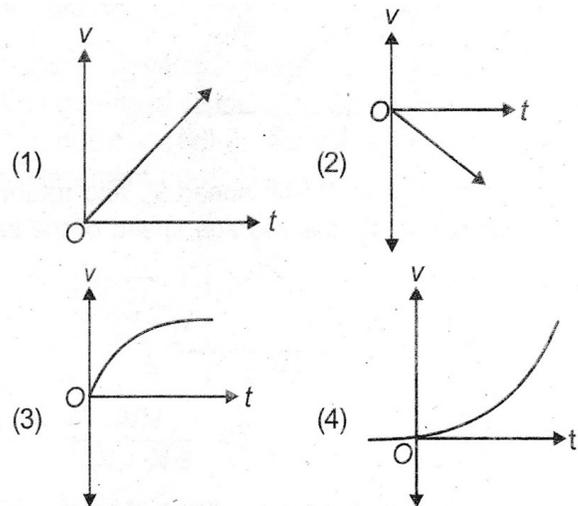
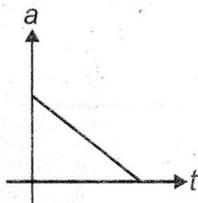
Phone/Mobile No.

Roll No.

PHYSICS

SECTION-A

- A car covers $\frac{2}{5}$ th of a distance at a speed of 80 km/h and $\frac{3}{5}$ th of the distance at a speed of 60 km/h. Average speed of car for complete journey is
 - 65 km/h
 - 70.5 km/h
 - 66.67 km/h
 - 77.5 km/h
- A body starting from rest moves with uniform acceleration on a horizontal surface. The body covers 3 consecutive equal distances from beginning in time t_1 , t_2 and t_3 seconds. The ratio of $t_1 : t_2 : t_3$ is
 - 1 : 2 : 3
 - 1 : $\sqrt{2}$: $\sqrt{3}$
 - 1 : ($\sqrt{2}-1$) : ($\sqrt{3}-\sqrt{2}$)
 - $\sqrt{3} : \sqrt{2} : 1$
- A bird is flying due-North at a speed of 10 m/s. A train 250 m long is also travelling due North at a speed of 20 m/s. Bird and train are moving in the same vertical plane. How long will the train take to overtake the bird completely?
 - 25 s
 - 50 s
 - 20 s
 - 8.33 s
- A stone is dropped into water from a bridge 44.1 m above the water. Time taken by the stone to reach water is
 - 1 s
 - 3 s
 - 2 s
 - 4 s
- For the given acceleration (a) versus time (t) graph of a body. The body is initially at rest. The velocity (v) versus time (t) graph will be



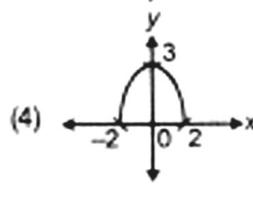
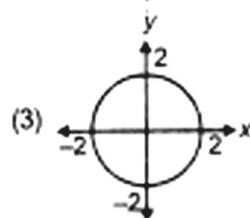
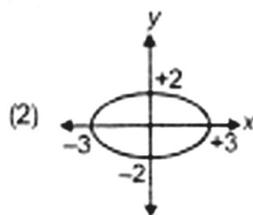
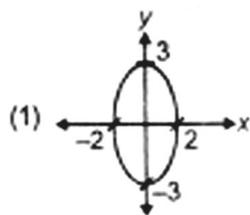
- A ball is dropped from the roof of a lift. At this moment the lift is moving downward with an acceleration ' a ' ($a < g$). The ratio of acceleration of the ball for an observer inside the lift to the acceleration of ball for an observer on the ground will be
 - $(g + a) : g$
 - $g : (g + a)$
 - $(g - a) : g$
 - $(g - a) : (g - a)$
- A particle moves with a velocity $v = \alpha t^3$ along a straight line. The average speed in time interval $t = 0$ to $t = T$ is
 - αT^3
 - $\frac{\alpha T^3}{2}$
 - $\frac{\alpha T^3}{3}$
 - $\frac{\alpha T^3}{4}$
- The speed of a projectile projected from a level ground at its maximum height is found to be half of its speed of projection (u). Its maximum height is
 - $\frac{3u^2}{8g}$
 - $\frac{3u^2}{2g}$
 - $\frac{\sqrt{3}u^2}{2g}$
 - $\frac{3u^2}{4g}$

9. A body moved along x axis and y -axis according to equation

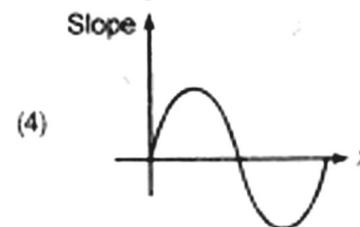
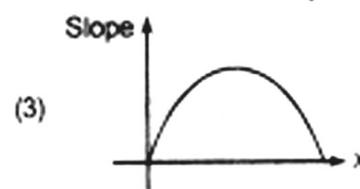
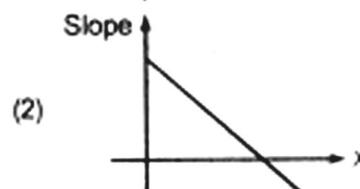
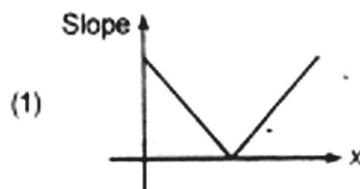
$$x = 2 \sin \theta$$

$$y = 3 \cos \theta$$

What is the trajectory followed by the body?



10. A particle of mass m is projected with a velocity at an angle with the horizontal into a uniform gravitational field. The slope of the trajectory varies with horizontal distance x as



11. A projectile thrown at an angle 30° with horizontal from level ground reaches to maximum height 20 m. What will be the maximum height if it is thrown at an angle 60° with same speed?

- (1) 20 m (2) 30 m
(3) 50 m (4) 60 m

12. A body moving in uniform circular motion with speed v , the magnitude of change in its velocity after it rotate by an angle 120° is

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

13. A car moves on a circular path such that its speed is given by $v = Kt$, where $K = \text{constant}$ and t is time, the radius of circular path is r , then net acceleration of the car at time t is

(1) $\sqrt{K^2 + \left(\frac{K^2 t^2}{r}\right)^2}$ (2) $2K$

(3) K (4) $\sqrt{K^2 + K^2 t^2}$

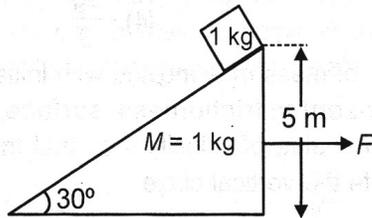
14. An object of mass 10 kg is projected from level ground with speed 40 m/s at angle 30° with horizontal. The rate of change of momentum of object [in SI units] 1 second after the projection is [neglect air resistance]

- (1) 100 (2) 50
(3) 25 (4) 75

15. A particle is projected horizontally with speed 20 m/s from a cliff of height 20 m. The magnitude of velocity of particle when it reaches ground

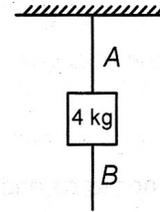
- (1) 20 m/s (2) 40 m/s
(3) $20\sqrt{2}$ m/s (4) Zero

16. A small block of mass 1 kg is placed initially at rest on the top of an inclined wedge as shown in figure. Height of vertical side of wedge is 5 m. Now wedge is pulled with a force of $10\sqrt{3}$ N horizontally. The normal reaction on the block is (Take $g = 10 \text{ m/s}^2$)



- (1) Zero (2) 2 N
(3) 1.5 N (4) $\sqrt{2}$ N
17. A motorcyclist is maintaining constant speed while going on an overbridge of radius R . When the motorcycle is ascending on the overbridge, the normal reaction on it
- (1) Increases
(2) Remains same
(3) Decreases
(4) Initially increases upto 45° with vertical and then decreases
18. An unbanked curve has a radius of 60 m. Coefficient of friction between the tyre of truck and road is 0.75. The distance between two front wheel of truck is 2 m. If the truck exceeds the speed of safe limit, then their
- (1) Inner wheels leave the ground first
(2) Outer wheels leave the ground first
(3) Both inner and outer wheels leave the ground together
(4) Truck cross the turn safely
19. A bucket full of water is tied with the help of a 2 m long string. The minimum angular velocity of bucket at the uppermost point so that water will not fall is
- (1) $2\sqrt{5}$ rad/s (2) $\sqrt{5}$ rad/s
(3) 5 rad/s (4) 10 rad/s

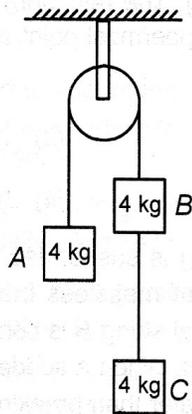
20. A mass of 4 kg is suspended as shown in figure with the help of massless inextensible string A. Another identical string B is connected at the lower end of the block. When a sudden pulling downward jerk slightly greater than breaking strength of A and B is given to string B, then



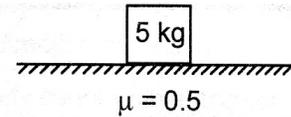
- (1) String A will break
(2) String B will break
(3) Both A and B will break simultaneously
(4) Both A and B will never break
21. A body of mass 0.5 kg experience a force $F = (2 + 3x^2)$ N where x (in metre) is the displacement from origin. It is released to move along x-axis from origin then its initial acceleration is
- (1) 2 m/s^2 (2) 10 m/s^2
(3) 4 m/s^2 (4) Zero
22. When a body of mass m raised by a string with an acceleration $a = g$ in upward direction, then tension in the string is
- (1) $2 mg$ (2) mg
(3) $\frac{mg}{2}$ (4) Zero
23. A sphere of mass 500 g starts moving with an acceleration of 10 m/s^2 , on application of an impulsive force. The force acts on it for 0.5 s. Gain in momentum of sphere is
- (1) 2.5 kg m/s (2) 5 kg m/s
(3) 0.05 kg m/s (4) 25 kg m/s

PART TEST-1_NEET

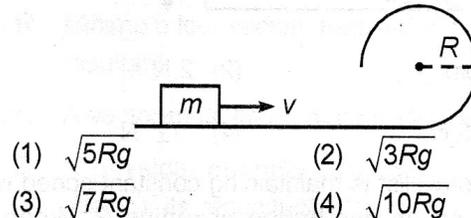
24. Three identical masses each of mass 4 kg are connected by massless inextensible strings. The string joining A and B passes over a massless frictionless pulley as shown in figure. The tension in the string connecting mass B and C is



- (1) 40 N (2) 20 N
 (3) 26.67 N (4) 13.33 N
25. Law of conservation of angular momentum is valid, when
- (1) Net force is zero and net torque is non-zero
 (2) Net force is non-zero and net torque is non-zero
 (3) Net force may or may not be zero and net torque is zero
 (4) Both force and torque must be zero
26. Two masses A and B of mass 4 kg and 1 kg respectively are connected with the help of massless inextensible string. Mass A is placed on a rough horizontal table and mass B is hanging with the help of string passing through a smooth hole at the centre of table. For the system to be in equilibrium what can be the minimum value of coefficient of friction?
- (1) 0.5 (2) 0.25
 (3) 2.5 (4) 0.125
27. A body is moving with the speed 20 m/s on a rough surface. If coefficient of friction is 0.5, then the distance after which velocity becomes zero is
- (1) 10 m (2) 20 m
 (3) 40 m (4) 80 m
28. A mass of 5 kg is placed on a horizontal rough surface. Coefficient of friction between body and surface is 0.5. The minimum horizontal force with which the block can just able to move is
 [Take $g = 10 \text{ m/s}^2$]



- (1) 25 N (2) $\sqrt{(50)^2 + (25)^2}$ N
 (3) 50 N (4) 22.5 N
29. A monkey slides down a rope. The breaking load for the rope is $\frac{5}{6}$ th of the weight of the monkey. The minimum acceleration with the monkey should slide so that the rope does not break, is
- (1) $\frac{5g}{6}$ (2) $\frac{g}{2}$
 (3) $\frac{g}{6}$ (4) $\frac{2g}{3}$
30. A block of mass m is moving with initial velocity v on horizontal frictionless surface. Find the minimum value of velocity v so that the block will complete the vertical circle



- (1) $\sqrt{5Rg}$ (2) $\sqrt{3Rg}$
 (3) $\sqrt{7Rg}$ (4) $\sqrt{10Rg}$
- SECTION-B**
31. A body of mass 5 kg is moving with a velocity of 10 m/s. Now a force which delivers a constant power of 75 watt is applied on it for 10 s in the same direction. The velocity of body after 10 s will be
- (1) $10\sqrt{2}$ m/s (2) 20 m/s
 (3) 40 m/s (4) $25\sqrt{2}$ m/s
32. When a body moves non-uniformly on a circular path
- (1) No work is done by tangential force
 (2) No work is done by centripetal force
 (3) Work done by tangential force is always positive
 (4) Work done by centripetal force is non-negative
33. A man standing near a well is supporting a bucket full of water with the help of a massless rope. The mass of bucket and water together is 20 kg. Length of rope in the well is 5 m. The amount of work done in pulling the bucket up onto the top of well is
- (1) 1000 J (2) 1125 J
 (3) 1062.5 J (4) 562.5 J

34. Two spring of spring constant k and $3k$ are stretched separately by same force. The ratio of potential energy stored in them respectively will be

- (1) 3 : 1 (2) 9 : 1
(3) 1 : 3 (4) 1 : 9

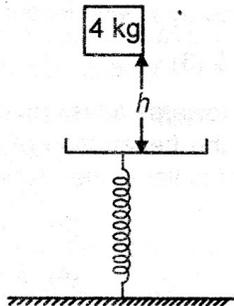
35. Two masses 100 g and 500 g are moving on a smooth surface with equal K.E. The ratio of their momenta is

- (1) 5 : 1 (2) $1 : \sqrt{5}$
(3) 1 : 5 (4) 25 : 1

36. A body of mass 0.5 kg thrown vertically upward with 20 m/s reaches a maximum height of 16 m. The amount of energy dissipated by the air drag acting on the ball during the ascent is

- (1) 20 J (2) 10 J
(3) 4 J (4) 8 J

37. A mass of 4 kg falls from a height h on the pan. Initially the spring is in its natural length and mass of spring and pan are negligible. Spring constant of the spring is 1000 N/m. Mass compresses the spring by 0.5 m. Then the height ' h ' is



- (1) 2.00 m (2) 1.56 m
(3) 4.0 m (4) 2.625 m

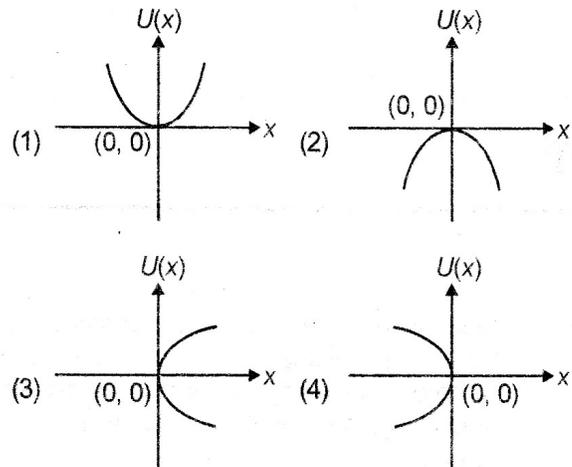
38. A motor pulls a block by giving a force of 50 N at a speed of 36 km/h. The power supplied by the motor to the block is

- (1) 500 watt
(2) 1800 watt
(3) 250 watt
(4) 200 watt

39. Human heart beats 72 times per minute. It pumps 1cc blood in each pulse under a pressure of 2×10^4 N/m². The power of heart is

- (1) 0.2 watt
(2) 0.02 watt
(3) 0.024 watt
(4) 2.2×10^{-1} watt

40. Force (F) acting on a particle kept at origin varies with position(x) as $F = kx$, where k is positive constant. If potential energy at origin $U(0)$ is zero, then graph between potential energy $U(x)$ versus x is



41. Mark the correct statement

- (1) Internal forces cannot increase the kinetic energy of a system
(2) Internal forces may increase the kinetic energy of a system
(3) Work done by kinetic friction always negative
(4) Both (2) & (3)

42. A bullet fired towards a wall reduces its half kinetic energy after the penetration of 6 cm. The further penetration of bullet in the block is

- (1) 2 cm (2) 1 cm
(3) 6 cm (4) 3 cm

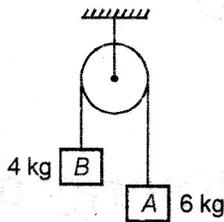
43. A body having initial kinetic energy 2 J collide with identical body at rest. The maximum loss of kinetic energy found in the collision is

- (1) 2 J
(2) Zero
(3) 1 J
(4) 1.5 J

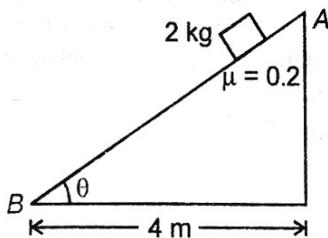
44. A particle is thrown at an acute angle with the horizontal. Select the **incorrect** statement.

- (1) Power delivered by gravity is zero at all the point on the trajectory
(2) Power delivered by gravity is zero only at one point.
(3) Average power of gravity is zero
(4) During one half journey, the power is negative and during the other half the power is positive

45. What is the work done by gravity on block A in 2 seconds after the blocks are released? (Pulley is light)

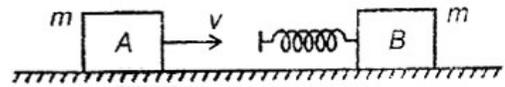


- (1) 240 J
 (2) 200 J
 (3) 120 J
 (4) 24 J
46. A 2 kg particle moves along x-axis such that its position (x) varies with time (t) as $x = 2t^2 + 3$. During the initial 5 seconds, the work done by all the forces acting on the particle is
- (1) 400 J
 (2) 500 J
 (3) 600 J
 (4) 900 J
47. A ball falls from height H and loses 36% of energy during impact with the ground. The height upto which the ball rises is
- (1) $0.64 H$ (2) $0.8 H$
 (3) $8.36 H$ (4) $0.5 H$
48. What is the work done by friction when the body slides down the inclined surface from A to B?



- (1) 32 J (2) 16 J
 (3) 8 J (4) Zero
49. Due to the force $\vec{F} = (4\hat{i} + 4\hat{j})$ N a body shifted from origin to the point (5 m, 6 m). The work done by the force is
- (1) 44 J (2) 22 J
 (3) 4 J (4) Zero

50. Block A moves on smooth surface and collides with the block B at rest. The maximum energy stored in the spring will be



- (1) $\frac{1}{8} mv^2$ (2) $\frac{1}{4} mv^2$
 (3) $\frac{1}{3} mv^2$ (4) $\frac{1}{2} mv^2$

CHEMISTRY

SECTION-A

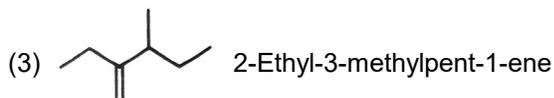
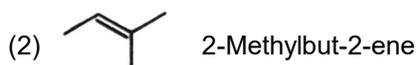
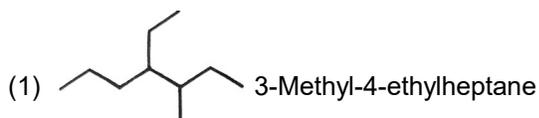
51. The compound which has one isopropyl group is

- (1) 2,2,3,3-Tetramethylpentane
- (2) 2,2-Dimethylpentane
- (3) 2,2,3-Trimethylpentane
- (4) 2-Methylpentane

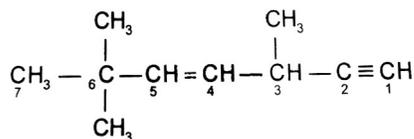
52. The compound which contains all the four $1^\circ, 2^\circ, 3^\circ, 4^\circ$ carbon atoms is

- (1) 3,3-Dimethylpentane
- (2) 2,3,4-Trimethylpentane
- (3) 2,3-Dimethylpentane
- (4) 3-Ethyl-2,3-dimethylpentane

53. Which one of the following is not correct IUPAC name?



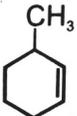
54. Find state of hybridisation of C_2, C_3, C_5 and C_6 in the given hydrocarbon in the sequence



- (1) sp^3, sp^2, sp^2 and sp
- (2) sp, sp^2, sp^2 and sp^3
- (3) sp, sp^2, sp^3 and sp^2
- (4) sp, sp^3, sp^2 and sp^3

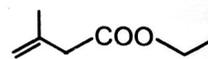
55. The IUPAC name of 

- (1) 3-formyl-1, 5-pentanedial
- (2) 2-aldo-pentane-1,5-dialdehyde
- (3) Propane-1, 2, 3-tricarbaldehyde
- (4) Propane trialdehyde

56. The IUPAC name of the  compound is

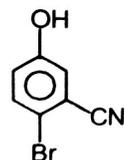
- (1) 3-Methylcyclohexene
- (2) 1-Methylcyclohex-2-ene
- (3) 6-Methylcyclohexene
- (4) 1-Methylcyclohex-5-ene

57. The IUPAC name of the given compound is

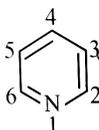


- (1) Ethylacrylate
- (2) Ethylmethylbutenoate
- (3) Ethylacetoethenoate
- (4) Ethyl-3-methylbut-3-enoate

58. IUPAC name of the following compound is

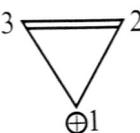


- (1) 4-bromo-3-cyanophenol
- (2) 2-bromo-5-hydroxybenzonitrile
- (3) 2-cyano-4-hydroxybromobenzene
- (4) 6-bromo-3-hydroxybenzonitrile

59. 

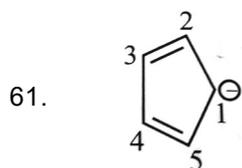
In pyridine electron density is maximum on

- (1) 2 and 6
- (2) 3 and 5
- (3) 4
- (4) 3 and 4

60. 

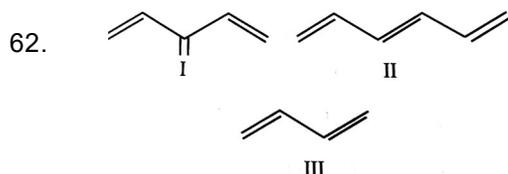
In this cation, π electron density is more on

- (1) C1
- (2) C2
- (3) C3
- (4) π -electron-density is same on each C-atom



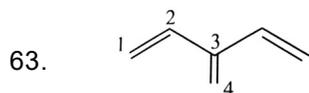
In this anion, π -electron-density is maximum on

- (1) C1 (2) C2 and C5
(3) C3 and C4 (4) same on each C-atom



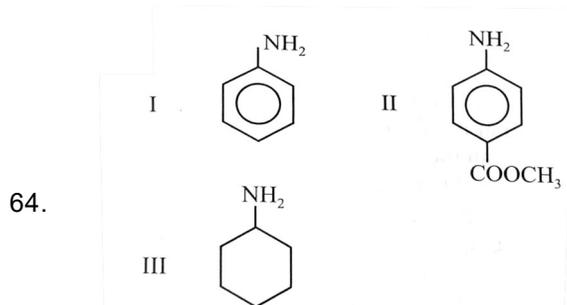
Among these compounds, the correct order of resonance energy is

- (1) I > II > III (2) II > I > III
(3) III > I > II (4) I > III > II



Which of the following statements is true about this molecule?

- (1) C1-C2 and C3-C4 bonds are of same length
(2) C1-C2 bond is shorter than C3-C4 bond
(3) C1-C2 bond is longer than C3-C4 bond
(4) C1-C2 and C2-C3 bonds are of same length

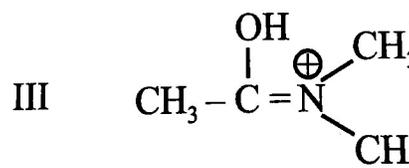
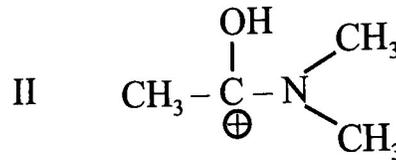
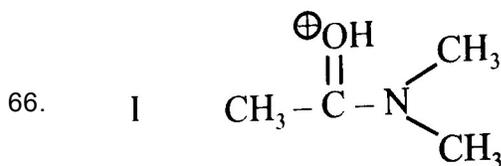


The correct order of C-N bond length among these compounds is

- (1) I > II > III (2) III > II > I
(3) III > I > II (4) II > I > III

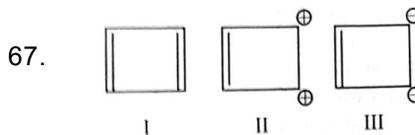
65. Which of the following species does not have all C-O bonds of same length?

- (1) HCOO^\ominus (2) CO_3^{2-}
(3) CO_3 (4) HCOOH



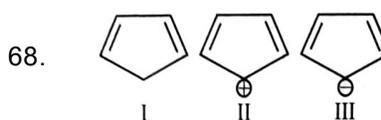
The stability order of these cononical structure is

- (1) I > II > III (2) III > I > II
(3) I > III > II (4) II > III > I



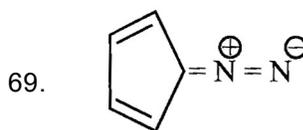
Which of these species is aromatic?

- (1) I only (2) II only
(3) III only (4) both II and III

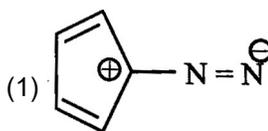


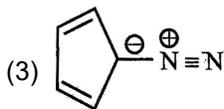
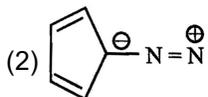
Which of these species is aromatic?

- (1) I (2) II
(3) III (4) all

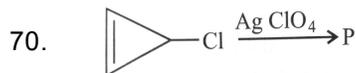


The most stable canonical structure of this molecule is





(4) All are equally stable



P will be



(3) mixture of (1) and (2)

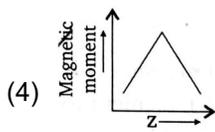
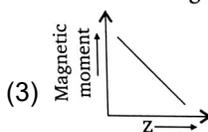
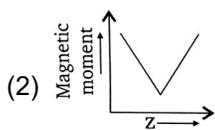
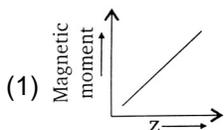
(4) none of these

71. The atomic numbers of the metallic and non-metallic elements which are liquid at room temperature respectively are

(1) 55, 87 (2) 33, 87

(3) 35, 80 (4) 80, 35

72. Which of the following graph is correct representation between atomic number (Z) and magnetic moment of d-block elements? [Outer electronic configuration: $(n-1)d^xns^{1 \text{ or } 2}$]



73. A compound contains three elements A, B and C. If the oxidation number of A = +2, B = +5 and C = -2, then possible formula of the compound is

(1) $A_3(B_4C)_2$ (2) $A_3(BC_4)_2$

(3) $A_2(BC_3)_2$ (4) ABC_2

74. An element with electronic configuration $[Xe]4f^{14}5d^76s^2$ is

(1) an alkaline earth metal

(2) a transition element

(3) an inert gas

(4) a rare earth element

75. The size of the species, Pb, Pb^{2+}, Pb^{4+} decreases as

(1) $Pb^{4+} > Pb^{2+} > Pb$ (2) $Pb > Pb^{2+} > Pb^{4+}$

(3) $Pb > Pb^{4+} > Pb^{2+}$ (4) $Pb^{4+} > Pb > Pb^{2+}$

76. If the difference in atomic size of $Na-Li = x, Rb - K = y, Fr - Cs = z$.

(1) $x = y = z$ (2) $x > y > z$

(3) $x < y < z$ (4) $x < y \ll z$

77. The set representing the correct order of ionic radius is

(1) $Li^+ > Be^{2+} > Na^+ > Mg^{2+}$

(2) $Na^+ > Li^+ > Mg^{2+} > Be^{2+}$

(3) $Li^+ > Na^+ > Mg^{2+} > Be^{2+}$

(4) $Mg^{2+} > Be^{2+} > Li^+ > Na^+$

78. The first, second and third ionisation energies (E_1, E_2 and E_3) for an element are 7 eV, 12.5 eV and 42.5 eV respectively. The most stable oxidation state of the element will be

(1) +1 (2) +4

(3) +3 (4) +2

79. Second ionization potential of Li, Be and B is in the order

(1) $Li > Be > B$ (2) $Li > B > Be$

(3) $Be > Li > B$ (4) $B > Be > Li$

80. The amount of energy released on the addition of an electron in outermost shell of an atom is called

(1) ionization enthalpy (2) hydration enthalpy

(3) electronegativity (4) electron gain enthalpy

SECTION-B

81. If the uncertainty in position, momentum, energy, time, angular momentum and angular displacement are $\Delta x, \Delta P, \Delta E, \Delta t, \Delta \phi$ and $\Delta \theta$ respectively. Which of the following is correct about Heisenberg's uncertainty principle?

(1) $(\Delta x)(\Delta P) \geq \frac{h}{4\pi}$ (2) $(\Delta E)(\Delta t) \geq \frac{h}{4\pi}$

(3) $(\Delta \phi)(\Delta \theta) \geq \frac{h}{4\pi}$ (4) All of these

82. If the velocity of an electron in a Bohr's orbit (n) of hydrogen is given by ' V ', then the value of n is equal to

- (1) $\frac{2\pi e^2 k}{V}$ (2) $\frac{2\pi e^2 k}{Vh}$
 (3) $\frac{Vhk}{2\pi e^2}$ (4) $\frac{\pi e^2 k}{2Vh}$

83. Choose the orbital having two nodal planes

- (1) p_y (2) p_x
 (3) d_{yz} (4) p_z

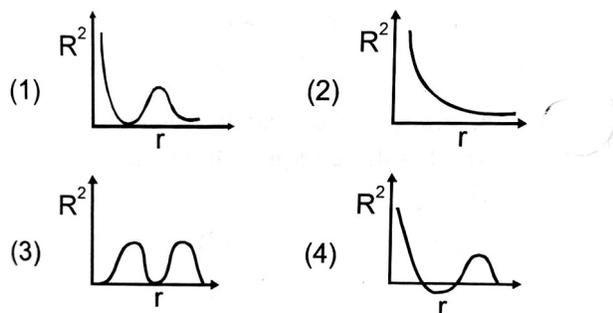
84. If the ionization energy of hydrogen atom is 160 eV, Find the shell having energy -40 eV.

- (1) $n = 1$ (2) $n = 2$
 (3) $n = 4$ (4) $n = 3$

85. If the angular momentum of an electron in a Bohr's orbit of the hydrogen atom is 3.164×10^{-34} kg m^2/s . The energy of the electron in the same orbit is

- (1) -3.4 eV (2) 3.4 eV
 (3) -1.5 eV (4) -13.6 eV

86. The probability distribution curve for 2s electron appears like



87. The total number of exchanges of electrons in d^6 system (degenerate orbitals) is

- (1) 7 (2) 8
 (3) 9 (4) 10

88. Potential energy of Be^{3+} electron is

- (1) $-\frac{e^2}{\pi\epsilon_0 r}$
 (2) $-\frac{3e^2}{4\pi\epsilon_0 r}$
 (3) $\frac{-e^2}{4\pi\epsilon_0 r}$
 (4) $\frac{3e^2}{4\pi\epsilon_0 r}$

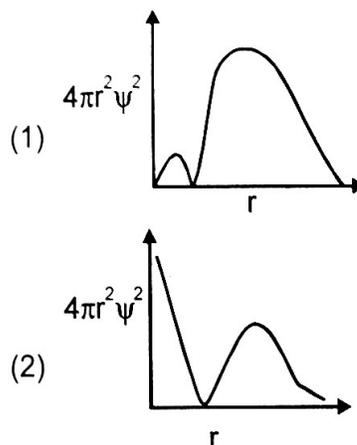
89. If threshold wavelength (λ_0) for ejection of electron from metal is 330 nm, then work function for the photoelectric emission is

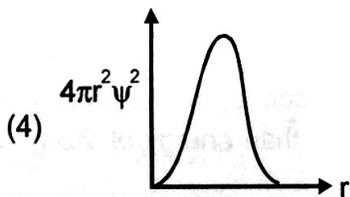
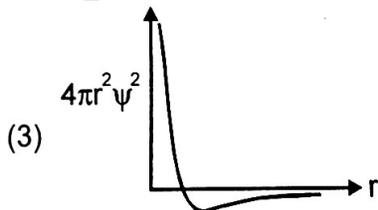
- (1) 1.2×10^{-18} J (2) 1.2×10^{-20} J
 (3) 6×10^{-19} J (4) 6×10^{-12} J

90. If the energy of an electron in 3rd Bohr orbit is $-E$, what is the energy of the electron in 2nd Bohr orbit?

- (1) $-2.25 E$ (2) $-9 E$
 (3) $-4.75 E$ (4) $-E$

91. Correct graph between radial probability distribution ($4\pi r^2 \Psi^2$) and radial distance (r) for 2s is shown by





92. The pair in which both species have equal magnetic moment is

- (1) Fe^{2+} , Mn^{2+} (2) Cu^{2+} , Ni^{2+}
 (3) Fe^{3+} , Ni^{2+} (4) Fe^{3+} , Mn^{2+}

93. Ψ_{420} denotes which of the following orbital?

- (1) 4s (2) $3d_{z^2}$
 (3) $4d_{z^2}$ (4) $4d_{x^2-y^2}$

94. Which of the following sets of quantum numbers represent the highest energy of subshell of an atom?

- (1) $n = 3, l = 1, m = 1, s = +\frac{1}{2}$
 (2) $n = 4, l = 0, m = 0, s = +\frac{1}{2}$
 (3) $n = 3, l = 0, m = 0, s = +\frac{1}{2}$
 (4) $n = 4, l = 2, m = -2, s = +\frac{1}{2}$

95. An ion Mn^{a+} has the magnetic moment equal to 4.9 B.M. The value of 'a' is

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

96. The maximum number of sub-shells, orbitals and electrons in N-shell of an atom are respectively

- (1) 4, 12, 32 (2) 4, 16, 30
 (3) 4, 16, 32 (4) 4, 32, 64

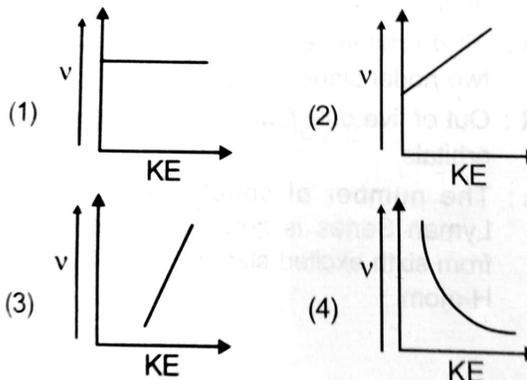
97. The energy required to dislodge electron from Li^{2+} is sufficient to ionize how many H-atoms?

- (1) 3 (2) 6
 (3) 9 (4) 12

98. The energy of an electron in the 3rd orbit of an atom (H) is $-E$. The energy of an electron in the first orbit will be

- (1) $-3E$ (2) $-\frac{E}{3}$
 (3) $-\frac{E}{9}$ (4) $-9E$

99. Which of the following graphs plotted between frequency of incident radiation and KE of photoelectrons is correct for photoelectric effect?



100. $|\Psi|^2$ at any point in an atom gives the value of

- (1) Radius of the orbital
 (2) Probability density of electron at that point
 (3) Total energy of the electron
 (4) Shape of the orbital

BOTANY

SECTION-A

101. The largest herbarium of the world is situated at
 (1) Royal Botanical Gardens, Kew, England
 (2) Meseum of Natural history, Paris
 (3) Indian Botanical Garden, Sibpur, Kolkata
 (4) National Botanical Gardens, Lucknow
102. Which of the following give comprehensive account of complete compilation of available information of any family or genus at a given time ?
 (1) Manuals (2) Monographs (3) Publications (4) All of these
103. The statement 'nothing lives forever, yet life continues' illustrates the role of
 (1) Embryogenesis (2) Morphogenesis
 (3) Replication (4) Reproduction
104. Which group of organisms are devoid of cell wall in their vegetative stage but develop a wall in reproductive phase
 (1) Fungi (2) Blue green algae
 (3) Slime mould (4) Archaeobacteria
105. Which one of the following organisms possesses characteristics of plant and an animal
 (1) *Euglena* (2) Bacteria
 (3) Mycoplasma (4) *Paramecium*
106. The protists in which cell size decreases with each division are
 (1) Dinoflagellates (2) Diatoms
 (3) Slime moulds (4) Radiolarians
107. Transformation experiment was first performed on which bacteria?
 (1) *E. coli* (2) *Streptococcus pneumoniae*
 (3) *Salmonella* (4) *Pasteurella pestis*.
108. The major component of bacterial cell wall is a polymer called
 (1) chitin (2) xylan
 (3) cellulose (4) peptidoglycan
109. Which of the following is an edible fungi?
 (1) *Mucor* (2) *Penicillium* (3) *Agaricus* (4) *Rhizopus*
110. Pleuro-pneumonia like organisms are grouped under
 (1) Prokaryotes (2) Eukaryotes (3) Fungi (4) Viruses
111. Mixotrophic nutrition occurs in
 (1) *Paramecium* (2) *Euglena* (3) *Plasmodium* (4) *Amoeba*
112. In which group of fungi, spores are flagellated?
 (1) Ascomycetes (2) Myxomycetes (3) Phycomycetes (4) Basidiomycetes
113. Read the name of different fungi given in the box:

Mucor, Albigo, Penicillium, Ustilago, Colletotrichum, Puccinia, Agaricus, Aspergillus and *Rhizopus*
 How many of these belong to the class Phycomycetes?

- (1) Three (2) Two (3) Four (4) Seven
114. The algal partner of the lichen thallus is known as
 (1) mycobiont (2) phycobiont (3) basidiobiont (4) lichenobiont

125. The scientific term for biological classification of categories is the

- (1) Species (2) Taxon (3) Phylum (4) Domain

126. Match the following columns and select the correct option.

Column I

- A. Panthera tigris
B. Mangifera indica
C. Musca domestica
D. Periplaneta americana
E. Rana tigrina

Column II

- (i) Mango
(ii) Common Indian frog
(iii) Cockroach
(iv) Tiger
(v) House fly

- (1) A-(ii), B-(v), C-(i), D-(iii), E-(iv)
(2) A-(iv), B-(i), C-(v), D-(iii), E-(ii)
(3) A-(ii), B-(v), C-(iii), D-(i), E-(iv)
(4) A-(iv), B-(i), C-(v), D-(ii), E-(iii)

127. Taxonomic hierarchy refers to

- (1) step-wise arrangement of all categories for classification of plants and animals
(2) a group of senior taxonomists, who decide the nomenclature of plants and animals
(3) a list of botanists or zoologists, who have worked on taxonomy of a species or group
(4) classification of a species based on fossil record

128. The most obvious & complicated feature of all living organisms is

- (1) The ability to sense their surroundings or environment and respond to these environmental stimuli
(2) Reproduction -sexual or asexual -for production of progeny of own kind.
(3) The ability to growth in size
(4) Presence of complex organs systems such as digestive and nervous system

129. Match each item in Column I with one in Column II and choose your answer from the codes given below:

	Column I		Column I
	Taxonomical Aid		Feature
I.	Flora	1.	Useful in providing information for identification of names of species found in an area
II.	Manuals	2.	Contains the actual account of habitat and distribution of plants of a given area.
III.	Monographs	3.	Contain information on any one taxon

- I II III
(1) 1 2 3
(2) 3 2 1
(3) 2 1 3
(4) 2 3 1

130. Which of the following groups of organisms have a protein rich layer called pellicle?

- (1) Chrysophytes (2) Euglenoids (3) Dinoflagellates (4) Slime moulds

SECTION-B

131. Protists obtain their food as

- (1) photosynthesisers (2) chemosynthesisers
(3) heterotrophs (4) Both (1) and (3)

132. Which one of the following is a characteristic feature of chrysophytes?

- (1) They are parasitic forms which cause diseases in animals
(2) They have a protein rich layer called pellicle
(3) They have indestructible wall layer deposited with silica
(4) They are commonly called dinoflagellates

133. The smut fungi is

- (1) *Puccinia* (2) *Agaricus* (3) *Ustilago* (4) *Colletotrichum*

134. Ergot of rye is caused by a species of

- (1) *Phytophthora* (2) *Ucinula* (3) *Ustilago* (4) *Claviceps*

135. An eukaryote, which causes disease comes under

- (1) moneran (2) fungus (3) virus (4) None of these

136. Which of the following shows coiled RNA strand and capsomeres?

- (1) Polio virus (2) Tobacco mosaic virus
(3) Measles virus (4) Retrovirus

137. Infectious proteins are present in

- (1) gemini viruses (2) prions (3) viroids (4) satellite viruses

138. Virus was discovered by whom?

- (1) Stanley (2) Ivanowaski (3) Herelle (4) Beijerinck

139. HIV is classified as a retrovirus because its genetic information is carried in

- (1) DNA instead of RNA (2) DNA
(3) RNA instead of DNA (4) Protein coat

140. The process which can not take place in the absence of virus is

- (1) transformation (2) conjugation
(3) translocation (4) transduction

141. Fungi usually store the reserve food material in the form of

- (1) Starch (2) Glycogen and oil (3) Lipid (4) Protein

142. Saprophytic protists are

- (1) Slime moulds (2) Dinoflagellates (3) Chrysophytes (4) Protozoans

143. Fungi resemble plants in

- (1) Lack of chloroplasts and heterotrophic nutrition
(2) Reproduction by only sexual means
(3) Having a cell wall and vacuoles
(4) Exhibition of bioluminescence

144. Consider the following regarding the reasons for the fact that now cyanobacteria are kept in Monera and not in Plantae
- I. They are prokaryotes
 - II. The cell wall of cyanobacteria has peptidoglycan
 - III. They can fix atmospheric nitrogen
- The correct explanations would be
- (1) I and II only (2) I and III only (3) II and III only (4) I, II and III
145. Methanogens belong to
- (1) eubacteria (2) archaebacteria (3) dinoflagellates (4) slime moulds
146. Cell wall is absent in
- (1) Aspergillus (2) Fundria (3) Mycoplasma (4) Nostoc
147. The imperfect fungi which are decomposers of litter and help in mineral cycling belong to
- (1) Deuteromycetes (2) Basidiomycetes
- (3) Phycomycetes (4) Ascomycetes
148. In which group of organisms the cells walls form two thin overlapping shells which fit together?
- (1) Chrysophytes (2) Euglenoids
- (3) Dinoflagellates (4) Slime moulds
149. Which is purely anaerobic?
- (1) Algae (2) Mosses (3) Fungi (4) None of these
150. Which of the following components provides sticky character to the bacterial cell?
- (1) Cell wall (2) Nuclear membrane
- (3) Plasma membrane (4) Glycocalyx

ZOOLOGY

SECTION-A

151. Choose the incorrect statement for the human alimentary canal :

- (a) The upper surface of the tongue has papillae, all of which bear taste buds
- (b) The short pharynx serves as a passage for food but not air
- (c) Oesophagus is a short thin tube which leads to stomach
- (d) More than one option mentioned above are incorrect

152. Read the following statements :

- (i) The lymphoid tissue of pharynx is called tonsils
- (ii) Wharton's duct is one of the salivary duct
- (iii) The hard surface of the teeth (enamel) helps in mastication of food
- (iv) Chewing is important as it increases the surface area of food
- (v) A bony flap called epiglottis prevents the entry of food into the glottis during swallowing

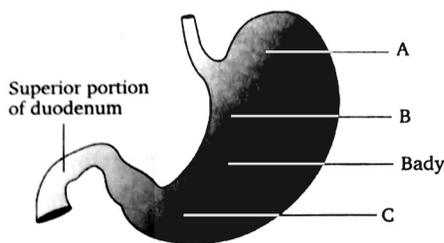
How many of the above statements are correct ?

- (a) Four
- (b) Three
- (c) Two
- (d) Five

153. In human tooth :

- (a) Enamel is secreted by ameloblast cell
- (b) Both root and crown are composed of dentine
- (c) Dentine is secreted by odontoblast cells
- (d) All of the above are correct

154. Identify the three major parts of the stomach labelled as A, B and C :



Options	A	B	C
(a)	Oesophagus opens into this part	Fundus	Pyloric
(b)	Pyloric	Cardiac	Fundus
(c)	Fundus	Oesophagus opens into this part	Pyloric
(d)	Fundus	Pyloric	Cardiac

155. Read the following statements :

- (i) Ascending colon is the largest part of colon which lack mesentry whereas transverse colon and descending colon are shorter
- (ii) Caecum possess few symbiotic micro-organisms in few herbivores
- (iii) Caecum opens into colon
- (iv) Rectum stores faecal matter temporarily
- (v) Herbivores have shorter intestine than carnivores as they digest cellulose

Which of the above statements are incorrect ?

- (a) (i), (v)
- (b) (ii), (iv)
- (c) (ii), (iii), (iv)
- (d) (iii), (iv), (v)

156. Arrange the layers of alimentary canal from inside to the outside sequentially :

- (a) Serosa → Muscularis → Submucosa → Mucosa
- (b) Mucosa → Sub-mucosa → Circular muscularis → Longitudinal muscularis
- (c) Submucosa → Muscularis → Mucosa → Serosa
- (d) Mucosa → Sub-mucosa → Longitudinal muscularis → Circular muscularis

157. Identify A, B, C and D from the table given below :

Salivary glands	Location	Duct through which it opens
A	At lower Jaw	Wharton's duct
Parotid gland	Near cheek	B
C	D	Rivinus duct

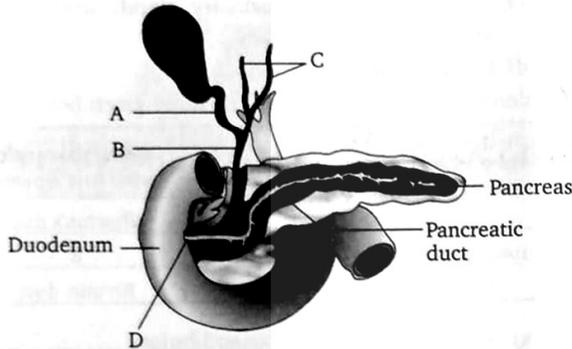
- (a) A = Submaxillary/submandibular, B = Stenson's duct, C = Sub-lingual, D = Below tongue
- (b) A = Sublingual, B = Stenson's duct, C = Submaxillary, D = Below tongue
- (c) A = Sublingual, B = Wharton's duct, C = Submandibular, D = Near cheek
- (d) A = Submaxillary, B = Stenson's duct, C = Sublingual, D = Above tongue

158. Hepatic lobules :

- (a) Are small divisions of liver defined at the histological scale

- (b) Lack connective tissue sheath
 (c) Are the structural and functional units of liver containing hepatic cells arranged in the form of cords
 (d) Both (a) and (c)

159. Identify the structures A, B, C and D of human digestive system :



Options	A	B	C	D
(a)	Duct from gall bladder	Hepatic duct	Duct from liver	Cystic duct
(b)	Duct from liver	Cystic duct	Hepato-pancreatic duct	Common bile duct
(c)	Cystic duct	Common bile duct	Ducts from liver	Hepato-pancreatic duct
(d)	Common bile duct	Cystic duct	Ducts from liver	Hepato-pancreatic duct

160. The opening of hepatopancreatic duct into duodenum is guarded by :

- (a) Cardiac sphincter (b) Pyloric sphincter
 (c) Boyden sphincter (d) Sphincter of Oddi

161. The worm-shaped structure connected to caecum :

- (a) Is the vermiform appendix
 (b) Serves as a haven for useful bacteria when illness flushes those bacteria from rest of the intestines
 (c) Is vestigial
 (d) Is related to more than one option given above

162. Ptyalin and lysozyme :

- (a) Are secreted by intestinal mucosa
 (b) Are absent in saliva
 (c) Hydrolyse starch and peptidoglycan respectively
 (d) Hydrolyse peptidoglycan and starch respectively

163. Brunner's gland :

- (a) Protects the duodenum from the acidic content of chyme
 (b) Provides an alkaline condition for the intestinal enzymes to be active
 (c) Lubricates intestinal walls
 (d) Performs all the above functions

164. After ingestion by humans, the first category of macromolecules to be chemically digested by the enzymes in the mouth is :

- (a) Protein (b) Lipids
 (c) Carbohydrate (d) Nucleic acids

165. Upon activation by stomach acidity, the secretions of the parietal cells :

- (a) Initiate the chemical digestion of lipids in the stomach
 (b) Delay digestion until the food arrive in the small intestine
 (c) Include pepsinogen
 (d) Initiate the digestion of protein in the stomach

166. Salivary amylase :

- (a) Hydrolyzes about 30% of starch into maltose
 (b) Is found in mammals like cows, lions and tigers including human beings
 (c) Functions at a pH of 7.5
 (d) Are secreted only by sublingual gland

167. Select the odd one w.r.t. the source of secretions :

- (a) Enterokinase
 (b) Chymotrypsinogen
 (c) Procarboxypeptidase
 (d) Nucleases

168. The pH of bile from liver is about _____ but from bile duct (gall bladder) it is about _____.

- (a) 8.6, 7.6 (b) 7.6, 7.6
 (c) 8.6, 8.6 (d) 9.6, 8.6

169. Secretin :

- (a) Stimulates bicarbonate secretion by pancreas
 (b) Inhibits acid secretion in stomach
 (c) Stimulates bile secretion
 (d) Performs all of the above functions

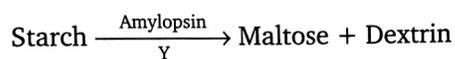
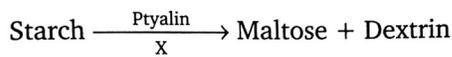
170. Succus entericus :

- (a) Is the secretion from crypts of Lieberkuhn only
- (b) Gets secreted in the oesophagus
- (c) Lacks lipases and nucleosidases
- (d) Is the secretion of goblet cells and crypts of Lieberkuhn

171. Identify the enzymes X, Y and Z :

- (i) Nucleotides \xrightarrow{X} Nucleosides \xrightarrow{Y}
Nitrogenous base + Pentose sugars
- (ii) Dipeptides \xrightarrow{Z} Amino acids
- (a) X = Nucleotidase, Y = Nucleosidase, Z = Dipeptidase
- (b) X = Nuclease, Y = Nucleotidase, Z = Dipeptidase
- (c) X = Nuclease, Y = Nucleosidase, Z = Pepsin
- (d) X = Nucleotidase, Y = Nuclease, Z = Trypsin

172. Identify the pH (X and Y) of the reactions shown below :



- (a) X = 6.8; Y = 7.1-8.3
- (b) X = 7.1-8.3; Y = 6.8
- (c) X = 7.1-8.3; Y = 8-11
- (d) X = 8-11; Y = 7.1-8.3

173. Which of the following is not a major activity of the stomach ?

- (a) Mechanical digestion
- (b) Nutrient absorption
- (c) Mucus secretion
- (d) Enzyme and HCl secretion

174. A fasting human whose energy needs exceed those provided in its diet draws on its stored resources in which order ?

- (a) Fat, then proein, then glycogen
- (b) Muscle glycogen, then fat, then liver glycogen
- (c) Liver glycogen, then muscle glycogen, then fat
- (d) Glycogen, then proetein, then fat

175. How many of the following acts at an alkaline pH ?

Amylopsin, Pepsin, Steapsin, Rennin, Gastric lipase, Lactase, Nuclease

- (a) 2
- (b) 7
- (c) 5
- (d) 4

176. The absorption of fats differs from that of carbohydrates in that the :

- (a) Fat absorption occurs in the stomach, whereas carbohydrates are absorbed from small intestine
- (b) Processing of fats does not require enzyme whereas processing of carbohydrate does
- (c) Most absorbed fats first enters the lymphatic system, whereas carbohydrates directly enter the blood
- (d) Fats need not be emulsified before they can be digested, whereas carbohydrates require

177. The undigested and unabsorbed substances called faeces :

- (a) Enters into the caecum of small intestine through ileo-caecal valve
- (b) Is temporarily stored in the rectum
- (c) Both (a) and (b)
- (d) Represents zero organic matter

178. Chyle is a :

- (a) Milky fluid consisting of lymph
- (b) Milky fluid containing lymph and emulsified fats or free fatty acids
- (c) Chylomicron only
- (d) Transparent fluid containing lymph without emulsified fat

179. Large intestine helps in the absorption of :

- (a) Glucose, fructose and fatty acids
- (b) Alcohol, glycerol and amino acids
- (c) Water, some drugs and minerals
- (d) Chylomicrons

180. Match the columns :

Column-I	Column-II
A. Jaundice	(i) Increased frequency of bowel movement
B. Diarrhoea	(ii) Faecal matter retention in rectum
C. Indigestion	(iii) Bile pigment deposition in eyes and skin
D. Constipation	(iv) Inadequate enzyme secretion

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

SECTION-B

181. Read the following statements :

- (i) The calorific values of carbohydrates, proteins and fats are 4.1 kcal/g, 5.65 kcal/g and 9.45 kcal/g respectively
- (ii) Beri-beri is caused by the deficiency of vitamin B₁
- (iii) Folic acid deficiency causes megaloblastic anaemia
- (iv) Indigestion is caused by anxiety, overeating, food poisoning and spicy food alongwith inadequate enzyme secretion
- (v) Rennin (chymosin) is present in gastric juice of human infants and calf and act on casein

How many of the above statements are correct ?

- (a) Three
- (b) Four
- (c) Two
- (d) Five

Intructions:

1. If both statements A and B are true and statement B is the correct explanation of statement A then mark (a)
 2. If both statements A and B are true but statement B is not the correct explanation of statement A then mark (b).
 3. If statement A is true but statement B is false, then mark (c).
 4. If both statements A and B are false statements then mark (d)
182. **A:** On prolonged chewing of boiled potato, it gives sweet taste.
B: Saliva has salivary amylase
183. **A:** Enzymes like trypsin are created in the form of trypsinogen in pancreas.
B: Pancreas secrete zymogens to prevent the enzymes from digesting the proteins in the cells in which they are synthesised.
184. **A:** Defaecation is an involuntary process and is carried by a mass peristaltic movement.
B: Fatty acids and glycerol being soluble can be absorded into blood.

185. Choose the wrong statement :

- (a) The exposed part of tooth forms crown
- (b) Bile acids are steroid acids
- (c) Enterokinase (enteropeptidase) directly act on food to digest them
- (d) HCl is required for the conversion of pepsinogen into pepsin

186. Choose the correct option for the usual flow of bile.

- I. Hepatopancreatic ampulla
 - II. Cystic duct
 - III. Liver
 - IV. Gall bladder
 - V. Hepatic ducts
 - VI. Duodenum
 - VII. Common bile duct
- (a) III → V → II → IV → I → VII → VI
 - (b) III → IV → V → VI → VII → I → II
 - (c) III → V → IV → VII → II → I → VI
 - (d) III → V → IV → II → VII → I → VI

187. Trypsin differs from pepsin in that :

- (a) Trypsin digests protein in an alkaline medium while pepsin does so in an acidic medium
- (b) Trypsin is secreted from the gastric glands while pepsin is secreted from the pancreas
- (c) Trypsin digests protein in an acidic medium while pepsin does so in an alkaline medium
- (d) Trypsin digests fat and pepsin digests protein

188. Which one of the following pairs of the kind of cells and their secretion is correctly matched ?

- (a) **Oxyntic cells** – A secretion with pH between 2.0 and 3.0
- (b) **Alpha cells of Islets of Langerhans** – Secretion that decreases blood sugar level
- (c) **Kupffer cells** – A digestive enzymes that hydrolyses nucleic acids
- (d) **Sebaceous glands** – A secretion that evaporates for cooling.

189. What will happen if the secretion of parietal cells of gastric glands is blocked with an inhibitor?

- (a) In the absence of HCl secretion, inactive pepsinogen is not converted into the active enzyme pepsin
- (b) Enterokinase will not be released from the duodenal mucosa and so trypsinogen is not converted to trypsin
- (c) Gastric juice will be deficient in chymosin
- (d) Gastric juice will be deficient in pepsin

190. When breast feeding is replaced by less nutritive food low in proteins and calories the infants below the age of one year are likely to suffer from

- (a) Pellagra
- (b) Marasmus
- (c) Rickets
- (d) Kwashiorkor

191. Anxiety and eating spicy food together in an otherwise normal human, may lead to:

- (a) Diarrhoea
- (b) Vomiting
- (c) Indigestion
- (d) Jaundice

PART TEST-1_NEET

192. The initial step in the digestion of milk in humans is carried out by?
- (a) Lipase (b) Trypsin
(c) Rennin (d) Pepsin
193. Fructose is absorbed into the blood through mucosa cells of intestine by the process called:
- (a) Active transport
(b) Facilitated transport
(c) Simple diffusion
(d) Co-transport mechanism
194. Gastric juice of infants contains :
- (a) Nuclease, pepsinogen, lipase
(b) Pepsinogen, lipase, rennin
(c) Amylase, rennin, pepsinogen
(d) Maltase, rennin, pepsinogen
195. Which cells of "Crypts of Lieberkuhn" secrete antibacterial lysozyme ?
- (a) Paneth cells (b) Zymogen cells
(c) Kupffer cells (d) Argentaffin cells
196. Good vision depends on adequate intake of carotene rich food :
- Select the best option from the following statements :
- I. Vitamin-A derivatives are formed from carotene
II. The photopigments are embedded in the membrane discs of the inner segment
III. Retinal is a derivative of vitamin-A
IV. Retinal is a light absorbing part of all visual photopigments
- Options :
- (a) I, III, IV (b) II, III
(c) II, III, IV (d) I, II
197. Which of the following options best represents the enzyme composition of pancreatic juice ?
- (a) Amylase, pepsin, trypsinogen, maltase
(b) Peptidase, amylase, pepsin, rennin
(c) Lipase, amylase, trypsinogen, procarboxypeptidase
(d) Amylase, peptidase, trypsinogen, rennin
198. A baby boy aged two years is admitted to play school and passes through a dental check-up. The dentist observed that the boy had twenty teeth. Which teeth were absent?
- (a) Canines (b) pre-molars
(c) Molars (d) Incisors
199. Identify the correct statement with reference to human digestive system :
- (a) Serosa is the innermost layer of the alimentary canal
(b) Ileum is a highly coiled part
(c) Vermiform appendix arises from duodenum
(d) Ileum opens into small intestine
200. The enzyme enterokinase helps in conversion of :
- (a) Trypsinogen into trypsin
(b) Caseinogen into casein
(c) Pepsinogen into pepsin
(d) Protein into polypeptides