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Name.: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Date : 11/10/2015

Test No.: 0 9

Subject Code.: 2 2 2

Time : 3 Hrs. **M.M. : 720**

HORIZON TEST SERIES

for

Medical Entrance Exam. 2016

[Test No. 9 Batch 2]

INSTRUCTIONS FOR STUDENTS

1. Read each question carefully.
2. It is mandatory to use Blue/Black Ball Point Pen to darken the appropriate circle in the answer sheet.
3. Mark should be dark and should complete fill the circle.
4. Rough work must be done on the Question Paper, no additional sheet will be provided for this purpose.
5. Do not use white-fluid or any other rubbing material on answer sheet. No change in the answer once marked.
6. Student cannot use log tables and calculators or any other material in the examination hall.
7. Before attempting the question paper, student should ensure that the test paper contains all pages and no page is missing.
8. Each correct answer carries four marks. One mark will be deducted for each incorrect answer from the total score.
9. Before handing over the answer sheet to the invigilator, candidate should check the particulars have been filled and marked correctly.
10. Immediately after the prescribed examination time is over, the answer sheet to be returned to the invigilator.
11. Use of Calculator and other Electronic device is not permitted.

Test No. 9

Topics of The Test

Physics	Laws of Motion, Friction and Circular Motion.
Chemistry	Thermodynamics.
Biology	Zoology : Respiration system in humans + Circulation. Botany : Transportation + Plant Respiration + Photosynthesis.

Test No. 9

[PHYSICS]

1. If the length of second's hand of a clock is 10 cm, the speed of its dip (in cm s^{-1}) is nearly
   (A) 2 (B) 0.5
   (C) 1.5 (D) 1
2. A rotating wheel changes angular speed from 1800 rpm to 3000 rpm in 20 s. What is the angular acceleration assuming to be uniform ?
   (A) 60π rad s^{-2} (B) 90π rad s^{-2}
   (C) 2π rad s^{-2} (D) 40π rad s^{-2}
3. A car of mass 1000 kg moves on a circular track of radius 20 m. If the coefficient of friction is 0.64, then the maximum velocity with which the car can move is
   (A) 22.4 m/s (B) 5.6 m/s
   (C) 11.2 m/s (D) None of these
4. A car is moving in a circular horizontal track of radius 10.0 m with a constant speed of 10.0 ms^{-1}. A plumb bob is suspended from the roof of the car by a light rigid rod of length 10.0m. The angle made by the rod with the track is (take, g = 10 ms^{-2})
   (A) zero (B) 30°
   (C) 45° (D) 60°
5. The acceleration of an object moving with speed v in a circle of radius r is
   (A) $\frac{v^2}{r}$, towards the centre
   (B) $\frac{v}{r}$, away from the centre
   (C) $\frac{v}{r^2}$, away from the centre
   (D) $\frac{v}{r}$, towards the centre
6. A roller coaster is designed such that riders experience 'weightlessness' as they go round the top of a hill whose radius of curvature is 20 m. The speed of the car at the top of the hill is between
   (A) 14 ms^{-1} and 15 ms^{-1}
   (B) 15 ms^{-1} and 16 ms^{-1}
   (C) 16 ms^{-1} and 17 ms^{-1}
   (D) 13 ms^{-1} and 14 ms^{-1}
7. A particle is moving along a circular path of radius 5 m with a uniform speed 5 ms^{-1}. What will be the average acceleration when the particle completes half revolution?
   (A) Zero (B) 10 ms^{-2}
   (C) 10π ms^{-2} (D) $\frac{10}{\pi}$ ms^{-2}
8. A body moving along a circular path of radius R with velocity v, has centripetal acceleration a. If its velocity is made equal to $2v$, then its centripetal acceleration is
   (A) $4a$ (B) $2a$
   (C) $\frac{a}{4}$ (D) $\frac{a}{2}$
9. A ball of mass 0.6 kg attached to a light inextensible string rotates in a vertical circle of radius 0.75 m such that it has speed of 5 ms^{-1} when the string is horizontal. Tension in string when it is horizontal on other side is (take, g = 10 ms^{-2})
   (A) 30 N (B) 26 N
   (C) 20 N (D) 6 N

Space for Rough Work

10. A car runs at a constant speed on a circular track of radius 100 m, taking 62.8 s for every circular lap. The average velocity and average speed for each circular lap respectively are
(A) 0, 0 (B) 0, 10 ms^{-1}
(C) 10 ms^{-1}, 10 ms^{-1} (D) 10 ms^{-1}, 0

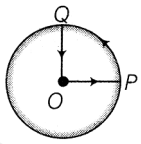
11. One end of a string of length l is connected to a particle of mass m and the other to a small peg on a smooth horizontal table. If the particle moves in a circle with speed v, the net force on the particle (directed towards the centre) is
(A) T (B) $T-\frac{mv^2}{l}$
(C) $T+\frac{mv^2}{l}$ (D) zero

12. A spaceman in training is rotated in a seat at the end of a horizontal arm of length 5 m. If he can withstand accelerations upto 9 g, then what is the maximum number of revolutions per second permissible ?
(take, g = 10 ms^{-2})
(A) 13.5 rps (B) 1.35 rps
(C) 0.675 rps (D) 6.75 rps

13. If a_r and a_t represent radial and tangential accelerations respectively, the motion of a particle will be uniformly circular if
(A) $a_r = 0$ and $a_t = 0$
(B) $a_r = 0$ but $a_t \neq 0$
(C) $a_r \neq 0$ but $a_t = 0$
(D) $a_r \neq 0$ and $a_t \neq 0$

14. A body is just being revolved in a vertical circle of radius R with a uniform speed. The string breaks when the body is at the highest point. The horizontal distance covered by the body after the string breaks is
(A) $2R$ (B) R
(C) $R\sqrt{2}$ (D) $4R$

15. A cyclist starts from the centre O of a circular park of radius 1 km, reaches the edge P of the park, then cycles along the circumference and returns to the centre along QO as shown in the figure. If the round trip takes 10 min, the net displacement (in metre) and average speed of the cyclist (in km/h) are



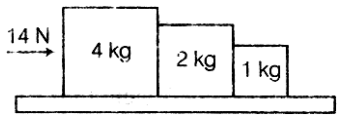
(A) 0,1 (B) $\frac{\pi+4}{2}$,0
(C) 21.4,$\frac{\pi+4}{2}$ (D) 0,21.4

16. The linear momentum of a particle varies with time t as $p = a + bt + ct^2$. Then, which of the following is correct ?
(A) Velocity of particle is inversely proportional to time
(B) Displacement of the particle is independent of time
(C) Force varies with time in a quadratic manner
(D) Force is dependent linearly on time

17. **Assertion** (A) The driver in a vehicle moving with a constant speed on a straight road is in a non-inertial frame of reference.
Reason (R) A reference frame in which Newton's laws of motion are applicable is non-inertial.
(A) Both A and R are correct and R is the correct explanation of A
(B) Both A and R are correct but R is not the correct explanation of A
(C) A is correct but R is incorrect
(D) Both A and R are incorrect

Space for Rough Work

18. Three blocks of masses 4 kg, 2 kg, 1 kg respectively are in contact on a frictionless table as shown in the figure. If a force of 14 N is applied on the 4 kg block, the contact force between the 4 kg and the 2 kg block will be



(A) 2 N (B) 6 N
(C) 8 N (D) 14 N

19. A car moving with a speed of 50 km/h can be stopped by brakes over a distance of 6 m. If the same car is moving at a speed of 100 km/h, then the stopping distance is
(A) 12 m (B) 18 m
(C) 6 m (D) 24 m

20. In non-inertial frame, the second law of motion is written as
(A) $\mathbf{F} = m\mathbf{a}$ (B) $\mathbf{F} = m\mathbf{a} + \mathbf{F}_p$
(C) $\mathbf{F} = m\mathbf{a} - \mathbf{F}_p$ (D) $\mathbf{F} = 2m\mathbf{a}$
where, $\mathbf{F}_p$ is pseudo-force while $\vec{a}$ is the acceleration of the body relative to non-inertial frame.

21. A man of mass 60 kg is riding in a lift. The weight of the man, when the lift is accelerating upwards and downwards at 2 ms^{-2}, are respectively (take, g = 10 ms^{-2})
(A) 720 N and 480 N (B) 480 N and 720 N
(C) 600 N and 600 N (D) None of these

22. A monkey of mass *m* kg slides down a light rope attached to a fixed spring balance, with an acceleration *a*. The reading of this balance is *w* kg, then (g = acceleration due to gravity)
(A) $m = \frac{wg}{g-a}$
(B) $m = w\left(1+\frac{a}{g}\right)$
(C) the force of friction exerted by the rope on the monkey is $m(g-a)$ newton
(D) the tension in the rope is *wg* newton

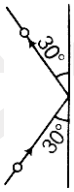
23. The minimum force required to move a body of mass *m* vertically upward is
(A) *mg* (B) *mg*/2
(C) more than 2*mg* (D) more than *mg*

24. A coin is dropped in a lift. It takes time t_1 to reach the floor when lift is stationary. It takes time t_2 when lift is moving up with constant acceleration. Then,
(A) $t_1 > t_2$ (B) $t_2 > t_1$
(C) $t_1 = t_2$ (D) $t_1 >> t_2$

25. The mass of a lift is 500 kg. When it ascends with an acceleration of 2 ms^{-2}, the tension in the cable will be (g = 10 ms^{-2})
(A) 6000 N (B) 5000 N
(C) 400 N (D) 1000 N

26. Sand is being dropped on a conveyor belt at the rate of *M* kgs^{-1}. The force necessary to keep the belt moving with a constant velocity is v ms^{-1} will be
(A) Mv newton (B) $2Mv$ newton
(C) $\frac{Mv}{2}$ newton (D) zero

27. A 0.5 kg ball moving with a speed of 12 ms^{-1} strikes a hard wall at an angle of 30° with the wall. It is reflected with the same speed and at the same angle. If the ball is in contact with the wall for 0.25 s, the average force acting on the wall is

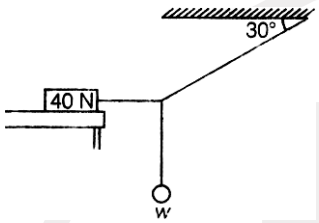


(A) 48 N (B) 24 N
(C) 12 N (D) 96 N

Space for Rough Work

28. A disc of mass 100 g is kept floating horizontally in air by firing bullets, each of mass 5 g with the same velocity at the same rate of 10 bullets per second. The bullets rebound with the same speed in opposite direction. The velocity of each bullet at the time of impact is
(A) 196 cm s^{-1} (B) 9.8 cm s^{-1}
(C) 98 cm s^{-1} (D) 980 cm s^{-1}

29. In the figure given, the system is in equilibrium. What is the maximum value that *w* can have if the friction force on the 40 N block cannot exceed 12.0 N ?



(A) 3.45 N (B) 6.92 N
(C) 10.35 N (D) 12.32 N

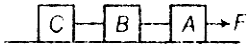
30. A weight *w* is suspended from the mid-point of a rope, whose ends are at the same level. In order to make the rope perfectly horizontal, the force applied to each of its ends must be
(A) less than *w* (B) equal to *w*
(C) equal to 2*w* (D) infinitely large

31. A block is pushed momentarily on a horizontal surface with initial velocity v. If μ is the coefficient of sliding friction between the block and surface, the block will come to rest after time (g = acceleration due to gravity)

(A) $\frac{v}{\mu g}$ (B) $\frac{vg}{g}$

(C) $\frac{v\mu}{g}$ (D) $\frac{\mu g}{v}$

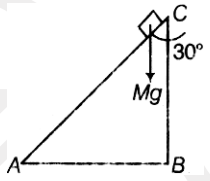
32. Three identical blocks of masses *m* = 2kg are drawn by a force 10.2 N on a frictionless surface. What is the tension (in N) in the string between the blocks B and C ?



(A) 9.2 (B) 8
(C) 3.4 (D) 9.8

33. A car of mass 1000 kg negotiates a banked curve of radius 90 m on a frictionless road. If the banking angle is 45°, the speed of the car is
(A) 20 ms^{-1} (B) 30 ms^{-1}
(C) 5 ms^{-1} (D) 10 ms^{-1}

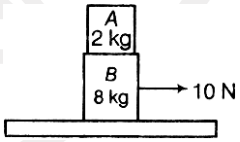
34. A body of mass *M* starts sliding down on the inclined plane, where the critical angle is $\angle ACB = 30°$ as shown in figure. The coefficient of kinetic friction will be



(A) $Mg/\sqrt{3}$ (B) $\sqrt{3}Mg$
(C) $\sqrt{3}$ (D) None of these

35. An object is moving on a plane surface with uniform velocity 10 ms^{-1} in presence of a force 10 N. The frictional force between the object and the surface is
(A) 1 N (B) –10 N
(C) 10 N (D) 100 N

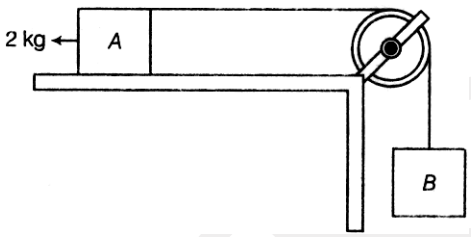
36. Block A of mass of 2 kg is placed over block B of mass 8 kg. The combination is placed over a rough horizontal surface. Coefficient of friction between B and the floor is 0.5. Coefficient of friction between blocks A and B is 0.4. A horizontal force of 10 N is applied on block B. The force of friction between blocks A and B is
(g = 10 ms^{-2})



(A) 100 N (B) 40 N
(C) 50 N (D) zero

Space for Rough Work

37. The coefficient of static friction, μ_s between block A of mass 2 kg and the table as shown in the figure is 0.2. What would be the maximum mass value of block B so that, the two blocks do not move ? The string and the pulley are assumed to be smooth and massless (take, g = 10 ms^{-2})

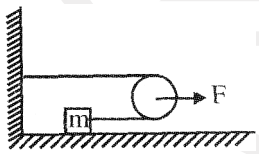


(A) 2.0 kg (B) 4.0 kg
(C) 0.2 kg (D) 0.4 kg

38. Which of the following statements is not ture ?
(A) The coefficient of friction between two surfaces increases as the surface in contact are made rough
(B) The force of friction acts in the direction opposite to the applied force
(C) Rolling friction is greater than sliding friction
(D) The coefficient of friction between wood and wood is less than 1

39. A block of mass 2 kg rests on a horizontal surface. If a horizontal force of 5 N is applied on the block the frictional force on it, is ($\mu_k = 0.4, \mu_s = 0.5$)
(A) 5 N (B) 10 N
(C) 8 N (D) zero

40. In the given figure the pulley is assumed massless and frictionless. If the friction force on the object of mass *m* is *f*, then its acceleration in terms of the force *F* will be equal to



(A) $(F-f)/m$ (B) $\left(\frac{F}{2}-f\right)/m$
(C) F/m (D) None of these

41. To determine the coefficient of friction between a rough surface and a block, the surface is kept inclined at 45° and the block is released from rest. The block takes a time *t* in moving a distance *d*. The rough surface is then replaced by a smooth surface and the same experiment is repeated. The block now takes a time *t*/2 in moving down the same distance *d*. The coefficient of friction is
(A) 3/4 (B) 5/4
(C) 1/2 (D) $1/\sqrt{2}$

42. The upper half of an inclined plane of inclination θ is perfectly smooth while lower half is rough. A block starting from rest at the top of the plane will again come to rest at the bottom, if the coefficient of friction between the block and lower half of the plane is given by
(A) $\mu = \frac{1}{\tan\theta}$ (B) $\mu = \frac{2}{\tan\theta}$
(C) $\mu = 2\tan\theta$ (D) $\mu = \tan\theta$

43. A cubical block rests on an inclined plane of coefficient of friction $\mu = 1/\sqrt{3}$. What should be the angle of inclination so that the block just slides down the inclined plane ?
(A) 30° (B) 60°
(C) 45° (D) 90°

44. A body of mass 10 kg is lying on a rough plane inclined at an angle of 30° to the horizontal and the coefficient of friction is 0.5. The minimum force required to pull the body up the plane is
(A) 914 N (B) 91.4 N
(C) 9.14 N (D) 0.914 N

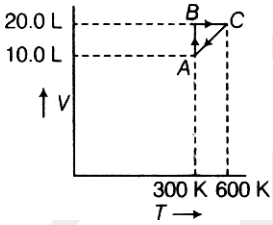
45. A body takes time *t* to reach the bottom of an inclined plane of angle θ with the horizontal. If the plane is made rough, time taken now is $2t$. The coefficient of friction of the rough surface is
(A) $\frac{3}{4}\tan\theta$ (B) $\frac{2}{3}\tan\theta$
(C) $\frac{1}{4}\tan\theta$ (D) $\frac{1}{2}\tan\theta$

Space for Rough Work

[CHEMISTRY]

46. A chemical process is carried out in a thermostat maintained at 25°C, it is known as
(A) isothermal (B) isobaric
(C) adiabatic (D) isotropic

47. This graph expresses the various steps of the system containing 1 mole of gas. Which type of process system has when it moves from *C* to *A* ?

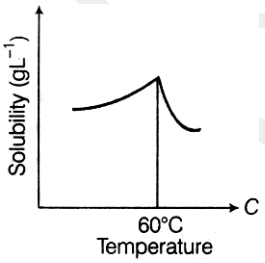


(A) Isochoric (B) Isobaric
(C) Isothermal (D) Cyclic

48. If *W* is the amount of work done by the system and *q* is the amount of heat supplied to the system, identify the type of the system.
(A) Isolated system
(B) Closed system
(C) Open system
(D) System with thermally conducting walls

49. We believe in the laws of thermodynamics because they are
(A) theoretical
(B) derived based on mathematical analysis
(C) empirical and nobody disproved
(D) mere statements

50. Solubility curve of a hydrated salt in water with temperature is given. The curve indicates that the solution process is



(A) exothermic
(B) exothermic till 60°C and endothermic after 60°C
(C) endothermic till 60°C and exothermic thereafter
(D) endothermic

51. The work done when two moles of an ideal gas is compressed from a volume of 5m^3 to 1 dm^3 at 300 K, under a pressure of 100 kPa is
(A) 499.9 kJ (B) –499.9 kJ
(C) –99.5 kJ (D) 42495 kJ

52. Based on the first law of thermodynamics, which one of the following is correct ?
(A) For an isothermal process, $q = +W$
(B) For an isochoric process, $\Delta U = -q$
(C) For an adiabatic process, $\Delta U = -W$
(D) For a cyclic process, $q = -W$

53. If 1 mole of an ideal gas expands isothermally at 37°C from 15 L to 25 L, the maximum work obtained is
(A) 12.87 J (B) 6.43 J
(C) 8.57 J (D) 2.92 J

54. An ideal gas expands in volume from 1×10^{-3} to 1×10^{-2} at 300 K against a constant pressure 1×10^5 Nm^{-2}. The work done is
(A) –900 J (B) –900 kJ
(C) 270 kJ (D) 900 kJ

55. At the same conditions of pressure, volume and temperature, work done is maximum for which gas if all gases have equal masses ?
(A) NH_3 (B) N_2
(C) Cl_2 (D) H_2S

56. ΔE is always positive when
(A) system absorbs heat and work is done on it
(B) system emits heat and work is done by it
(C) system emits heat and no work is done on it
(D) system absorbs heat and work is done by it

Space for Rough Work

57. Calculate the work done when 1 mole of an ideal gas is compressed reversibly from 1 bar to 4 bar at a constant temperature of 300 K.

(A) 4.01 kJ (B) –8.02 kJ

(C) 18.02 kJ (D) None of these

58. Internal energy is the sum of

(A) kinetic energy and potential energy

(B) all types of energy of the system

(C) energy of internal system

(D) None of the above

59. A gas expands isothermally against a constant external pressure of 1 atm from a volume of 10 dm^3 to a volume of 20 dm^3. It absorbs 800 J of thermal energy from its surroundings. The ΔU is

(A) –312 J (B) +123 J

(C) –213 J (D) +231 J

60. To calculate the amount of work done in joules during reversible expansion of an ideal gas, the volume must be expressed in

(A) Only m^3 (B) Only dm^3

(C) Only cm^3 (D) All of these

61. Assuming enthalpy of combustion of hydrogen at 273 K is –286 kJ and enthalpy of fusion of ice at the same temperature to be 6.0 kJ. Calculate enthalpy change during formation of 100 g of ice.

(A) +1622 kJ (B) –1622 kJ

(C) +292 kJ (D) –292 kJ

62. A person inhales 640 g of O_2 per day. If all O_2 is used for converting sugar into CO_2 and H_2O, how much sucrose ($C_{12}H_{22}O_{11}$) is consumed in the body in one day and what is the heat evolved ?

[ΔH for combustion of sucrose = –5645 kJ mol^{-1}]

(A) 530 g, 9403.34 kJ

(B) 570 g, 9408.34 kJ

(C) 500 g, 9402.27 kJ

(D) 1140 g, –18816 kJ

63. The value of ΔH for cooling 2 moles of an ideal monoatomic gas from 225°C to 125°C at constant pressure will be [given, $C_p = \frac{5}{2}R$]

(A) 250 R (B) –500 R

(C) 500 R (D) –250 R

64. Given that,

$$C + O_2 \longrightarrow CO_2; \Delta H^\circ = -x\text{kJ}$$

$$2CO + O_2 \longrightarrow 2CO_2; \Delta H^\circ = -y\text{kJ}$$

The heat of formation of carbon monoxide will be

(A) $\frac{y-2x}{2}$ (B) $y+2x$

(C) $2x-y$ (D) $\frac{2x-y}{2}$

65. The enthalpies of formation of $C_2H_2(g)$ and $C_6H_6(g)$ at 298 K are 230 and 85 kJ/mol respectively. The enthalpy change for the reaction is

(A) 605 kJ/mol (B) 865 kJ/mol

(C) –605 kJ/mol (D) –865 kJ/mol

66. Standard enthalpy of vaporisation $\Delta_{vap}H^\circ$ for water at 100°C is 40.66 kJ/mol. The internal energy of vaporisation of water at 100°C (in kJ/mol) is

(Assume water vapour behave like an ideal gas)

(A) +37.56 (B) –43.76

(C) +43.76 (D) +40.66

67. The enthalpy of dissolution of $BaCl_2(s)$ and $BaCl_2 \cdot 2H_2O(s)$ are 20.6 and 8.8 kJ/mol respectively. The enthalpy of hydration for

$BaCl_2(s) + 2H_2O \longrightarrow BaCl_2 \cdot 2H_2O(s)$ is

(A) 29.4 kJ (B) –29.4 kJ

(C) –11.8 kJ (D) 38.2 kJ

Space for Rough Work

68. Given,

$$NH_3(g) + 3Cl_2(g) \rightleftharpoons NCl_3(g) + 3HCl(g); -\Delta H_1$$
$$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g); -\Delta H_2$$
$$H_2(g) + Cl_2(g) \rightleftharpoons 2HCl(g); \Delta H_3$$

The heat of formation of $NCl_3(g)$ in terms of $\Delta H_1, \Delta H_2$ and ΔH_3 is

(A) $\Delta H_f = -\Delta H_1 + \frac{\Delta H_2}{2} - \frac{3}{2}\Delta H_3$

(B) $\Delta H_f = \Delta H_1 + \frac{\Delta H_2}{2} - \frac{3}{2}\Delta H_3$

(C) $\Delta H_f = \Delta H_1 + \frac{\Delta H_2}{2} - \frac{3}{2}\Delta H_3$

(D) None of the above

69. The bond energies of C — C, C ═ C, H— H and C — H linkages are 350, 600, 400 and 410 kJ/mol respectively. The heat of hydrogenation of ethylene is

(A) –170 kJ mol^{-1} (B) –260 kJ mol^{-1}

(C) –400 kJ mol^{-1} (D) –450 kJ mol^{-1}

70. Kirchhoff's equation is

(A) $\log\frac{k_2}{k_1} = \frac{E_a}{2.303R}\left[\frac{1}{T_1} - \frac{1}{T_2}\right]$

(B) $\log\frac{p_2}{p_1} = \frac{\Delta H_V}{2.303R}\left[\frac{T_2 - T_1}{T_1 \times T_2}\right]$

(C) $\Delta C_p = \frac{\Delta H_2 - \Delta H_1}{T_2 - T_1}$

(D) $\log\frac{k_2}{k_1} = \frac{\Delta H}{2.303R}\left[\frac{1}{T_1} - \frac{1}{T_2}\right]$

71. The enthalpy of neutralisation of oxalic acid by a strong base is –25 kcal mol^{-1}. The enthalpy of neutralisation of strong acid and strong base is –13.7 kcal $equiv^{-1}$. The enthalpy of dissociation of

$H_2C_2O_4 \rightleftharpoons 2H^+ + C_2O_4^{2-}$ is

(A) 1.0 kcal mol^{-1} (B) 2.0 kcal mol^{-1}

(C) 18.55 kcal mol^{-1} (D) 11.7 kcal mol^{-1}

72. **Assertion** (A) For the combustion of methane, $\Delta E > \Delta H$.

Reason (R) ΔH is related to ΔE by the expression, $\Delta H = \Delta E + \Delta nRT$.

(A) Both A and R are correct and R is the correct explanation of A

(B) Both A and R are correct but R is not the correct explanation of A

(C) A is correct but R is incorrect

(D) Both A and R are incorrect

73. Assume each reaction is carried out in an open container. For which reaction will $\Delta H = \Delta E$?

(A) $H_2(g) + Br_2(g) \rightarrow 2HBr(g)$

(B) $C(s) + 2H_2O(g) \rightarrow 2H_2(g) + CO_2(g)$

(C) $PCl_5(g) \rightarrow PCl_3(g) + Cl_2(g)$

(D) $2CO(g) + O_2(g) \rightarrow 2CO_2(g)$

74. In which of the following reactions, the heat liberated is known as 'heat of combustion' ?

(A) $H^+(aq) + OH^-(aq) \rightarrow H_2O(l) + Heat$

(B) $C_{(graphite)} + \frac{1}{2}O_2(g) \rightarrow CO(g) + Heat$

(C) $CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(l) + Heat$

(D) $H_2SO_4(aq) + H_2O(l) \rightarrow H_2SO_4(aq) + Heat$

75. The absolute enthalpy of neutralisation of the reaction,

$MgO(s) + 2HCl(aq) \rightarrow MgCl_2(aq) + H_2O(l)$ will be

(A) less than –57.33 kJ mol^{-1}

(B) –57.33 kJ mol^{-1}

(C) greater than –57.33 kJ mol^{-1}

(D) 57.33 kJ mol^{-1}

Space for Rough Work

76. For the reaction, $X_2O_4(l) \rightarrow 2XO_2(g)$

ΔU = 2.1 kcal, ΔS = 20 cal K^{-1} at 300 K.

Hence, ΔG is

(A) 2.7 kcal (B) –2.7 kcal
(C) 9.3 kcal (D) –9.3 kcal

77. For a certain process, ΔH = 178 kJ and ΔS = 160 J/K. What is the minimum temperature at which the process is spontaneous (assuming that ΔH and ΔS do not vary with temperature) ?

(A) 2112.3 K (B) 136.7 K
(C) 275.8 K (D) 1112.5 K

78. For a spontaneous process, the correct statement (s) is (are)

(A) $(\Delta G_{system})_{T,p} > 0$

(B) $(\Delta S_{system}) + (\Delta S_{surroundings}) > 0$

(C) $(\Delta G_{system})_{T,p} < 0$

(D) $(\Delta U_{system})_{T,p} > 0$

79. The enthalpy of fusion of water is 1.435 kcal/mol. The molar entropy change for the melting of ice at 0°C is

(A) 10.52 cal/mol K
(B) 21.04 cal/mol K
(C) 5.260 cal/mol K
(D) 0.526 cal/mol K

80. Which of the following is correct ?

(A) Evaporation of water causes an increase in disorder of the system
(B) Melting of ice causes a decrease in randomness of the system
(C) Condensation of steam causes an increase in disorder to the system
(D) There is practically no change in the randomness of the system when water is evaporated

81. Standard entropies of X_2, Y_2 and XY_3 are 60, 40 and 50 JK^{-1} mol^{-1} respectively. For the reaction,

$$\frac{1}{2}X_2 + \frac{3}{2}Y_2 \rightleftharpoons XY_3; \Delta H = -30\text{kJ}$$

to be at equilibrium, the temperature should be

(A) 500 K (B) 750 K
(C) 1000 K (D) 1250 K

82. **Assertion** (A) The enthalpy of formation of gaseous oxygen molecules at 298 K and under a pressure of one atmosphere is zero.

Reason (R) The entropy of formation of gaseous oxygen molecule under the same conditions is zero.

(A) Both A and R are correct and R is the correct explanation of A
(B) Both A and R are correct but R is not the correct explanation of A
(C) A is correct but R is incorrect
(D) Both A and R are incorrect

83. Entropy changes for the process,

$$H_2O(l) \rightarrow H_2O(s)$$

at normal pressure and 274 K are given below $\Delta S_{system} = -22.13, \Delta S_{surr} = +22.05$, the process is non-spontaneous because

(A) ΔS_{system} is – ve (B) ΔS_{surr} is + ve
(C) ΔS_u is – ve (D) $\Delta S_{system} \neq \Delta S_{surr}$

84. One mole of which of the following has the highest entropy ?

(A) Liquid nitrogen (B) Hydrogen gas
(C) Mercury (D) Diamond

85. Standard enthalpy and standard entropy changes for the oxidation of ammonia at 298 K are –382.64 kJ mol^{-1} and –145.6 $JK^{-1}mol^{-1}$, respectively. Standard Gibbs energy change for the same reaction at 298 K is

(A) –2221.1 kJ mol^{-1} (B) –339.3 kJ mol^{-1}
(C) –439.3 kJ mol^{-1} (D) –523.2 kJ mol^{-1}

Space for Rough Work

86. In which of the following process, maximum increase in entropy is observed ?
(A) Melting of ice
(B) Sublimation of naphthalene
(C) Condensation of water
(D) Dissolution of salt in water

87. Identify the correct statement for change of Gibbs energy for a system (ΔG_{system}) at constant temperature and pressure.
(A) If $\Delta G_{system} > 0$, the process is spontaneous
(B) If $\Delta G_{system} = 0$, the system has attained equilibrium
(C) If $\Delta G_{system} = 0$, the system is still moving in a particular direction
(D) If $\Delta G_{system} < 0$, the process is not spontaneous

88. **Assertion** (A) water in liquid form has higher entropy than ice at room temperature.
Reason (R) Water in liquid form has higher entropy than ice.
(A) Both A and R are correct and R is the correct explanation of A
(B) Both A and R are correct but R is not the correct explanation of A
(C) A is correct but R is incorrect
(D) Both A and R are incorrect

89. For spontaneous reaction or the reaction at equilibrium which of the following is wrong ?
(A) $\Delta H < T\Delta S$ reaction is exothermic and $T\Delta S$ is positive
(B) $\Delta H = -\text{ve}, T\Delta S = 0$
(C) $\Delta H = T\Delta S$
(D) $\Delta H = -\text{ve}, T\Delta S = -\text{ve}$

90. Which of the following is always negative for exothermic reaction ?
(A) ΔH (B) ΔS
(C) ΔG (D) None of the above

[ZOOLOGY]

91. Choose the wrong statement.
(A) Solubility of CO_2 in blood is 20-25 times higher than that of O_2
(B) The total volume of air accommodated in the lungs at the end of a forced inspiration is called the 'vital capacity'
(C) O_2 can bind with haemoglobin in a reversible manner to form oxyhaemoglobin
(D) Every 100 mL of deoxygenated blood delivers approximately 4 mL of CO_2 to the alveoli

92. What is the p_{O_2} and p_{CO_2} in the systemic arteries ?
(A) p_{O_2} 40 mm Hg; p_{CO_2} 45 mm Hg
(B) p_{O_2} 95 mm Hg; p_{CO_2} 40 mm Hg
(C) p_{O_2} 40 mm Hg; p_{CO_2} 40 mm Hg
(D) p_{O_2} 45 mm Hg; p_{CO_2} 40 mm Hg

93. The volume of air that can be breathed in by maximum forced inspiration over and above the normal inspiration is called
(A) expiratory reserve volume
(B) inspiratory reserve volume
(C) vital capacity
(D) inspiratory capacity

94. Amount of oxygen supplied by 100 mL arterial blood while passing through the tissues is
(A) 0.4 – 0.6 mL (B) 4 – 6 mL
(C) 14 – 15 mL (D) 19 – 20 mL

95. Hiccups can be best described as
(A) forceful sudden expiration
(B) jerky incomplete inspiration
(C) vibration of the soft palate during breathing
(D) sign of indigestion

Space for Rough Work

96. **Assertion** (A) CO_2 transport occurs very fast through RBCs.
Reason (R) Enzyme carbonic anhydrase is absent in blood plasma.
(A) Both A and R are correct and R is the correct explanation of A
(B) Both A and R are correct, but R is not correct explanation of A
(C) A is correct, but R is incorrect
(D) A is incorrect, but R is correct

97. What is true about RBCs in humans ?
(A) They carry about 20-25% of carbon dioxide
(B) They transport 99.5% of oxygen
(C) They transport about 80% oxygen only and the rest 20% of it is transported in dissolved state in blood plasma
(D) They do not carry carbon dioxide at all

98. Pick the correct statement.
(A) The contraction of internal intercostal muscles lifts up the ribs
(B) The RBCs transport oxygen only
(C) The thoracic cavity is anatomically an air tight chamber
(D) Healthy man can inspire approximately 500 mL of air per minute

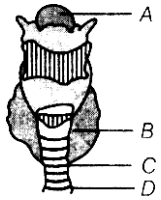
99. Which one is the cofactor of carbonic anhydrase ?
(A) Iron (B) Zinc
(C) Copper (D) Magnesium

100. Which is called Hamburger shift ?
(A) Hydrogen shift (B) Bicarbonate shift
(C) Chloride shift (D) Sodium shift

101. Left shift of oxyhaemoglobin curve is noticed under
(A) normal temperature and pH
(B) low temperature and high pH
(C) low pH and high temperature
(D) low pH and low temperature

102. Severe Acute Respiratory Syndrome (SARS)
(A) is caused by a variant of Pneumococcus pneumoniae
(B) is caused by a variant of the common cold virus (corona virus)
(C) is an acute form of asthma
(D) affects non-vegetarians much faster than vegetarians

103. The alongside diagram represents the human larynx along side. Choose the correct combination of labelling from the options given.



(A) A–Larynx
B–Parathyroid
C–Tracheal cartilage
D–Trachea
(B) A–Nasopharynx
B–Thyroid gland
C–Cartilage
D–Trachea
(C) A–Trachea
B–Thyroid gland
C–Bronchiole
D–Tracheal cartilage
(D) A–Epiglottis
B–Thyroid gland
C–Tracheal cartilage
D–Trachea

104. After a deep inspiration and maximum expiration, the capacity of lungs is known as
(A) Vital capacity (B) tidal volume
(C) IRV (D) ERV

105. Arrange the following in the order of increasing volume
I. Tidal volume
II. Residual volume
III. Expiratory reserve volume
IV. Vital capacity
(A) I<II<III<IV (B) I<III<II<IV
(C) I<IV<III<II (D) I<IV<II<III

106. The percentage of oxygen in inhaled air is about
(A) 21% (B) 16%
(C) 79% (D) 4%

Space for Rough Work

107. Respiratory centre is present in
(A) cerebellum
(B) cerebrum
(C) medulla oblongata
(D) hypothalamus

108. Blood analysis of a patient reveals an unusually high quantity of carboxyhaemoglobin content. Which of the following conclusions is most likely to be correct ?
(A) The patient has been inhaling polluted air containing usually high content of carbon disulphide
(B) The patient has been inhaling polluted air containing usually high content of chloroform
(C) The patient has been inhaling polluted air containing usually high content of carbon dioxide
(D) The patient has been inhaling polluted air containing usually high content of carbon monoxide

109. Which of the following statements is not true ?
(A) The partial pressure of oxygen in deoxygenated blood is 40 mm Hg
(B) The partial pressure of oxygen in oxygenated blood is 95 mm Hg
(C) The partial pressure of oxygen in the alveolar air is 104 mm Hg
(D) The partial pressure of carbon dioxide in deoxygenated blood is 95 mm Hg

110. Which of the following statements are correct/ incorrect?
I. The blood transports carbon dioxide comparatively easily because of its highest solubility.
II. Approximately 89% of carbon dioxide is transported being dissolved in the plasma of blood.
III. The carbon dioxide produced by the tissues, diffuses passively into the blood stream and passes into red blood corpuscles and react with water to form H_2CO_3.
IV. The oxyhaemoglobin (HbO_2) of the erythrocytes is basic.
V. The chloride ions diffuse from plasma into the erythrocytes to maintain ionic balance.
(A) I, III and V are correct, II and IV are incorrect
(B) I, III and V are incorrect, II and IV are correct
(C) I, II and IV are correct, III and V are incorrect
(D) I, II and IV are incorrect, III and V are correct

111. About 1000 mL of air is always known to remain inside the human lungs. It is described as
(A) inspiratory reserve volume
(B) expiratory reserve volume
(C) residual volume
(D) tidal volume

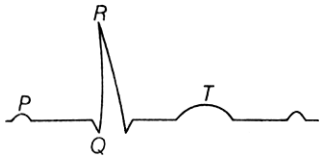
112. Although much carbon dioxide is carried in blood, yet blood does not become acidic because
(A) CO_2 is continuously diffused through the tissues and is not allowed to accumulate
(B) CO_2 combines with water to form H_2CO_3, which is neutralised by Na_2CO_3
(C) in CO_2 transport, blood buffers play an important role
(D) CO_2 is absorbed by leucocytes

113. Thrombokinase is associated with
(A) elimination of urea and other excretory products from the body
(B) production of erythrocytes from the bone marrow
(C) pulmonary and systemic circulation
(D) enzymatic reactions in coagulations of blood

114. Identify the correct statement regarding cardiac activity
(A) normal activities of the human heart is regulated intrinsically, hence it is neurogenic
(B) a special neural centre in the medulla oblongata can moderate the cardiac function through the CNS
(C) parasympathetic neural signals increase the rate of heartbeat
(D) adrenal medullarly hormones can increase cardiac output

Space for Rough Work

115. The diagram given here is the standard ECG of a normal person. The P-wave represents the



(A) contraction of both the atria
(B) initiation of the ventricular contraction
(C) beginning of the systole
(D) end of systole

116. Which of the following matches correctly ?

(A) Inferior vena cava - Receives deoxygenated blood from the head and body
(B) Superior vena cava - Receives deoxygenated blood from the lower body and organs
(C) Pulmonary artery - Carries deoxygenated blood to the lungs
(D) Hepatic artery - Carries deoxygenated blood to the gut

117. WBC is true cell due to
(A) absence of nucleus
(B) devoid of haemoglobin
(C) absence of cell wall
(D) presence of nucleus

118. Mast cells of connective tissue contain
(A) vasopressin and relaxin
(B) heparin and histamine
(C) heparin and calcitonin
(D) serotonin and melanine

119. Which of the following factors has little effect on blood flow in arteries ?
(A) Heartbeat
(B) Blood pressure
(C) Skeletal muscle contraction
(D) Total cross sectional area of vessels

120. In a normal adult human, the average stroke volume is
(A) 47 mL (B) 70 mL
(C) 5 mL (D) 3.3 mL

121. Which one of the following plasma proteins is involved in the coagulation of blood ?
(A) Serum amylase (B) A globulin
(C) Fibrinogen (D) An albumin

122. Pacemaker is
(A) instrument for measuring heartbeat
(B) instrument for measuring pulse rate
(C) AV node that provides impulse for heartbeat
(D) Sino-auricular node that provides impulse for heartbeat

123. If due to some injury the chordae tendinae of the tricuspid value of the human heart is partially non-functional, what will be the immediate effect ?
(A) The flow of blood into the aorta will be slowed down
(B) The 'pacemaker' will stop working
(C) The blood will tend to flow back into the left atrium
(D) The flow of blood into the pulmonary artery will be reduced

124. Which of the following are located in tunica media of human blood vessels ?
(A) Collagen fibres and smooth muscle
(B) Squamous epithelium and striated muscle
(C) Yellow fibres and smooth muscle
(D) Yellow fibres and striated muscle

125. The deposition of lipids on the wall lining, the lumen of large and medium-sized arteries is referred to as
(A) deep vein thrombosis
(B) Stokes-Adam's syndrome
(C) osteoporosis
(D) atherosclerosis

Space for Rough Work

126. The cardiac cycle in normal person is about
(A) 0.5 sec (B) 0.8 sec
(C) 1.0 sec (D) 1.2 sec

127. The cardiac pacemaker in a patient fails to function normally. The doctors find that an artificial pacemaker is to be grafted in him. It is likely that it will be grafted at the site of
(A) atrioventricular bundle
(B) Purkinje system
(C) sino-atrial node
(D) atrioventricular node

128. **Assertion** (A) Smaller the organism higher is the rate of metabolism per gram weight.
Reason (R) The heart rate of six months old baby is much higher than that of an old person.
(A) Both A and R are correct and R is the correct explanation of A
(B) Both A and R are correct, but R is not correct explanation of A
(C) A is correct, but R is incorrect
(D) Both A and R are incorrect

129. In diastole, heart is filled by
(A) mixed blood
(B) venous blood
(C) oxygenated blood
(D) deoxygenated blood

130. Maximum surface area of circulating system is seen in
(A) heart (B) capillaries
(C) arterioles (D) veins

131. A heart murmur indicates a defective
(A) bundle of His (B) heart valves
(C) sino-atrial node (D) atrio-ventricular node

132. The largest RBCs have been seen in
(A) elephant (B) whale
(C) amphibians (D) man

133. How many double circulations are normally completed by the human heart, in one minute ?
(A) Eight (B) Sixteen
(C) Seventy two (D) Thirty six

134. 'Heart of Heart' is
(A) SA-node (B) AV-node
(C) bundle of His (D) Purkinje fibres

135. Maximum pressure of blood experienced during when blood enters from
(A) right ventricle to aorta
(B) right auricle to aorta
(C) left ventricle to aorta
(D) left auricle to aorta

[BOTANY]

136. What is correct
(A) Chl *a* is blue green, $C_{55}H_{70}O_6N_4Mg$
(B) Xanthin is $C_{40}H_{56}$
(C) Chl *a* is blue green $C_{55}H_{72}O_5N_4Mg$
(D) Chl *b* is yellow green $C_{55}H_{70}O_5N_4Mg$

137. During photosynthesis
(A) O_2 comes from CO_2
(B) ATP is formed
(C) ATP is not formed
(D) Water is not required as reactant but only as a medium.

138. First transitory chemical formed by reaction between CO_2 and RuBP is
(A) PGAL/GAP
(B) PGA
(C) 2-carboxy 3-keto, 1,5-biphosphoribotol
(D) DiHAP

Space for Rough Work

139. Red colour of tomato is due to
(A) Lycopene
(B) Phytochrome
(C) Chromatochrome
(D) Anthocyanin

140. Electrons lost by PS II are regained from
(A) O_2 (B) CO_2
(C) H_2O (D) None of the above

141. Photoautotrophs lacking chlorophyll *a* are
(A) Cyanobacteria (B) Red alagae
(C) Brown algae (D) Bacteria

142. Chlorophyll appears green because it
(A) Reflects green light
(B) Transmits green light
(C) Absorbs green light
(D) Transforms green light

143. In photosynthesis, energy for passage of electron is the one that is absorbed by
(A) Chlorophyll (B) RuBP
(C) Water (D) ATP

144. ADP $\longrightarrow$ ATP reaction occurs when protons (H^+) are passed from
(A) Thylakoid to cytosol
(B) Thylakoid to lumen
(C) Lumen of thylakoid to stroma
(D) Stroma to thylakoid lumen

145. What is true
(A) PEP-pyruvate causes substrate phosphorylation
(B) PS II has oxygen producing complex
(C) NADPH is assimilatory power
(D) All the above

146. ETC of photosynthesis process is
(A) Bound to thylakoid membrane
(B) Present in stroma
(C) Bound to outer chloroplast membrane
(D) Dispersed in cytosol.

147. Maximum starch is manufactured by
(A) Spongy parenchyma
(B) Palisade parenchyma
(C) Guard cells
(D) Vascular tissue

148. The process by which excess energy is lost is
(A) Fluorescence
(B) Photooxidation
(C) Photolysis
(D) Photophosphorylation

149. Which one is photophosphorylation
(A) ADP + AMP $\xrightarrow{\text{Light energy}}$ ATP
(B) ADP + Inorganic phosphate $\xrightarrow{\text{Light energy}}$ ATP
(C) ADP + Inorganic PO_4 $\xrightarrow{\text{Light energy}}$ ATP
(D) AMP + Inorganic PO_4 $\xrightarrow{\text{Light energy}}$ ATP

150. Stomata of CAM plants
(A) Are always open
(B) Open during day and close a night
(C) Open during night and close during day
(D) Both A and B

151. Anaerobic respiration takes place in
(A) Ribosome (B) Nucleus
(C) Vacuole (D) Cytoplasm.

Space for Rough Work

152. What is required in both photosynthesis and respiration
(A) Chlorophyll (B) CO_2
(C) O_2 (D) Cytochromes

153. When malic acid is respiratory substrate, the amount of CO_2 released is
(A) More than O_2 consumed
(B) Less than O_2 released
(C) Equal to O_2 consumed
(D) CO_2 is not released.

154. At the end of citric acid cycle most of the energy is transferred to
(A) NADH and $FADH_2$
(B) Oxaloacetic acid
(C) Citric acid
(D) ATP

155. End product of anaerobic respiration is
(A) $C_2H_5OH + CO_2$ (B) Lactic acid + H_2O
(C) CO_2 (D) A or B

156. In aerobic respiration one glucose produces
(A) 8 NADH + 2 $FADH_2$ + 2ATP
(B) 12 NADH + 2$FADH_2$ + 38 ATP
(C) 12 NADH + 30 ATP + H_2O
(D) 10 NADH + 2 $FADH_2$ + 2ATP + 2 GTP

157. What occurs in glycolysis
(A) Fixation
(B) Reduction
(C) Dehydrogenation
(D) Oxidation

158. Match the items of column I and II and choose the correct option.

	Column I		Column II
a	Krebs cycle	*p*	Stroma
b	Glycolysis	*q*	Grana
c	Calvin cycle	*r*	Mitochondrial matrix
		s	Cytoplasm

(A) a – s, b – r, c – q
(B) a – r, b –s, c – p
(C) a – s, b – r, c – p
(D) a – r, b – s, c – q

159. RQ of sprouting potato is
(A) 1 (B) > 1
(C) < 1 (D) Zero

160. In a fully turgid cell
(A) TP = 0 (B) WP = 0
(C) DPD = 0 (D) OP = 0

161. Water in the soil available to plants is
(A) gravitational water
(B) capillary water
(C) hygroscopic water
(D) None of these

162. When a cell is plasmolysed, it becomes
(A) flaccid and its TP becomes zero
(B) turgid and its TP becomes zero
(C) turgid and TP becomes equal to OP
(D) flaccid and DPD becomes zero

163. The space between the plasma membrane and the cell wall of a plasmolyzed cell surrounded by a hypertonic solution is occupied by the
(A) hypotonic solution
(B) isotonic solution
(C) hypertonic solution
(D) water

164. RBC and a plant cell (with thick cell wall) are placed in distilled water. The solute concentration is the same in both the cells. What changes would be observed in them ?
(A) Both plant cell and RBC would not undergo any change
(B) The RBC would increase in size and burst, while the plant cell would remain about the same size.
(C) The plant cell would increase in size and burst, while the RBC would remain about the same size.
(D) Both plant cell and RBC would decrease in size and collapse.

Space for Rough Work

165. Which one is incorrect statement ?
(A) Movement of water is expressed in terms of free energy
(B) Free energy determines the direction by which physical and chemical changes should occur
(C) Water potential is the sum of free energy of water molecules in pure water and in any other system
(D) Water potential of pure water is zero.

166. Osmosis involves flow of
(A) water without a membrane
(B) solute from a semi-permeable membrane
(C) solvent (H_2O) through a semi-permeable membrane
(D) None of the above.

167. Study the following table showing the components of water potential in closely arranged mesophyll cells namely A, B and C.

Cell	Osmotic Potential MPa	Pressure Potential MPa
A	–0.21	0.05
B	–0.22	0.02
C	–0.23	0.05

Identify two of the following, which show correct direction of water movement between two cells.

I. $A \rightarrow B$ II. $B \rightarrow C$
III. $C \rightarrow A$ IV. $C \rightarrow B$
(A) I, II (B) II, III
(C) I, IV (D) II, IV

168. A cell swells up when kept in
(A) hypotonic solution
(B) hypertonic solution
(C) isotonic solution
(D) All of these

169. Two cells A and B are contiguous. Cell-A has osmotic pressure-10 atm, turgor pressure -7 atm and diffusion pressure deficit-3 atm. Cell-B has os motic pressure-8 atm, turgor pressure-3 atm and diffusion pressure deficit 5 atm. The result will be
(A) movement of water from cell-B to A
(B) no movement of water
(C) equilibrium between the two
(D) movement of water from cell-A to B

170. **Assertion :** When dried seeds of pea are placed in a tin and water added up to their upper level and then a lid is put tightly over it. Within an hour, the lid will be blown off.
Reason : Due to rapid cell division in pea seeds.
(A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(B) Both Assertion and Reason are true but Reason is not correct explanation of Assertion.
(C) Assertion is true but Reason is false
(D) Both Assertion and Reason are false.

171. Root hair absorbs water from soil through
(A) turgor pressure
(B) ion exchange
(C) osmosis
(D) DPD

172. Which one of the following denotes the water potential of the mesophyll cell in wilted condition?
(A) Equal to the value of osmotic potential
(B) Equal to the value of pressure potential
(C) Greater than the value of its osmotic potential
(D) Equal to zero

173. Which of the following maintains the shape of cell?
(A) Osmotic pressure
(B) Turgor pressure
(C) Wall pressure
(D) Osmosis

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174. Identify the correct relationship with reference to water potential of a plant cell.

(A) $\Psi_w = \Psi_m + \Psi_s + \Psi_p$

(B) $\Psi_w = \Psi_m + \Psi_s - \Psi_p$

(C) $\Psi_w = \Psi_m - \Psi_s + \Psi_p$

(D) $\Psi_w = \Psi_m - \Psi_s - \Psi_p$

175. Match the following columns and choose the correct option.

	Column I		Column II
A.	Water potential of 10% salt solution	1.	Positive
B.	Pressure potential in a normal cell	2.	Negative
C.	Pressure potential in a plasmolysed cell	3.	Positive
D.	Metric potential on the surface of the wood	4.	Negative
		5.	Zero

	A	B	C	D
(A)	2	3	5	4
(B)	3	4	2	1
(C)	1	2	4	3
(D)	4	4	2	1

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

Column I	Column II
A. Hypotonic	1. Water
B. Hypertonic	2. Sucrose
C. Solute	3. Lower tonicity
D. Solvent	4. Higher tonicity

	A	B	C	D
(A)	1	2	3	4
(B)	4	2	1	3
(C)	3	4	2	1
(D)	3	1	2	4

177. The values of osmotic potential (π) and pressure potential (ρ) of cells A, B, C and D are given below:

Cell	π	ρ
A	–1.0	0.5
B	–0.6	0.3
C	–1.2	0.6
D	–0.8	0.4

Identify the correct sequence that shows the path of movement of water from among the following :

(A) $D \rightarrow C \rightarrow A \rightarrow B$

(B) $B \rightarrow D \rightarrow A \rightarrow C$

(C) $B \rightarrow C \rightarrow D \rightarrow A$

(D) $C \rightarrow B \rightarrow A \rightarrow D$

178. If water enters in a cell, the pressure exerted by its swollen protoplast is

(A) turgor pressure

(B) DPD

(C) osmotic pressure

(D) imbibition

179. Which of the following statements is correct ?

(A) DPD = OP – WP

(B) DPD = OP + WP

(C) DPD = WP – OP

(D) DPD = TP + OP

180. Which of the following has maximum water potential ?

(A) Pure water

(B) 2% sucrose solution

(C) 4% glucose soltion

(D) 10% sodium chloride solution.

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