Aakash
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MM : 720

REVISION TEST SERIES

Time : 3 Hrs. 20 Min.

(*for* NEET-2022)

Test – 8

Topics covered :

Physics : Physical World, Units and Measurements Motion in a Straight Line, Motion in a Plane, Laws of Motion, Work, Energy and Power System of Particles and Rotational Motion.

Chemistry : States of Matter: Gases and Liquids, Thermodynamics, Equilibrium, Redox Reactions, Some Basic Concepts of Chemistry, Structure of Atom, Classification of Elements and Periodicity in Properties, Chemical Bonding and Molecular Structures.

Botany : Plant Kingdom, Anatomy of Flowering Plants, Morphology of Flowering Plants, Biological Classification, The Living World, Cell Cycle and Cell Division, Cell: The Unit of Life.

Zoology : Excretory Products and their Elimination, Body Fluids and Circulation, Breathing and Exchange of Gases, Digestion and Absorption, Biomolecules, Structural Organisation in Animals– Animal Tissues.

Instructions :

(i) 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.

(ii) Each question carries 4 marks. For every wrong response 1 mark shall be deducted from the total score. Unanswered / unattempted questions will be given no marks.

(iii) Use blue/black ballpoint pen only to darken the appropriate circle.

(iv) Mark should be dark and completely fill the circle.

(v) Dark only one circle for each entry.

(vi) Dark the circle in the space provided only.

(vii) Rough work must not be done on the Answer sheet and do not use white-fluid or any other rubbing material on the Answer sheet.

PHYSICS

Choose the correct answer:

SECTION-A

1. Dimensional formula for Planck's constant is

   (1) $[M\, L^2\, T^{-1}]$
   (2) $[M^{-1}\, L^2\, T^{-3}]$

   (3) $[M^{-1}\, L\, T^{-2}]$
   (4) $[M^{-2}\, L^3\, T^{-1}]$

2. A potential difference of $V = (20.0 \pm 0.1)$ volt is applied across a resistance $R = (80.0 \pm 0.2)$ ohm. The maximum percentage error in measurement of current will be

   (1) 0.75%
   (2) 0.5%

   (3) 0.25%
   (4) 1%

3. Choose the correct statement(s).

   (1) Gravitational force is a central force

   (2) Electrostatic force is a central force

   (3) Nuclear force is a central force

   (4) Both (1) and (2)

4. A body covers a distance of 5 m along a semicircular path. The ratio of distance covered to displacement is

(1) $\dfrac{11}{7}$ (2) $\dfrac{12}{5}$

(3) $\dfrac{8}{3}$ (4) $\dfrac{7}{5}$

5. A ball of mass m is dropped from the top of tower of suitable height. The ratio of distance covered by the ball is first 3 s to the next 3 s is

(1) 1 : 2 (2) 1 : 3

(3) 1 : 1 (4) 1 : 4

6. The velocity-time (v-t) graph for a particle moving along x-axis is shown in the figure. The acceleration at t = 4.5 s is
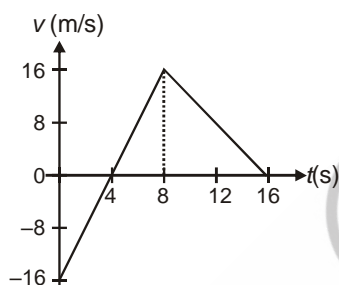
(1) 2 m/s² (2) 4 m/s²

(3) 8 m/s² (4) 6 m/s²

7. A particle initially at rest moves along x-axis. Its acceleration-time equation is given as $a = (6t + 5)$ m/s². If it starts from origin, then the average velocity from t = 0 to t = 2 second is

(1) 9.0 m/s (2) 7.5 m/s

(3) 8.5 m/s (4) 9.5 m/s

8. A particle is projected in x-y plane with initial velocity $(3\hat{i} + 2\hat{j})$ m/s, then velocity of particle after 2 s, if it moves under the acceleration of $(\hat{i} - \hat{j})$ m/s² is

(1) $5\hat{i}$ m/s (2) $(5\hat{i} + \hat{j})$ m/s

(3) $2\hat{i}$ m/s (4) $(5\hat{i} - \hat{j})$ m/s

9. A man is moving on a straight horizontal road with velocity 5 km/h. Rain is falling vertically with velocity 5 km/h. The relative velocity of rain w.r.t. man is

(1) 10 km/h (2) $5\sqrt{2}$ km/h

(3) $5\sqrt{5}$ km/h (4) Zero

10. A particle moves in the x-y plane from origin having instantaneous velocity $\vec{v} = 2\hat{i} + 4x\hat{j}$. The equation of path is

(1) $y = \dfrac{x^2}{2}$ (2) $y = 2x^2$

(3) $y = 4x^2$ (4) $y = x^2$

11. Two vectors $\vec{A} = \hat{i} + 2\hat{j} + \hat{k}$ and $\vec{B} = 4\hat{i} + \hat{j} + 2\hat{k}$ are given. The unit vector along the vector $(\vec{A} - \vec{B})$ is

(1) $\dfrac{-3\hat{i} + \hat{j} - \hat{k}}{\sqrt{11}}$ (2) $\dfrac{3\hat{i} - \hat{j} - \hat{k}}{\sqrt{11}}$

(3) $\dfrac{-3\hat{i} + \hat{j} - \hat{k}}{3}$ (4) $\dfrac{3\hat{i} - \hat{j} - \hat{k}}{3}$

12. A balloon is going vertically upwards with a velocity of 12 m/s. It releases a packet when it is at height of 65 m from the ground. The time taken by packet to reach ground is

(1) 5 s (2) 6 s

(3) 7 s (4) 8 s

13. A body sliding down from rest on a smooth inclined plane slides down $\dfrac{1}{4}^{th}$ distance in 2 s. It will slide the complete plane in

(1) 4 s (2) 6 s

(3) 5 s (4) 3 s

14. The resultant of two forces acting at an angle 150° is 10 N and is perpendicular to one of the force. The other force is

(1) $20\sqrt{3}$ N (2) $10\sqrt{3}$ N
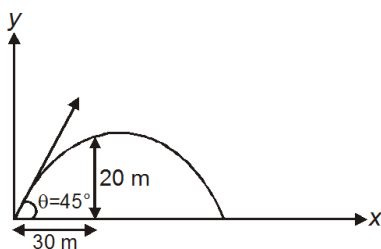
(3) 20 N (4) $20\sqrt{5}$ N

15. The ratio of the angular speed of second hand and minute hand of a watch is

(1) 1 : 12 (2) 60 : 1

(3) 12 : 1 (4) 1 : 60

16. For ground to ground projectile motion the angle between instantaneous velocity vector and acceleration vector at highest point of its motion is
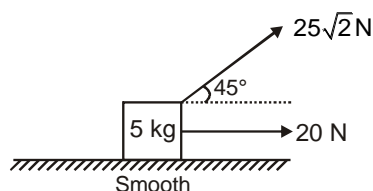
(1) $\dfrac{\pi}{3}$ (2) $\dfrac{\pi}{6}$

(3) $\dfrac{\pi}{4}$ (4) $\dfrac{\pi}{2}$

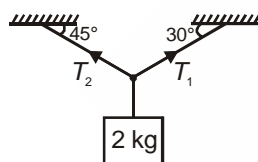17. In the given figure, the horizontal range of projectile is

   (1) 40 m
   (2) 90 m
   (3) 60 m
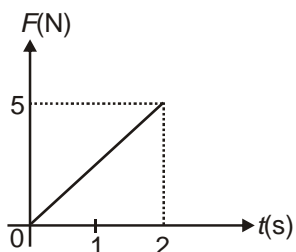   (4) 70 m

18. The acceleration of the given block is

   (1) 3 m/s^2
   (2) 9 m/s^2
   (3) 4 m/s^2
   (4) 5 m/s^2

19. The ratio of tensions T_2 to T_1 in rope is (If ropes are massless)

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

20. A body of mass 1 kg is acted on by a force (F) which varies with time (t) as shown in the graph given below. The momentum acquired by the body in 2 s, if it starts from rest is

   (1) 2.5 N s
   (2) 10 N s
   (3) 1 N s
   (4) 5 N s

21. A 3 kg block is resting on a truck moving with an acceleration of 2 m/s^2 on a horizontal road. Force of friction on the block is
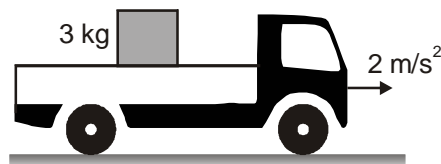
   (1) Zero
   (2) 4 N
   (3) 6 N
   (4) 8 N

22. When a horse starts suddenly, the rider falls backward due to inertia of

   (1) Rest
   (2) Direction
   (3) Motion
   (4) Both (2) and (3)

23. A bullet of mass 10 g is fired from a gun, the bullet moves with velocity 200 m/s. If the mass of the gun is 500 g, then the recoil velocity of the gun is

   (1) 2 m/s
   (2) 20 m/s
   (3) 12 m/s
   (4) 4 m/s

24. On a circular horizontal road of radius R and coefficient of friction μ, the maximum linear speed for safe turning of vehicles to avoid skidding will be

   (1) $\sqrt{\mu gR}$
   (2) $\sqrt{\mu g/R}$
   (3) $\sqrt{R/g\mu}$
   (4) $\sqrt{\mu R/g}$

25. A particle of mass 1 kg is moving in a circular path with constant speed 5 m/s. The magnitude of centripetal force acting on the particle is (radius of circular path is 5 m)

   (1) 5 N
   (2) 10 N
   (3) 15 N
   (4) Zero

26. Select correct statement regarding stable equilibrium.

   (1) Potential energy of body is minimum in stable equilibrium position
   (2) Slope of potential energy versus position graph is zero at stable equilibrium
   (3) A restoring force acts on the body when it is slightly displaced from its stable equilibrium position
   (4) All of these

27. In a conservative field, the potential energy U as a function of position x is given by $U = x^2$. Then the corresponding conservative force is given by

(1) x

(2) $2x$

(3) $-x$

(4) $-2x$

28. A body of mass 2 kg is placed on a rough horizontal surface as shown in figure. If a force of 15 N is applied on the body such that body moves 5 m towards right, then work done by frictional force is (g = 10 m/s^2)
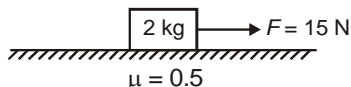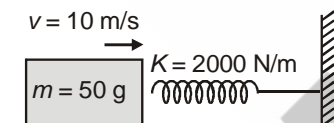

(1) -50 J

(2) 50 J

(3) Zero

(4) -25 J

29. Work done by a force $\vec{F} = y\hat{i} + x\hat{j}$ in displacing a body from a point A(1 m, 2 m, $-$ 3 m) to another point B(2 m, -1 m, 4 m) will be

(1) $-$ 3 Joule

(2) 4 Joule

(3) $-$ 4 Joule

(4) Zero

30. A block of mass 50 g moving with a speed of 10 m/s strikes a spring of force constant 2000 N/m. The maximum compression in the spring is

(1) 2.5 cm

(2) 10 cm

(3) 5 cm

(4) Zero

31. A block of mass m is kept over another bigger block of mass $2m$ and the system rests on a smooth horizontal surface. The coefficient of friction between the blocks is 0.50. Find the work done by the force of friction on the smaller block by the bigger block during a displacement d of the system, when a horizontal force mg is applied to the lower block.

(1) $\dfrac{mgd}{3}$

(2) mgd

(3) $\dfrac{mgd}{2}$

(4) Zero

32. A chain is placed on a frictionless table with one fourth of its length hanging over the edge. If length of the chain is 4 m and its mass is 8 kg, then the work needed to slowly pull it back to the table is

(1) 30 J

(2) 20 J

(3) 10 J

(4) 5.0 J

33. A driver in the car moving on a turn of radius of curvature 4 m with speed 4 m s^{-1} applies brakes which produces tangential retardation of 3 m s^{-2}. Net acceleration of car in turning at this instant is

(1) 4 m s^{-2}

(2) 5 m s^{-2}

(3) 6 m s^{-2}

(4) 7 m s^{-2}

34. A fan is rotating with a speed of 360 rev/minute. It comes to rest in 6 s, on switching off the switch. The number of revolution made by it before coming to rest is

(1) 9

(2) 27

(3) 18

(4) 36

35. The velocities of three particles of masses 20 g, 30 g and 50 g are $10\hat{i}$ m/s, $10\hat{j}$ m/s, $10\hat{k}$ m/s respectively. The velocity of the centre of mass of the three particle is

(1) $10(\hat{i} + \hat{j} + \hat{k})$ m/s

(2) $2\hat{i} + 3\hat{j} + 5\hat{k}$ m/s

(3) $20\hat{i} + 30\hat{j} + 5\hat{k}$ m/s

(4) $20\hat{i} + 30\hat{j} + 50\hat{k}$ m/s

SECTION-B

36. A ball hits a horizontal floor with a vertical speed 20 m/s. If coefficient of restitution is 0.5, then maximum height attained by the ball after collision is

(1) 20 m

(2) 15 m

(3) 10 m

(4) 5 m

37. If a mass m collides elastically with another identical mass at rest in oblique manner, then after collision both the masses moves (w.r.t. one another) at an angle of

(1) 30°

(2) 45°

(3) 60°

(4) 90°

38. Three forces of magnitude F, F and $\sqrt{2}F$ are acting on the periphery of a disc of mass m and radius R as shown in the figure. The net torque about the centre of the disc is
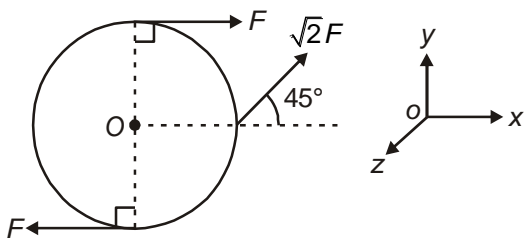
(1) $FR\hat{k}$
(2) $-FR\hat{k}$
(3) $3FR\hat{k}$
(4) $-3FR\hat{k}$

39. Two identical rings are moving with equal kinetic energy. One ring rolls without slipping and other ring is in pure translational motion. The ratio of their respective speeds of centre of mass is

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

40. A disc of mass m and radius R is rolling without slipping as shown in the figure. The magnitude of net velocity of the point P is ($OP = R/2$)
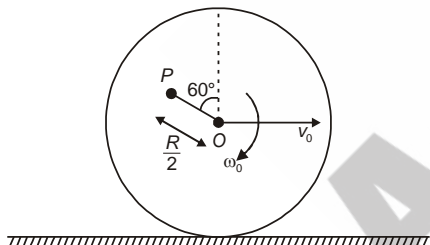
(1) $R\omega_0$
(2) $\dfrac{\sqrt{5}}{2}R\omega_0$
(3) $\dfrac{\sqrt{7}}{2}R\omega_0$
(4) $\dfrac{\sqrt{3}}{2}R\omega_0$

41. If a moving particle have linear momentum $\vec{P}$ and position vector $\vec{r}$, then choose the correct relation between $\vec{r}$, $\vec{P}$ and angular momentum $\vec{L}$ of particle about the origin.

(1) $\vec{r}\cdot\vec{L}=0$
(2) $|\vec{r}\times\vec{L}|=0$
(3) $\vec{L}\cdot\vec{P}\neq 0$
(4) $|\vec{L}\times\vec{P}|=0$

42. A wheel initially at rest, starts rotating with a uniform angular acceleration. The wheel rotates through an angle θ_1 in first second and through an additional angle θ_2 in next two second. The value of $\dfrac{\theta_2}{\theta_1}$ is

(1) 8
(2) 4
(3) $\dfrac{1}{4}$
(4) $\dfrac{1}{8}$

43. Moment of inertia of a ring about its diametric axis is I. Two such rings are welded as shown in figure. The new moment of inertia about XX' axis is
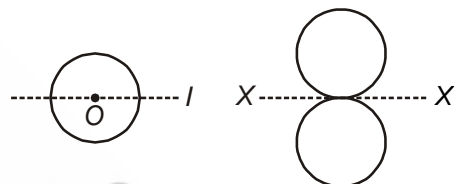
(1) $6I$
(2) $3I$
(3) $2I$
(4) $\dfrac{I}{2}$

44. If the angular momentum of a body varies with time (t) as $L = (2t^3 + 3t^2 + 4t + 7)$ kg m^2 s^{-1}, then torque acting on the body at $t = 1$ second is

(1) 40 N m
(2) 16 N m
(3) 23 N m
(4) 12 N m

45. For the structure shown in figure, moment of inertia about an axis passing through yy' is
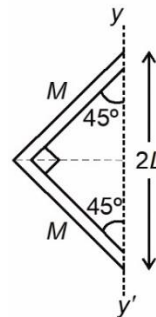
(1) $\dfrac{2ML^2}{3}$
(2) $\dfrac{ML^2}{3}$
(3) $\dfrac{8ML^2}{3}$
(4) $\dfrac{4ML^2}{3}$

46. When a sphere purely rolls down an inclined plane, then identify the correct statement related to the work done by friction force.

    (1) The friction force does positive translational work

    (2) The friction force does negative rotational work

    (3) The net work done by friction is zero

    (4) Positive, negative or zero depends on inclination of plane

47. A ring of mass m and radius R is melted and then moulded in a sphere. The moment of inertia of the sphere about its main axis will become

    (1) Less than that of ring about its main axis

    (2) Greater than that of ring about its main axis

    (3) Equal to than that of ring about its main axis

    (4) None of these

48. A force $\vec{F} = -5\hat{i} + 2\hat{j} - 5\hat{k}$ acts on particle whose position vector is $\vec{r} = \hat{i} + 2\hat{j} - \hat{k}$. Torque of the force about origin will be

    (1) $5\hat{i} - 10\hat{j} + 8\hat{k}$

    (2) $-8\hat{i} + 10\hat{j} + 12\hat{k}$

    (3) $5\hat{i} - 10\hat{j} - 8\hat{k}$

    (4) $8\hat{i} - 10\hat{j} - 12\hat{k}$

49. A particle is moving along a straight line parallel to x-axis with constant velocity. Its angular momentum about the origin

    (1) Increases with time

    (2) Decreases with time

    (3) Remains constant

    (4) Is zero

50. If the earth were to suddenly contract to $\left(\dfrac{1}{n}\right)$th of its present radius without any change in its mass, then the duration of the new day (in hours) will be

    (1) $\dfrac{24}{n}$ (2) $24n^2$

    (3) $\dfrac{24}{n^2}$ (4) $24n$

CHEMISTRY

SECTION-A

51. Sulphur exists in three different allotropic forms like S_2, S_6 and S_8 etc. If equal weight of three are taken in separate container, then the ratio of number of atoms is

    (1) 1 : 3 : 4   (2) 2 : 4 : 3

    (3) 1 : 1 : 1   (4) 1 : 1 : 4

52. For the given reaction,

    $P_4 + 3O_2 \longrightarrow P_4O_6$

    If 62 g of P_4 is reacted with excess of oxygen, the percentage yield is 80%, then the amount of product formed is

    (1) 42.6 g   (2) 110 g

    (3) 88 g   (4) 28.4 g

53. If equivalent weight of a metal oxide is 24 then, the equivalent weight of its chloride will be

    (1) 15.5   (2) 51.5

    (3) 35.5   (4) 71

54. The volume of $O_2(g)$ at STP required for the complete combustion of 7 g $C_2H_4(g)$ is

    (1) 16.8 litres   (2) 28 litres

    (3) 22.4 litres   (4) 5.6 litres

55. The number of oxygen atoms present in 90 g of water is

    (1) N_A (2) $5N_A$

    (3) $2.5N_A$ (4) $10N_A$

56. 27 g of N_2O_x occupies 5.6 litres at STP. Assuming ideal gas nature, the value of x is

    (1) 1   (2) 3

    (3) 5   (4) 4

57. Order of ionic size for the ions, N^{3-}, O^{2-}, Na^+ and Mg^{2+} is

    (1) $N^{3-} > O^{2-} > Na^+ > Mg^{2+}$

    (2) $Mg^{2+} > Na^+ > O^{2-} > N^{3-}$

    (3) $O^{2-} > N^{3-} > Mg^{2+} > Na^+$

    (4) $Na^+ > Mg^{2+} > N^{3-} > O^{2-}$

58. The Halogen having the highest value of electron affinity is

    (1) Chlorine   (2) fluorine

    (3) Bromine   (4) Iodine

59. Which among the following is an amphoteric oxide?

    (1) MgO   (2) Cl_2O_7

    (3) CO_2 (4) Al_2O_3

60. s-block elements together with p-block elements are called

    (1) Transition elements

    (2) Inner transition elements

    (3) Representative elements

    (4) Transuranium elements

61. Most electropositive element among the following is

    (1) Be   (2) Mg

    (3) Na   (4) Li

62. The correct order of IE is

    (1) F > N > O > C > B > Be > Li

    (2) F > N > O > C > Be > B > Li

    (3) F > O > N > C > Be > B > Li

    (4) N > F > O > C > Be > Li > B

63. Maximum number of electrons in an atom having quantum numbers n = 3, $s = +\dfrac{1}{2}$ is

    (1) 6   (2) 5

    (3) 3   (4) 9

64. Which one of the following set of quantum number represents the lowest energy of an electron in a multi electron atom?

    (1) n = 4; l = 0; m = + 0; s = $+\dfrac{1}{2}$

    (2) n = 3; l = 1; m = + 1; s = $+\dfrac{1}{2}$

    (3) n = 4; l = 2; m = 0; s = $-\dfrac{1}{2}$

    (4) n = 3; l = 2; m = –1; s = $-\dfrac{1}{2}$

65. If the longest wavelength in Balmer series of He^+ is $\dfrac{9x}{5}$ cm then the shortest wavelength of H-atom in Lyman series is

    (1) $\dfrac{x}{4}$ cm   (2) $\dfrac{x}{2}$ cm

    (3) $\dfrac{5x}{3}$ cm   (4) x cm

66. Total number of nodes (angular and radial) present in 4p orbital is

    (1) 2   (2) 6

    (3) 4   (4) 3

67. If in a sample of hydrogen atoms, electron jump from 4th excited state to ground state, then the number of lines obtained in UV region will be

    (1) 10   (2) 6

    (3) 4   (4) 3

68. The work function of a metal is 10.0 eV. The longest wavelength of light that can cause photoelectron emission from this metal is approximately

    (1) 248 nm   (2) 124 nm

    (3) 400 nm   (4) 110 nm

69. Heisenberg's uncertainty principle

    (1) Supports the circular path of electron in an atom

    (2) Can be significantly applied to macroscopic bodies

    (3) Is given as $\Delta x.\Delta p \geq \dfrac{h}{4\pi}$

    (4) Confirms the particle nature of an electron

70. Which of the following set has $\Delta_f H° = 0$?

    (1) P_4(white), O_3(g), Cl_2(g)

    (2) I_2(s), P_4(white), Br_2(l)

    (3) I_2(s), $CaCO_3$(s), H_2O(l)

    (4) O_2(g), Br_2 (l), P(black)

71. Consider the bond energies (in kJ mol^{-1}): B.E. (N − N) = x, B.E.(H − H) = y, BE (N–H) = z, $\Delta_r H°$ of the reaction (in kJ mol^{-1})

    $$\frac{1}{2} N_2H_4(g) + \frac{1}{2} H_2(g) \longrightarrow NH_3(g), \text{ will be}$$

    (1) x – 2z – y   (2) $\dfrac{x}{2} - \dfrac{y}{2} - z$

    (3) $\dfrac{x}{2} + \dfrac{y}{2} - z$ (4) $\dfrac{x}{2} - \dfrac{y}{2} + z$

72. Dipole-dipole interactions are present in which of the following pairs?

    (1) H_2O and H_2

    (2) HCl and H_2O

    (3) He and Ne

    (4) HCl and He

73. Which of the following has highest heat of neutralization?

    (1) $H_2SO_4 + KOH$ (2) $NaOH + HF$

    (3) $CH_3COOH + NaOH$ (4) $HCl + NaOH$

74. Which of the following is incorrect for isothermal reversible expansion of an ideal gas?

    (1) $\Delta H = 0$ (2) $\Delta U = 0$

    (3) $\Delta T = 0$ (4) $W = 0$

75. For the reaction, $A(g) + B_2(g) \longrightarrow AB_2(g)$

    $\Delta S = 120\ JK^{-1}\ mol^{-1}$, $\Delta H = 55\ kJ/mol$ respectively. Reaction will be spontaneous at

    (1) 450 K   (2) 505 K

    (3) 405 K   (4) 420 K

76. A system on absorbing heat of 1500 cal does work equivalent to 2500 cal by expanding against atmospheric pressure. The change in internal energy of the system is

    (1) −5000 cal   (2) +5000 cal

    (3) −1000 cal   (4) +1000 cal

77. The extensive property among the following is

    (1) Density   (2) Pressure

    (3) Viscosity   (4) Enthalpy

78. Rate of diffusion of gas X is $\dfrac{1}{2}$ that of gas Y. If the molecular mass of gas X is 64 u then the molecular mass of gas Y under similar condition is

    (1) 1284 u   (2) 324 u

    (3) 4 u   (4) 16 u

79. If the critical temperature of a gas is 300 K, then its Boyle's temperature will be

    (1) 1012.5 K   (2) 1250 K

    (3) 1350 K   (4) 1400.5 K

80. The gas having highest critical temperature is

    (1) CO_2 (2) NH_3

    (3) He   (4) H_2

81. Consider the following graph for a given mass of gas
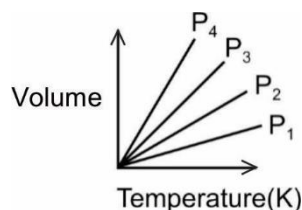
    The correct relation between P_1, P_2, P_3 and P_4 is

    (1) $P_4 > P_3 > P_2 > P_1$ (2) $P_1 > P_2 > P_3 > P_4$

    (3) $P_3 > P_2 > P_1 > P_4$ (4) $P_1 > P_2 > P_4 > P_3$

82. Which among the following has highest boiling point?

    (1) Ethanol   (2) Acetone

    (3) Diethyl ether   (4) Pentane

83. Unit of van der Waals constant b is

    (1) $mol^{-2}L$ (2) $L\ mol^{-1}$

    (3) $mol\ L^{-1}$ (4) $L^{-1}mol^2$

84. HOMO (Highest Occupied Molecular Orbital) of the molecule of N_2 will be

    (1) $\pi 2p_x$ (2) $\sigma^* 2p_z$

    (3) $\pi^* 2p_x$ (4) $\sigma 2p_z$

85. Shape of $N(SiH_3)_3$ and $N(CH_3)_3$ will be respectively

    (1) Planar, pyramidal

    (2) Pyramidal, planar

    (3) Planar, Planar

    (4) Pyramidal, pyramidal

SECTION-B

86. Hybridization of Xe in $XeOF_4$ is

    (1) sp^3 (2) sp^3d^2

    (3) sp^3d^3 (4) sp^3d

87. In which of the following pairs both the species are diamagnetic?

    (1) B_2 and NO^+ (2) C_2 and O_2

    (3) F_2 and O_2 (4) C_2 and F_2

88. Decreasing order of dipole moment of the given molecules is

    (1) $CH_2Cl_2 > CHCl_3 > CH_3Cl$

    (2) $CHCl_3 > CH_3Cl > CH_2Cl_2$

    (3) $CH_3Cl > CH_2Cl_2 > CHCl_3$

    (4) $CHCl_3 > CH_2Cl_2 > CH_3Cl$

89. Shape of SF_4 molecule is

    (1) See-Saw   (2) Square Planar

    (3) Tetrahedral   (4) Pyramidal

90. Which of the following species does not exist?

    (1) H_2 (2) He_2

    (3) F_2 (4) He_2^+

91. Which of the following would cause forward shift in the given reaction at equilibrium?

    $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$; $\Delta H = -x$ kJ

    (1) Increase of temperature

    (2) Decrease of pressure

    (3) Addition of inert gas at constant pressure

    (4) Addition of HCl gas

92. Solubility of $Al(OH)_3$ in decimolar KOH solution is (K_{sp} of $Al(OH)_3 = 1.90 \times 10^{-33}$)

    (1) 1.90×10^{-32} M   (2) 1.90×10^{-30} M

    (3) 1.48×10^{-8} M   (4) 1.48×10^{-30} M

93. At 300 K, the value of $\left(\dfrac{K_c}{K_p}\right)$ will be lowest for

    (1) $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$

    (2) $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$

    (3) $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$

    (4) $2HI(g) \rightleftharpoons H_2(g) + I_2(g)$

94. pH of 0.05 M aqueous solution of weak acid HA ($K_a = 4 \times 10^{-4}$) is

    (1) 4.70   (2) 2.35

    (3) 3.39   (4) 1.30

95. Which of the following is an acidic buffer?

    (1) HBr + KBr   (2) $H_3PO_4 + NaH_2PO_4$

    (3) $NH_4OH + NH_4Cl$ (4) NaOH + NaCl

96. Ammonium carbamate decomposes as

    $NH_2COONH_4(s) \rightleftharpoons 2NH_3(g) + CO_2(g)$

    For this reaction, $K_P = 108 \times 10^{-6}$ atm^3. If we start with 1 mole of the ammonium carbamate, then the total pressure at equilibrium would be

    (1) 0.058 atm   (2) 0.048 atm

    (3) 0.09 atm   (4) 0.03 atm

97. For the redox reaction,

    $xMnO_4^- + yC_2O_4^{2-} + zH^+ \rightarrow aMn^{+2} + bCO_2 + cH_2O$

    The correct option is

    (1) x = 2, z = 16, b = 10

    (2) x = 8, z = 1, b = 10

    (3) x = 2, z = 5, b = 8

    (4) x = 1, z = 3, b = 9

98. Which of the following is a redox reaction?

    (1) $SO_2 + H_2O \rightarrow H_2SO_3$

    (2) $CaC_2O_4 + 2HCl \rightarrow CaCl_2 + H_2C_2O_4$

    (3) $2CuSO_4 + 4KI \rightarrow Cu_2I_2 + 2K_2SO_4 + I_2$

    (4) $Cu^{2+} + 4NH_3 \rightarrow [Cu(NH_3)_4]^{2+}$

99. The compound which cannot disproportionate among the following is

    (1) H_2O_2 (2) SO_2

    (3) HNO_2 (4) $HClO_4$

100. Mole of $FeSO_4$ required to be oxidised by one mole of $K_2Cr_2O_7$ in acidic medium is

    (1) 1   (2) $\dfrac{1}{2}$

    (3) 6   (4) $\dfrac{1}{6}$

BOTANY

SECTION-A

101. Select the feature which is **not** true for the outermost layer of bacterial cell envelope.

    (1) It is made up of mucous or polysaccharide macromolecules

    (2) It protects the cell from loss of water and nutrients

    (3) It helps in adhesion

    (4) Its thickness and chemical composition are same in all bacterial cells

102. Non-membrane bound organelle(s) found in prokaryotic cells are

    (1) Ribosomes   (2) Centrioles

    (3) Plastids   (4) Both (1) and (2)

103. Centrioles are

    (1) Surrounded by amorphous pericentriolar materials

    (2) Bounded by single membrane

    (3) Made up of eleven evenly spaced fibrils of tubulin

    (4) Absent in algae

104. Consider the following statements and select the **correct** option for statement A and B.

    A. Chromosome has one extremely short and one very long arm.

    B. Nucleolus has a site for active synthesis.

	A	B
(1)	Sub-metacentric	rRNA
(2)	Telocentric	t-RNA
(3)	Acrocentric	rRNA
(4)	Metacentric	m-RNA

105. The plasmid DNA

    (1) Acts as genomic DNA

    (2) Is double stranded and linear

    (3) Is found in prokaryotes

    (4) Is found inside the nucleoid

106. Place for storing, preservation and exhibition of both plants and animals is

    (1) Herbarium

    (2) Botanical garden

    (3) Museum

    (4) Zoological park

107. Choose **correct** scientific name printed according to binomial nomenclature

    (1) Mangifera *indica* Linn

    (2) *Panthera* leo L

    (3) *Homo* Sapiens Linn

    (4) *Triticum aestivum* Linn

108. Amongst the given taxonomic aids, how many is/are associated with *ex-situ* conservation of organisms?

    > Museum, Key, Botanical garden, Herbarium, Zoological park

    (1) One   (2) Two

    (3) Three   (4) Four

109. Human cells in culture, divide once in approximately every 24 hours. During this

    (1) Interphase lasts for 1 hour

    (2) Completion of G_1, S and G_2 phases takes more than 22 hours

    (3) S phase takes more than 95% of the duration

    (4) M-phase takes 50% of the total time

110. Select the **incorrect** statement w.r.t. the G_0-phase of the cells cycle

    (1) Cells in G_0 phase do not proliferate

    (2) It is also called quiescent stage

    (3) Cells in G_0 phase remain metabolically inactive

    (4) Heart cells exist in this phase

111. The most dramatic period of the cell cycle is

    (1) S-phase   (2) M-phase

    (3) G_2-phase   (4) G_1-phase

112. Select the **correct** option w.r.t. the following figure
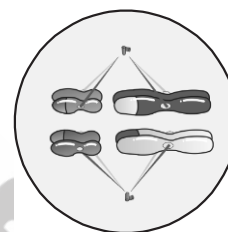
    (1) It represents metaphase of mitosis

    (2) Bivalents align on the equatorial plate

    (3) It shows the end of anaphase-I of meiosis

    (4) Shows cytokinesis to form dyad of cells

113. Which of the following type of microbe are present in the gut of several ruminant animals and produce biogas which is also a potent greenhouse gas from the dung of these animals?

    (1) Eubacteria   (2) Methanogens

    (3) Mycoplasma   (4) Halophiles

114. Consider the following

    > *Nostoc*, *Mycoplasma*, *Euglena*, Diatoms

    How many organism(s) given in the box, lack cell wall?

    (1) One   (2) Two

    (3) Three   (4) Four

115. Select the odd match w.r.t. kingdom Monera

    (1) Photosynthetic autoprophs: Blue green algae

    (2) Chemosynthetic autoprophs: Recycling of nutrients

    (3) Comma shaped bacterium: *Vibrio*

    (4) Heterotrophic bacteria: Use inorganic substance to produce ATP

116. Consider the following statements (A-C). Choose the **correct** option to fill the blanks.

    A.   (i)   is the causative organism of dysentery.

    B. Spores of slime moulds are dispersed by   (ii) .

    C. Chrysophytes includes   (iii)   and   (iv) .

    (1) (i) *Paramoecium*   (ii) Water

    (2) (iii) Euglenoids   (iv) Golden algae

    (3) (ii) Air   (iii) Diatoms

    (4) (i) *Entamoeba*   (iv) Dinoflagellates

117. Match the columns and select the correct option

Column-I	Column-II
a. Sporozoans	(i) Planktons
b. Euglenoids	(ii) Marshy areas
c. Methanogens	(iii) *Plasmodium*
d. Diatoms	(iv) Pellicle

    (1) a(iii), b(iv), c(ii), d(i)   (2) a(iii), b(ii), c(iv), d(i)

    (3) a(ii), b(iii), c(i), d(iv)   (4) a(i), b(ii), c(iii), d(iv)

118. Region of maturation in a tap root

    (1) Is situated proximal to elongation zone towards root cap

    (2) Undergoes rapid cells elongation and enlargement

    (3) Gives rise to unicellular root hairs from some of its epidermal cells

    (4) Is made up of small, thin-walled dead cells

119. All are adventitious roots that provide extra mechanical support to the plants, **except**

    (a) Stilt root   (b) Prop root

    (c) Pneumatophores

    (1) (b) only   (2) (a) only

    (3) Both (a) and (b)   (4) (c) only

120. Lateral branches originating from the basal and underground portion of the main stem that grow beneath the soil and then come out obliquely upward giving rise to leafy shoots are

    (1) Stolon

    (2) Sucker

    (3) Offset

    (4) Runner

121. The given aestivation is   (i)   and found in   (ii) .

    Here (i) and (ii) are respectively

    (1) Twisted and China rose

    (2) Vexillary and Pea

    (3) Valvate and *Calotropis*

    (4) Imbricate and Gulmohur

122. In which of the following plants, the margin of thalamus grows further upward completely enclosing the ovary and getting fused with it and bears the sepals, petals and stamens above the ovary?

    (1) China rose and Plum

    (2) Peach and Rose

    (3) Cucumber and Guava

    (4) Sunflower and Mustard

123. Which of the following statements are **incorrect**?

    a. Casparian strips are present in the endodermis cells of dicot stem.

    b. Radial vascular bundles are present in dicot root.

    c. Vascular cambium is present in dicot as well as in monocot stems.

    (1) a and b only

    (2) b and c only

    (3) a and c only

    (4) All a, b and c

124. Vessels differ from tracheids in being

    (1) A single long cell

    (2) Composed of row of cells with dissolved intervening walls

    (3) Elongated cells with tapering ends

    (4) Dead lignified structure

125. a. Bulliform cells

    b. Presence of cuticle

    c. Stomata are present on adaxial and abaxial epidermis in equal proportion

    d. Bean-shaped guard cells

    Which of the above feature(s) belong(s) to dorsiventral leaves?

    (1) Only d   (2) a and c

    (3) b and c   (4) b and d

126. Choose the **incorrect** match w.r.t. elements of phloem and their features.

(1)	Sieve tube element	-	Lacks nucleus at maturity
(2)	Companion cells	-	Maintain pressure gradient in sieve tubes
(3)	Phloem parenchyma	-	Storage of resins, latex and mucilage
(4)	Phloem fibres	-	Generally absent in secondary phloem

127. Select **incorrect** statement w.r.t. stem.

    (1) Develops from plumule

    (2) Possess nodes and internodes

    (3) Performs photosynthesis even in underground condition

    (4) Is generally green when young

128. How many of the following structures of maize seed is/are triploid?

    a. Scutellum   b. Coleoptile

    c. Aleurone layer   d. Coleorhiza

    e. Plumule   f. Endosperm

    (1) One

    (2) Three

    (3) Two

    (4) Four

129. The homologous structures are

    (1) Tendrils of watermelon and tendrils of pea

    (2) Thorns of *Citrus* and spines of *Opuntia*

    (3) Phylloclade of *Euphorbia* and phyllode of Australian *Acacia*

    (4) Tendrils of pumpkin and thorns of *Bougainvillea*

130. Secondary medullary rays are

    (1) Narrow band of collenchyma which passes through secondary xylem and secondary phloem

    (2) Developed due to redifferentiation

    (3) Developed from cambium and translocate only water in radial direction

    (4) Made up of dedifferetiated cells

131. _____ uses the chemical constituents of plants to resolve confusions in classification.

    (1) Cytotaxonomy   (2) Karyotaxonomy

    (3) Numerical taxonomy (4) Chemotaxonomy

132. The multicellular female gametophyte is retained within the megasporangium. This statement holds **true** for

    (1) *Marchantia*   (2) *Fucus*

    (3) *Equisetum*   (4) *Cedrus*

133. Unicellular algae commonly used by space travellers as protein supplements are

    (1) *Chlorella* and *Laminaria*

    (2) *Ulva* and *Chara*

    (3) *Spirulina* and *Chlorella*

    (4) *Porphyra* and *Gelidium*

134. Choose the **incorrect** statements for pteridophytes.

    (1) Include horsetails and ferns

    (2) Sporophylls aggregate to form strobili in all the members

    (3) Can bear small or large leaves

    (4) Can be used for medicinal purposes and prevent soil erosion

135. Read the following features

    | Green, Diploid, Multicellular, Asexual bud, Haploid |

    Out of the above features how many are **correct** for gemmae?

    (1) 4   (2) 3

    (3) 5   (4) 2

SECTION-B

136. Complete the following analogy

    Triticum : Poales : : *Musca* : _____

    (1) Muscidae   (2) Diptera

    (3) Insecta   (4) Arthropoda

137. Mitochondria and chloroplast are similar in all of the following aspects, **except**

    (1) Presence of circular ds-DNA

    (2) Are double membrane bound

    (3) Sites of carbohydrate biosynthesis

    (4) Divide by fission

138. How many of the following features are associated with the endomembrane system?

    Synthesis of steroidal hormones; Glycosylation, Suicidal bags; Storage of proteins; Synthesis of ATP; Formation of glycolipids

    (1) Four   (2) Three

    (3) Five   (4) Two

139. Select the **odd** one w.r.t ribosomes

    (1) They are ribonucleoprotein particles

    (2) Composed of DNA and proteins

    (3) Not surrounded by any membrane

    (4) Prokaryotic ribosomes are of 70S type

140. Select the **correct** statement w.r.t. interkinesis

    (1) Chromosomes reach the extremely extended state

    (2) It is exactly same like the interphase before mitosis

    (3) Centriole duplication takes place

    (4) DNA replicates during this state

141. In which of the following stages of cell division recombinase enzyme is required?

    (1) Anaphase-I   (2) Anaphase-II

    (3) Mitotic Anaphase   (4) Prophase-I

142. In some organisms, karyokinesis is not followed by cytokinesis, which results in the formation of a

    (1) Haploid cell   (2) Syncytium

    (3) Diploid cell   (4) Uninucleate cell

143. Among the stages of mitotic cell division, which is the best stage to study the shapes of chromosomes?

    (1) Metaphase

    (2) Prophase

    (3) Anaphase

    (4) Telophase

144. The homologous chromosomes separate during

    (1) Prophase-I   (2) Metaphase-I

    (3) Anaphase-I   (4) Anaphase-II

145. How many of the given organisms have coenocytic mycelium?

    Bracket fungi, *Neurospora*, Smut fungi, *Trichoderma*, *Albugo*, *Alternaria, Mucor*, Mushroom

    (1) Five   (2) Three

    (3) Four   (4) Two

146. Mark the **correct** statement w.r.t. viruses

    (1) Viruses are facultative parasites

    (2) Cell wall is outer covering

    (3) Cause mumps, small pox, herpes.

    (4) A virus contains both DNA and RNA

147. Select the **mismatched** pair.

    (1) Turmeric   –   Rhizome

    (2) Lily   –   Bulb

    (3) *Gladiolus*   –   Corm

    (4) *Colchicum*   –   Tuber

148. Select the **incorrect** statement.

    (1) Spring wood has large number of xylary elements

    (2) Late wood has broad lumen in vessels

    (3) Autumn wood is darker and has higher density

    (4) Early wood is formed due to high activity of cambium

149. Gymnosperms and pteridophytes are similar in

    (1) Having diploid gametophyte

    (2) Having gametophyte as their dominant plant body

    (3) Having heterotrophic mode of nutrition

    (4) Having sporophytic dominant plant body

150. Gametes bear two laterally attached flagella in all the given, **except**

    (1) *Ectocarpus*

    (2) *Dictyota*

    (3) *Laminaria*

    (4) *Porphyra*

ZOOLOGY

SECTION-A

151. Select the correct statement for epithelial tissue.

    (1) Cells are compactly packed with large amounts of intercellular matrix.

    (2) A free surface is present which faces either a body fluid or the outside environment.

    (3) The tissue provides a protective covering or lining for all parts of the body.

    (4) The cells are always loosely packed with little intercellular matrix.

152. Match the following columns and choose the **correct** answer.

	Column-I (Type of epithelium)		Column-II (Location of epithelium)
a.	Simple squamous epithelium	(i)	PCT, DCT
b.	Simple cuboidal epithelium	(ii)	Air sacs of lungs
c.	Simple ciliated epithelium	(iii)	Stomach, intestine
d.	Simple columnar epithelium	(iv)	Bronchioles, fallopian tubes

    (1) a(ii), b(i), c(iii), d(iv)

    (2) a(i), b(ii), c(iii), d(iv)

    (3) a(ii), b(i), c(iv), d(iii)

    (4) a(iv), b(iii), c(i), d(ii)

153. Epithelium which has limited role in secretion and absorption is

    (1) Simple cuboidal and columnar epithelium

    (2) Only simple cuboidal epithelium

    (3) Compound epithelium

    (4) Only simple columnar epithelium

154. Select the **incorrect** statement from the following.

    (1) Columnar or cuboidal cells that are specialised for secretion constitute glandular epithelium

    (2) Exocrine glands secrete mucus, saliva, milk insulin, enzymes, etc.

    (3) Goblet cells are unicellular glands while salivary glands are multicellular glands

    (4) Adhering junctions perform cementing to keep neighbouring cells together

155. Choose the **correct** option which includes connective tissue only.

    (1) Cartilage, Bone, Salivary gland, Blood

    (2) Tendon, Ligament, Areolar tissue, Blood

    (3) Ligament, Biceps, Goblet cells, Tendon

    (4) Muscles, Pancreas, Liver, Bone

156. Various parts of human respiratory system are given in the box.

    > Trachea, Alveoli, Primary bronchi, Initial bronchioles, Secondary bronchi, Tertiary bronchi

    How many structures from the above are supported by incomplete 'C'-shaped cartilaginous rings?

    (1) Four

    (2) Five

    (3) Six

    (4) Three

157. Read the following enzyme catalysed chemical reaction of respiration.

    $$CO_2 + H_2O \xrightleftharpoons{\text{'X'}} H_2CO_3 \xrightleftharpoons{\text{'X'}} HCO_3^- + H^+$$
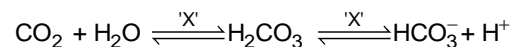
    Select the **incorrect** statement about enzyme 'X'.

    (1) The concentration of enzyme 'X' is higher in RBCs than in blood plasma

    (2) The name of enzyme 'X' is carbonic anhydrase

    (3) Enzyme 'X' helps in maximum transport of CO_2 from tissues to alveoli as carbamino-haemoglobin

    (4) Zinc is a co-factor for enzyme 'X'

158. In an adult healthy individual, average cardiac output is around _____ L/min.

    (1) 2

    (2) 3

    (3) 5

    (4) 7

159. Which of the following is correct w.r.t. oxygen-hemoglobin dissociation curve where 'X' represents oxygenated blood curve and 'Y' represents deoxygenated blood curve?
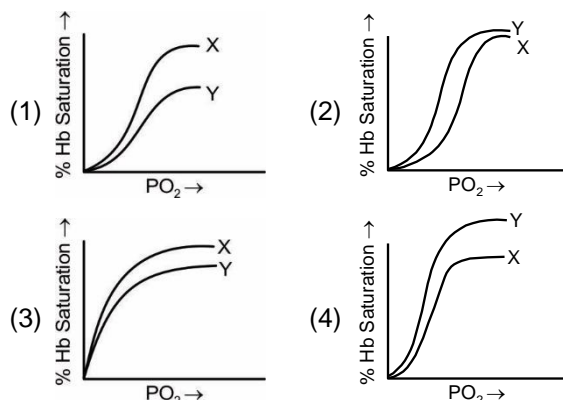
160. The partial pressure of oxygen in the alveoli of the lungs is
    (1) Less than that in the arterial blood
    (2) More than that in the arterial blood
    (3) Equal to that in the venous blood
    (4) Less than that in the tissue

161. Blood clotting disorder, leading to excessive loss of blood from the body, can be due to reduction in the number of
    (1) Monocytes   (2) Erythrocytes
    (3) Thrombocytes   (4) Neutrophils

162. Following are the two statements given about the circulatory system.
    a. Damage to chordae tendineae of the tricuspid valve will immediately decrease the blood flow to aorta.
    b. The opening of left atrium of heart into left ventricle is guarded by bicuspid valve.
    Choose the **correct** option.
    (1) Both statements a and b are correct
    (2) Statement a is correct and b is incorrect
    (3) Statement b is correct and a is incorrect
    (4) Both statements a and b are incorrect

163. Condition, **not** associated with asthma is
    (1) Difficulty in breathing causing wheezing sound
    (2) Spasm of smooth muscles present in the wall of the bronchioles
    (3) Breakdown of alveolar septa which decreases the respiratory surface
    (4) Swelling and redness of bronchi and bronchioles

164. Choose the **correct** statement about joint diastole.
    a. Almost 70% of ventricular filling takes place.
    b. Its duration is about 0.4 seconds in a single cardiac cycle.
    c. Lub sound in heart is produced during this phase.
    d. Semilunar valves are closed.
    e. It indirectly represents P-wave of ECG.
    (1) a and c
    (2) a, b and d
    (3) a, d and e
    (4) c and e

165. How many of the organisms listed in the box below have open circulatory system?

Nereis, Crabs, *Herdmania, Balanoglossus,* Earthworm, Squid, Snail, Cockroach, *Amphioxus*

    (1) 6   (2) 5
    (3) 4   (4) 7

166. Which of the following parts of human brain controls the reflex action that leads to the ejection of stomach contents through the mouth?
    (1) Spinal cord
    (2) Pons
    (3) Medulla oblongata
    (4) Cerebral cortex

167. The secretion of pancreatic enzymes and bicarbonate ions into pancreatic juice is stimulated respectively by
    (1) Gastrin and insulin
    (2) Angiotensin and epinephrine
    (3) Cholecystokinin and secretin
    (4) Insulin and glucagon

168. Which of the following is the **correct** option that indicates increasing order of pH of digestive juices?
    (1) Gastric juice, Saliva, Pancreatic juice
    (2) Saliva, Gastric juice, Pancreatic juice
    (3) Pancreatic juice, Saliva, Gastric juice,
    (4) Pancreatic juice, Gastric juice, Saliva

169. Read the following statements with respect to digestive system.

    a. In humans, three pairs of salivary glands are situated just outside the buccal cavity and secrete saliva into the buccal cavity.

    b. The bile duct and pancreatic duct open together into jejunum.

    c. The stomach is lined by brush border epithelium

    d. Renin is a proteolytic enzyme found in gastric juice of infants which helps in digestion of milk protein.

    How many statements from the above is/are **correct**?

    (1) Four　　　　　　　(2) Three

    (3) Two　　　　　　　(4) One

170. Which among the following is true for sphincter of Oddi?

    (1) Guards the opening of common bile duct into pancreatic duct

    (2) Present at the junction of midgut and hindgut

    (3) Present between the pyloric part of stomach and duodenum

    (4) Guards the opening of hepato-pancreatic duct into duodenum

171. Destruction of which of the following cells of gastric mucosal glands may lead to anemia?

    (1) Parietal cells　　　　(2) Peptic cells

    (3) Chief cells　　　　　(4) Zymogen cells

172. A cartilaginous flap which prevents the entry of food into the opening of the wind pipe is called

    (1) Glottis　　　　　　(2) Gullet

    (3) Epiglottis　　　　　(4) Pyloric sphincter

173. Which of the following is an inactive enzyme of pancreatic juice?

    (1) Pepsinogen　　　　(2) Chymotrypsinogen

    (3) Carboxypeptidase　　(4) Enterokinase

174. Succus entericus contains a variety of enzymes, **except**

    (1) Maltase　　　　　　(2) Sucrase

    (3) Nuclease　　　　　(4) Dipeptidase

175. The abnormal frequency of bowel movement and increased liquidity of the faecal discharge is known as

    (1) Diarrhoea　　　　　(2) Vomiting

    (3) Constipation　　　　(4) Jaundice

176. Mast cells of areolar connective tissue secrete all of the following, **except**

    (1) Melatonin　　　　　(2) Serotonin

    (3) Histamine　　　　　(4) Heparin

177. Dense irregular connective tissue has fibroblasts and many fibres that are oriented differently and is present in/beneath

    (1) Ligament　　　　　(2) Tendon

    (3) Dentine　　　　　　(4) Dermis of skin

178. Desert mammals have adapted to water shortage by having nephrons with longer

    (1) Loop of Henle　　　(2) DCT

    (3) PCT　　　　　　　(4) Collecting duct

179. Reabsorption of sodium ions in DCT is controlled by the hormone ___(i)___ produced by ___(ii)___.

    Choose the option that fills the blanks **correctly**.

	(i)	(ii)
(1)	Aldosterone	Adrenal medulla
(2)	ADH	Adrenal cortex
(3)	Vasopressin	Adrenal medulla
(4)	Aldosterone	Adrenal cortex

180. Component of blood that does **not** normally enter the nephron during ultrafiltration is

    (1) Urea　　　　　　　(2) Albumin

    (3) Calcium ions　　　　(4) Glucose

181. Co-enzymes are co-factors and refer to a part of holoenzyme that is

    (1) Loosely attached organic part

    (2) Transiently attached inorganic part

    (3) Firmly attached non-protein part

    (4) Protein part of enzyme

182. Uracil occurs in

    (1) RNA　　　　　　　(2) DNA

    (3) Deoxyadenosine　　(4) Guanosine

183. The bond between adenine and ribose is

    (1) Ester bond　　　　(2) Glycosidic bond

    (3) Peptide bond　　　(4) Disulphide bond

184. All of the following are specialised connective tissues, **except**

    (1) Bone　　　　　　　(2) Blood

    (3) Cartilage　　　　　(4) Areolar tissue

185. The tissue which exerts the greatest control over the body's responsiveness to changing conditions includes
    (1) Muscular tissue   (2) Connective tissue
    (3) Epithelial tissue   (4) Neural tissue

SECTION-B

186. In human respiratory system, the trachea divides at the level of which vertebra?
    (1) C_7 (2) T_5
    (3) C_5 (4) T_7

187. Which of the following is the main difference between serum and blood?
    (1) Serum contains less amount of albumin
    (2) Serum does not have antibodies
    (3) Serum contains less number of RBCs and WBCs
    (4) Serum cannot clot due to absence of fibrinogen

188. The transport of CO_2 by venous blood under normal physiological conditions in the form of bicarbonate ions is
    (1) 7%   (2) 70%
    (3) 23%   (4) 3%

189. The signal for micturition reflex starts from
    (1) Hypothalamus
    (2) Kidney
    (3) Stretch receptors in the wall of urinary bladder
    (4) Medulla oblongata

190. Enzymes which catalyse joining of biomolecules by expenditure of energy currency are categorised under
    (1) Ligases   (2) Isomerases
    (3) Lyases   (4) Transferases

191. Which of the following is the most effective parameter for evaluating catalytic efficiency of enzymes?
    (1) Optimum temperature
    (2) Molecular size
    (3) K_m value
    (4) Optimum pH

192. All of the given statements about enzymes in humans are correct, **except**
    (1) All enzymes require same optimum pH for maximal activity
    (2) Enzymes are inactivated at low temperatures
    (3) Enzymes are highly specific
    (4) Generally, enzymes are proteinaceous in nature

193. Which of the following parts of the kidney are impermeable to water?
    (1) Proximal convoluted tubule
    (2) Descending limb of Loop of Henle
    (3) Ascending limb of Loop of Henle
    (4) Collecting duct

194. Glomerulus and its surrounding Bowman's capsule together form a specialised structure called
    (1) Malpighian tubule
    (2) Rete testes
    (3) Malpighian corpuscle
    (4) Green gland

195. Osmolarity of medullary interstitium in the deepest part of renal medulla is about
    (1) 300 mOsmL^{-1}
    (2) 900 mOsmL^{-1}
    (3) 600 mOsmL^{-1}
    (4) 1200 mOsmL^{-1}

196. Select the **correct** statement about juxta-medullary nephrons.
    (1) They lack vasa recta
    (2) They are about 85% of the nephrons
    (3) Their glomeruli lie in the outer cortex
    (4) They have long loop of Henle and are placed deep into the medulla

197. The structural and functional unit of liver, containing hepatic cells arranged in the form of cords is called
    (1) Hepatocyte
    (2) Glisson's capsule
    (3) Hepatic lobule
    (4) Hepatic portal system

198. Gastric juice of an infant contains enzymes like

    (1) Pepsin, Trypsin, Lipase

    (2) Pepsin, Enterokinase, Rennin

    (3) Pepsinogen, Lipase, Rennin

    (4) Pepsin, Trypsin, Rennin

199. Select the parameter that does **not** undergo change upon strenuous exercise in a person.

    (1) Duration of cardiac cycle

    (2) Stroke volume

    (3) Cardiac output

    (4) Site where cardiac impulse originates

200. Read the following statements.

    Statement-A: Our lungs remove CO_2 (200 mL/min).

    Statement-B: Sebaceous glands eliminate certain substances like sterols, hydrocarbons and waxes as sebum.

    Choose the **correct** option.

    (1) Both the statements are correct

    (2) Both the statements are incorrect

    (3) Only statement A is correct

    (4) Only statement B is correct

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