TECHNO INDIA GROUP OF PUBLIC SCHOOLS

Dt. 21-01-2026

NEET (XI)

Monthly Mock Test - 7 (2026)

Time Allowed: **3 hours**   Maximum Marks: **720**

General Instructions:

1. This test will be a 3 hours Test, Maximum Marks 720.

2. This test consists of 180 questions of Physics, Chemistry and Biology. All questions are COMPULSORY to attempt.

3. Each question is of 4 marks.

4. There are three parts in the question paper, consisting Part-I Physics (Q. No. 1 to 45), Part-II Chemistry (Q. no. 46 to 90), Part-III Biology (Q. no. 91 to 180).

5. There will be only one correct choice in the given four choices for each question. For each question 4 marks will be awarded for correct choice, 1 mark will be deducted for incorrect choice and zero mark will be awarded for unattenuated question.

6. Any textual, printed or written material, mobile phones, calculator, etc. is not allowed for the students appearing for the test.

7. All calculations / written work should be done in the rough sheet provided.

Physics

1. The velocity v (in cm/s) of a particle is given in terms of time t (in s) by the equation $v = at + \dfrac{b}{t+c}$. The dimensions of a, b and c are

	a	b	c
①	L^2	T	LT^2
②	LT^2	LT	L
③	$LT"^2$	L	T
④	L	LT	I^2

2. The radius of a ball is (2.5 ± 0.2) cm. The percentage error in the volume of the ball is

   ① 11%   ② 24%   ③ 7%   ④ 9%

3. The dimensional formula of force is

   ① $[ML^{-2}]$ ② $[MLT^{-2}]$ ③ $[MLT^{-1}]$ ④ $[LT^{-2}]$

4. Choose incorrect statement/s.

   ① A dimensionally correct equation may be correct

   ② A dimensionally correct equation may be incorrect

   ③ A dimensionally incorrect equation may be correct

   ④ A dimensionally incorrect equation may be incorrect

5. The pitch of the screw gauge is 0.5 mm. Its circular scale contains 50 divisions. The least count of the screw gauge is

   ① 0.001 mm   ② 0.01 mm   ③ 0.02 mm   ④ 0.025 mm

Assertion and Reason :

Directions: Read the following questions and choose any one of the following four responses.

   A: Assertion is true and Reason is true, Reason is the correct explanation of Assertion.

   B: Assertion is true and Reason is true, Reason is not a correct explanation of Assertion.

   C: Assertion is true, Reason is false.

   D: Assertion is false, Reason is true.

6. **Assertion (A):** The error in the measurement of radius of a sphere is 0.3%. The permissible error in its surface area is 0.6%.

   Reason (R) : The permissible error is calculated by the formula $\dfrac{\Delta A}{A} = 4\dfrac{\Delta r}{r}$

   ① A   ② B   ③ C   ④ D

7. An object of weight W and density p is submerged in a fluid of density p_1. Is apparent weight will be

   ① $W(p - p_1)$ ② $\dfrac{(p - p_1)}{W}$ ③ $W\left(1 - \dfrac{p_1}{p}\right)$ ④ $W(p_1 - p)$

8. If two capillary tubes of radii r_1 and r_2 in the ratio 1 : 2 are dipped vertically in water, then the ratio of capillary rises in the respective tubes is

   ① 1 : 4   ② 4 : 1   ③ 1 : 2   ④ 2 : 1

9. Match the columns I and II

	Column - I		Column - II
(A)	Acceleration due to gravity	(p)	$\sqrt{2gR_e}$
(B)	Escape speed	(q)	$-\dfrac{GM_eM}{r}$
(C)	Total energy of a satellite	(r)	GM_eR^2
(D)	Gravitational Potential Energy	(s)	$-\dfrac{GM_eM}{2(R+h)}$

① A – s, B – q, C – p, D – r   ② A – r, B – p, C – s, D – q

③ A – s, B – q, C – s, D – p   ④ A – q, B – s, C – p, D – r

10. If the excess pressure inside a soap bubble of radius r_1 in air is equal to the excess pressure inside air bubble of radius r_2 inside the soap solution, then $r_1 : r_2$ is

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

11. The ratio of radii of gyration of a circular disc and a circular ring of the same radii and mass about a tangential axis perpendicular to plane of disc or ring is

① 1 : 2   ② $\sqrt{5}:\sqrt{6}$ ③ $2:\sqrt{3}$ ④ $\sqrt{3}:2$

12. A mass M is moving with a constant velocity parallel to the x-axis. Its angular momentum w.r.t origin

① is zero   ② remains constant   ③ goes on increasing   ④ goes on decreasing

13. A fly wheel rotates with a uniform angular acceleration. Its angular velocity increase from 20π rad/s to 40π rad/s. s"1 in 10s. How many rotations did it make in this period ?
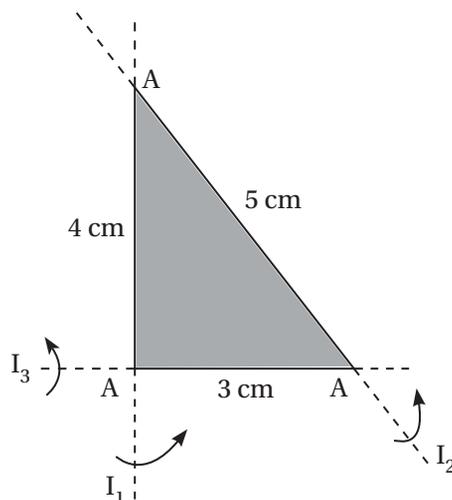
① 80   ② 100   ③ 120   ④ 150

**14.** For the adjoining diagram, ABC is a triangular lamina. The correct relation between I_1, I_2 and I_3 is (I = moment of inertia).


① $I_1 > I_2 > I_3$ ② $I_2 < I_1 < I_3$ ③ $I_2 > I_1 > I_3$ ④ $I_3 > I_2 > I_1$

15. A particle of mass M is situated at the centre of a spherical shell having mass M and radius a. The gravitational potential at a point situated at $\frac{a}{2}$ distance from the centre, will be

① $\frac{3GM}{a}$　　　② $\frac{2GM}{a}$　　　③ $\frac{GM}{a}$　　　④ $-\frac{3GM}{a}$

16. A wire of length L and radius r is clamped at one end. On sttretching the other end of the wire with a force F, the increase in its length is l. If another wire of same material but of length 2L and radius 2r is stretched with a force 2F, the increase in its length will be

① $\frac{l}{4}$　　　② $\frac{l}{2}$　　　③ l　　　④ $2l$

17. The maximum load a wire can withstand without breaking, when its length is reduced to half of its original length, will

① be doubled　　　② behalf　　　③ be four times　　　④ remains same

18. For a satellite moving in an orbit around the earth, the ratio of kinetic energy to magnitude of potential energy is

① $\frac{1}{\sqrt{2}}$　　　② 2　　　③ $\sqrt{3}$　　　④ $\frac{1}{2}$

19. Which of the following is not the property of an ideal fluid ?

① Fluid is incompressible　　　② Fluid is viscous

③ Fl uid flow is irrotational　　　④ Fl uid flow is streamline

20. The level of water in a tank is 5 m high. A hole of area 10 cm^2 is made in the bottom of the tank. The rate of leakage of water from the hole is $(g = 10 \text{ m/s}^2)$

① $10^{-2} \text{m}^3\text{s}^{-1}$　　　② $10^{-3} \text{m}^3\text{s}^{-1}$　　　③ $10^{-4} \text{m}^3\text{s}^{-1}$　　　④ $10^{3} \text{m}^3\text{s}^{-1}$

21. Which of the following graph represents the variations of acceleration due to gravity (g) with distance r from the centre of earth ?
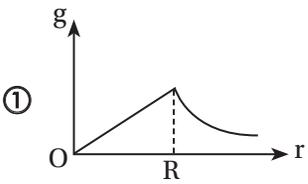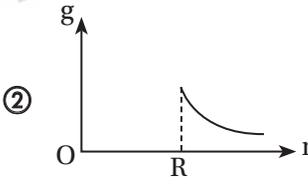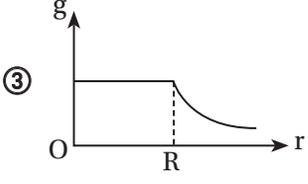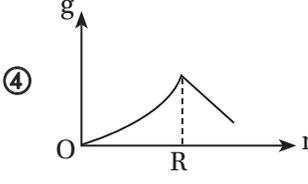
22. Two satellites of earth S_1 and S_2 are moving in the same orbit. The mass of S_1 is 4 times the mass of S_2. Which one of the following statements is true ?

① The potential energies of earth and satellite in the two cases are equal

② S_1 and S_2 are moving with the same speed

③ The kinetic energies of the two satellites are equal

④ The time period of S_1 is 4 times that of S_2

23. Match the Column I and Column II

	Column - I		Column - II
(A)	Floating bodies	(p)	Torricelli's law
(B)	Hydrostatic paradox	(q)	Bernoulli's principle
(C)	Energy conservation	(r)	Archimedes' principle
(D)	Speed of efflux	(s)	Pascal's law

① A – s, B – q, C – r, D – p ② A – r, B – s, C – q, D – q ③ A – q, B – p, C – s, D – r ④ A – s, B – r, C – q, D – p

24. A uniform thin bar of mass 6m and length 12 L is bent to make a regular hexagon. Its moment of inertia about an axis passing through the centre of mass and perpendicular to the plane of hexagon is

① $20\,mL^2$ ② $6\,mL^2$ ③ $\dfrac{12}{5}\,mL^2$ ④ $30\,mL^2$

25. At what height h above the earth's surface the value of g becomes $\dfrac{g}{2}$? [g = gravitational acceleration at the surface of the earth, R = radius of the earth]

① $\left(\sqrt{2}-1\right)R$ ② $\sqrt{2}R$ ③ $\left(\sqrt{2}+1\right)R$ ④ $2R$

26. A rectangular film of liquid is extended from (4 cm × 2 cm) to (5 cm × 4 cm). If the work done is 3×10^{-4} J, the value of the surface tension of the liquid is

① $0.250\,N\,m^{-1}$ ② $0.125\,N\,m^{-1}$ ③ $0.2\,N\,m^{-1}$ ④ $8.0\,N\,m^{-1}$

27. A water barrel having water up to a depth d is placed on a table of height h. A small hole is made on the wall of the barrel at its bottom. If the stream of water coming out of the hole falls on the ground at a horizontal distance R from the barrel, then the value of d is

① $\dfrac{4h}{R^2}$ ② $4hR^2$ ③ $\dfrac{R^2}{4h}$ ④ $\dfrac{h}{4R^2}$

28. Which of the following graphs represents the motion of a planet moving about the sun? (T = Time period, R = Distance between the centres of the sun and planet)
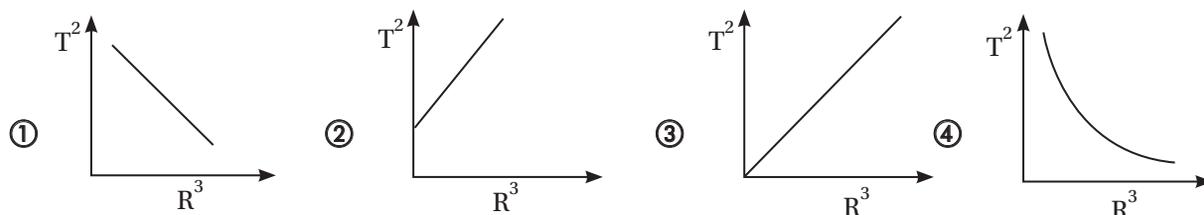
29. The escape velocity from the earth's surface is 11 km/s. the escape velocity from a planet having twice the radius and same mean density as that of earth is

① 5.5 km/s ② 11 klm/s ③ 22 km/s ④ None of these

30. A small spherical ball falling through a viscous medium of negligible density has terminal velocity v. Anoher vall of the same mass but of radius twice that of earlier falling through the same viscous medius will have terminal velocity.

① v ② $\dfrac{v}{4}$ ③ $\dfrac{v}{2}$ ④ None of these

31. When a force is applied on a wire of uniform cross-sectional area 3×10^{-6} m^2 and length 4 m, the increase in length is 1 mm. Energy strored in it will be ($Y = 2 \times 10^{11}\,N/m^2$)

① 6250 J ② 0.177 J ③ 0.075 J ④ 150 J

32. The bulk modulus of a spherical object is 'B'. If it is subjected to uniform pressure 'p', the fractional decrease in radius is

① $\dfrac{B}{3p}$ ② $\dfrac{3p}{B}$ ③ $\dfrac{p}{3B}$ ④ $\dfrac{p}{B}$

These questions consists of two statements, each printed as Assertion (A) and Reason (R).

Assertion and Reason :

Directions: Read the following questions and choose any one of the following four responses.

A: Assertion is true and Reason is true, Reason is the correct explanation of Assertion.

B: Assertion is true and Reason is true, Reason is not a correct explanation of Assertion.

C: Assertion is true, Reason is false.

D: Assertion is false, Reason is true.

33. **Assertion (A):** The stress-strain graphs for two materials A and B are shown in figure. Young's modulus of A is greater than that of B.
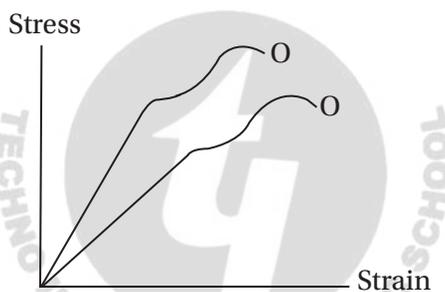
Reason (R) : The Young's modules for small strain is, $Y = \dfrac{\text{stress}}{\text{strain}}$ = slope of linear portion of stress ~ strain graph.

① A ② B ③ C ④ D

34. Two particles each of mass m are kept at a separation d. Under the action of their mutual gravitational attraction, the particles are rotating in a circular path about the centre of mass of the system. Then the speed of each particle.
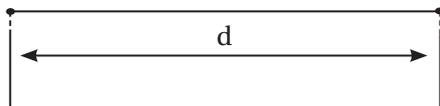
① $\sqrt{\dfrac{Gm}{2d}}$ ② $\sqrt{\dfrac{Gm}{d}}$ ③ $\sqrt{\dfrac{2Gm}{d}}$ ④ $\sqrt{\dfrac{Gm}{4d}}$

35. If 100 N force acts on a surface of area 25 m^2 making an angle 30° with the surface, the pressure exerted on the surface is

① 1 Pa ② 2 Pa ③ 3 Pa ④ 4 Pa

36. N division on a main scale of a vernier calipers coincides with (N + 1) divisions on its vernier scale. If each division of main scale is of 'a' unit, then the least count of vernier calipers is

① $\dfrac{a}{N}$ ② $\dfrac{a}{N+1}$ ③ $\dfrac{a}{N-1}$ ④ None of these

Assertion and Reason :

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D: Assertion is false, Reason is true.

37. **Assertion (A) :** When percentage errors in measurement of mass and velocity are 1 % and 2% respectively, the maximum percentage error in kinetic energy (KE) is 5%.

Reason (R) : $KE = \dfrac{1}{2}mv^2, \dfrac{\Delta KE}{KE} = \dfrac{\Delta m}{m} + \dfrac{2\,\Delta v}{v}$

① A ② B ③ C ④ D

38. From a circular disc of radius R and mass 9M, a small disc of radius R/3 is removed as shown in figure. The moment of inertia of the remaining disc about an axis perpendicular to the plane of the disc and passing through O is
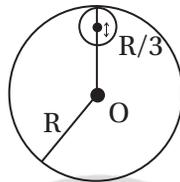
① $4MR^2$ ② $\dfrac{40}{9}MR^2$ ③ $40MR^2$ ④ $\dfrac{37}{9}MR^2$

39. A rope is wound around a hollow cylinder of mass 3 kg and radius 40 cm. If the rope is pulled with a force of 30 N, angular acceleration of the cylinder will be

① $10\ rad\ s^{-2}$ ② $15\ rad\ s^{-2}$ ③ $20\ rad\ s^{-2}$ ④ $25\ rad\ s^{-2}$

40. The change in potential energy when a body of mass m is raised to a height nR from the earth's surface is (R = Radius of Earth)

① $mgR\left(\dfrac{n}{n-1}\right)$ ② mgR ③ $mgR\dfrac{n}{n+1}$ ④ $\dfrac{mgR}{n}$

41. Three uniform spheres of mass M and radius R each are kept in such a way that each touches the other two. The magnitude of gravitational force on any of the spheres due to other two is

① $\dfrac{\sqrt{3}GM^2}{2R^2}$ ② $\dfrac{3GM^2}{2R^2}$ ③ $\dfrac{\sqrt{3}GM^2}{R^2}$ ④ $\dfrac{3GM^2}{4R^2}$

42. The cylindrical tube of a spray pump has radius R. One end of which has n fine holes, each of radius r. If the speed of the liquid in the tube is V, the speed of the ejection of the liquid through the hole is

① $\dfrac{VR^2}{n^3r^2}$ ② $\dfrac{V^2R}{nr}$ ③ $\dfrac{VR^2}{n^2r^2}$ ④ $\dfrac{VR^2}{nr^2}$

43. An object floats in water with 10% of its volume outside and in oil 30% of its volume outside. The specific gravity of the oil is

① 1.3 ② 0.8 ③ 2 ④ 7

44. A square plate of side 0.1 m moves parallel to an identical second plate with a relative velocity of 0.1 ms^{-1}. Both plates immersed in water. If the viscous force is 0.002 N and the coefficient of viscosity 0.001 poise, then distance between the plates is

① $5 \times 10^{-5}\ m$ ② $1 \times 10^{-5}\ m$ ③ $5 \times 10^{-6}\ m$ ④ $5 \times 10^{-4}\ m$

45. Two wires of same material and length but diameters in the ratio 1 : 2 are stretched by the same force. The potential energy per unit volume for the two wires when stretched will be in the ratio.

① 16 : 1 ② 4 : 1 ③ 2 : 1 ④ 1 : 1

CHEMISTRY

Choose the correct answer:

46. The incorrect equality among the following is

① Mass of one Ca atom = $\dfrac{40}{N_A}$ g

② 1.6 g CH_4 = N_A electrons of CH_4

③ 100 u He = 25 atoms of He

④ 1 g-atom of He = 1 g He

47. Molarity of an aqueous solution having mole fraction of solvent as 0.95 is approximately

① 2   ② 3   ③ 4   ④ 5

48. Which of the following are isotones?

① $_{32}^{76}Ge, _{32}^{77}Ge, _{33}^{77}As$

② $_{32}^{76}Ge, _{33}^{77}As, _{34}^{78}Se$

③ $_{32}^{77}Ge, _{33}^{77}As, _{34}^{77}Se$

④ $_{33}^{77}As, _{34}^{77}Se, _{34}^{78}Se$

49. According to Bohr's theory radius of nth shell is given as $\dfrac{1}{r_n} \propto Z^y$ (Z is atomic number)

Here 'y' is

① 1   ② –1   ③ 2   ④ –2

50. Sulphate of a metal contains 40% of metal by mass Equivalent *wt.* of metal will be

① 16   ② 32   ③ 35   ④ 64

51. If an element z having atomic weight x exists in two isotopes of mass number $(x – 1)$ and $(x + 2)$ then the percentage abundance of heavier isotope is

① 25%   ② 66.6%   ③ 33.3%   ④ 20%

52. Orbital which is represented by $\psi_{4,2,0}$ is

① 5f   ② $4d_{z^2}$ ③ 4s   ④ $5p_z$

53. 10 g of $KClO_3$, is strongly heated in a vessel which partially decomposes as, $2KClO_3 \rightarrow 2KCl + 3O_2$ and rest as $4KClO_3 \rightarrow 3KClO_4 + KCl$. If 9.52 g of solid residue is left in vessel by end of reaction, then how much oxygen gas has escaped out?

① 0.48 g   ② 0.24 g   ③ 9.6 g   ④ 0.89 g

54. Cathode rays are made up of electrons and anode 9 rays are made up of _____.

① Neutrons only

② Protons only

③ All positive particles present in atoms only

④ Cations only

55. Dual character of electron was given by

① de-Broglie   ② Rutherford   ③ Einstein   ④ Goldstein

56. The correct statement for the following reaction is

$H_3PO_4 + M(OH)_2 \rightarrow MHPO_4 + 2H_2O$

① $E_{base} = \dfrac{Molecular\ weight\ of\ base}{2}$

② $E_{H_3PO_4} = \dfrac{98}{3}$

③ Resulting solution require $\dfrac{1}{2}$ mole of NaOH for complete neutralisation

④ Minimum 1 mole of $M(OH)_2$ is required for complete neutralisation of $MHPO_4$

57. Which of the following has largest ionic radii?

① F^- ② Br^- ③ H^- ④ Cl^-

58. Which of the following species shows maximum electronegativity of oxygen?

① H_2O ② ^-OH

③ H_3O^+ ④ All have same electronegativity

59. Find out the correct statements

a. For Inert gases, atomic radii means van der Weal's radii

b. Chlorine possess most negative electron gain enthalpy among halogens

c. Be possesses positive electron gain enthalpy

① a and b only   ② a, b and c   ③ b and c only   ④ a and c only

60. Which has least ionisation enthalpy?

① Al   ② Ga   ③ ln   ④ Ti

61. Which of the following is/are polar in nature?

①   ②   ③   ④ Both ② and ③

62. Planar molecule(s) among the following is/are

① CO_3^{2-} ② BF_3 ③ XeF_4 ④ All of these

63. Electronegativity of Be and Cl are 1.5 and 3.0 respectively. Covalent radii of Be and Cl are 111 and 99 pm respectively. Using the data select incorrect statement in the following

① Bond length of Be-Cl bond is 209.86 pm   ② Bond length of Be-Cl bond is 210 pm

③ Be-Cl bond is polar in nature   ④ $BeCl_2$, molecule is non-polar in nature

64. Which of the following pair have nearly the same atomic radii?

① Zn, Mo   ② Co, Ni   ③ Zn, Cd   ④ Ti, HE

65. 'Bridge elements' term is used for elements which belong to

① 1st period   ② 5th period   ③ 3rd period   ④ 4th period

66. Arrange Si, Be, Mg, Na and P in the increasing order of metallic character

① P < Si < Be < Mg < Na   ② Na < Mg < Be < Si < P   ③ P < Si < Na < Mg < Be   ④ Si < P < Mg < Na < Be

67. Pair of species showing sp^2 hybridisation of central atom is

① SO_3, NH_4^+, NO_3^- ② SO_3, NO_3^-, C_2H_4 ③ C_2H_4, SO_2, H_2O ④ NO_2^+, NO_3^-, SO_3

68. Which of the following species possess unequal bonds lengths?

① SiF_4 ② XeF_4 ③ BF_4^- ④ SF_4

69. Which of the following statements is not true on the basis of hydrogen bonding?

① Boiling point of alcohols is more than that of corresponding thiols and ethers

② Boiling point of glycerol is less than that of ethylene glycol

③ H-bond is weaker than covalent bond

④ H-bonding is a type of dipole interactions

70. Incorrect order of bond angles is

① $H_2O > OF_2$ ② $PF_3 > PCl_3$ ③ $NO_2 > NO_2^-$ ④ $NH_3 > PH_3$

71. Compound with highest lattice enthalpy is

① KBr ② MgO ④ SrO ③ LiF

72. The percentage of p-character in the orbitals of P_4 molecule is

① 50% ② 75% ③ 60% ④ 66.6%

73. Select the incorrect order

① $O_2 < O_3 < H_2O_2$ … (O—O bond length) ② $CO < CO_2 < CO_3^{2-}$ … (C—O bond length)

③ $NH_3 > NF_3 > BF_3$ … (Dipole moments) ④ $HF > HCl > HBr$ … (Boiling points)

74. Which of the following is good conductor of electricity?

① Solid NaCl ② CO_2 ③ Graphite ④ Benzene

75. Proton can participate in .... bonding.

① Hydrogen ② Ionic ③ Covalent ④ Coordinate

76. If standard entropies of N_2, H_2 and NH_3 are 60, 40 and 50 J K^{-1} mol^{-1} respectively and enthalpy of formation of NH_3 is –30 kJ mol^{-1}, then the temperature at which reaction for formation of ammonia will be at equilibrium is

① 227°C ② 477°C ③ 750°C ④ 900°C

77. The reaction $2A(g) \longrightarrow A_2(g)$, will be spontaneous

① At high temperature ② At low temperature

③ At all temperatures ④ Never at any temperature

78. Units of Van der Waal's constant a is/are

① atm L^2 mol^{-2} ② N m^4 mol^{-2} ③ dyne cm^4 mol^{-2} ④ All of these

79. Incorrect statement among the following is

① Absolute temperature scale is the result of Charle's law

② Jet aeroplane flying at high altitude need pressurizaion cabins

③ High density of air at sea level is a practical example of Boyle's law

④ Boyle's law is applicable under adiabatic conditions only

80. Universal gas constant is not equal to

① 1.988 cal K^{-1} mol^{-1} ② 8.314×10^7 ergs K^{-1} mol^{-1}

③ 5.189×10^{19} eV K^{-1} mol^{-1} ④ 8.314 atm K^{-1} mol^{-1}

81. When a fixed mass of gas a 30°C is heated to double the temperature i.e. 60°C at constant pressure then its volume

① Becomes double ② increases to same extent as the temperature

③ Increases but to different extent of the temperature ④ Increases five times

82. The entropy changes when 1 mole of ideal gas at 27°C is expanded reversibly from 2 litre to 20 litre is

① 2 cal K^{-1} mol^{-1} ② 4.6 cal K^{-1} mol^{-1} ③ 4 J K^{-1} mol^{-1} ④ 4.6 KJ K^{-1} mol^{-1}

83. The enthalpy of formation of $NCl_3(g)$ using given data is

$NH_3(g) + 3Cl_2(g) \rightleftharpoons NCl_3(g) + 3HCl(g)$, $\Delta H_1 = -x_1$

$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$, $\Delta H_2 = -x_2$

$H_2(g) + Cl_2(g) \rightleftharpoons 2HCl(g)$, $\Delta H_3 = x_3$
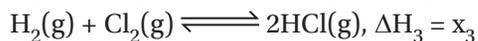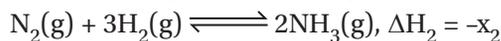
① $\Delta H_f = -x_1 + \dfrac{x_2}{2} - \dfrac{3}{2}x_3$ ② $\Delta H_f = x_1 + \dfrac{x_2}{2} + \dfrac{3}{2}x_3$ ③ $\Delta H_f = x_1 - \dfrac{x_2}{2} - \dfrac{3}{2}x_3$ ④ $\Delta H_f = -x_1 - \dfrac{x_2}{2} - \dfrac{3}{2}x_3$

84. In a constant volume calorimeter, 3.5 g of carbon monoxide was burnt in excess of air at 25°C. If rise in temperature of calorimeter was by 0.5 degree then, the change in internal energy of gas during combustion is (given heat capacity of calorimeter is $2500\ J\ K^{-1}$)

① $-9\ KJ\ mol^{-1}$ ② $-10\ KJ\ mol^{-1}$ ③ $-100\ KJ\ mol^{-1}$ ④ $-31.25\ KJ\ mol^{-1}$

85. Find out the incorrect match.

① $SO_2(g)$ – (dipole-dipole forces)   ② $NaCl$ in H_2O – (ion-dipole forces)

③ C_6H_6 – (dispersion forces)   ④ $HCl(g)$ – (ionic forces)

In he following questions (41 to 60), a statement of assertion (A) is followed by a statement of reason (R).

(1) If both Assertion & Reason are true and the reason is he correct explanation of the assertion, then mark (1).

(2) If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2).

(3) If Assertion is true statement but Reason is false, then mark (3)

(4) If both Assertion and Reason are false statements, then mark (4)

86. **Assertion (A) :** Scientific notation for 0.00016 can be written as 1.6×10^{-4}

Reason (R) : Zeros preceding to first non-zero digit are not significant.

① (1)   ② (2)   ③ (3)   ④ (4)

87. **Assertion (A) :** CuO and Cu_2O illustrate the law of multiple proportion.

Reason (R) : Percentage of copper and oxygen in samples of CuO obtained by different methods were found to be same.

① (1)   ② (2)   ③ (3)   ④ (4)

88. **Assertion (A) :** Equal volumes of different gases contain equal number of atoms at same temperature and pressure.

Reason (R) : 100 ml of hydrogen combine with 100 ml of oxygen to form 100 ml of water vapour.

① (1)   ② (2)   ③ (3)   ④ (4)

89. **Assertion (A) :** Boundary surface diagram for a s-orbital is a sphere centred on the nucleus.

Reason (R) : s-orbital encloses a region in which probability of finding the electron is about 90%.

① (1)   ② (2)   ③ (3)   ④ (4)

90. **Assertion (A) :** Number of photons of light having wave number x in 1 joule of energy source is hcx (h is Planck's constant).

Reason (R) : Energy of electron in n^{th} shell of H-atom is given as $E_n = \dfrac{-1312}{n^2}\ kcal\ mol^{-1}$.

① (1)   ② (2)   ③ (3)   ④ (4)

Biology

91. Which kingdom does Euglena belong to as per Whittaker's classification?

   ① Plantae   ② Protista   ③ Monera   ④ Fungi

92. Which of the following is a characteristic feature of Monera?

   ① Eukaryotic cells   ② Multicellular body

   ③ Presence of nuclear membrane   ④ Absence of membrane-bound organelles

93. Which of the following structures is absent in cyanobacteria?

   ① Cell wall   ② Plasma membrane   ③ Nucleus   ④ Ribosomes

94. The pacemaker of the human heart is:

   ① AV node   ② Purkinje fibers   ③ SA node   ④ Bundle of His

95. Which part of the brain controls voluntary movements?

   ① Medulla oblongata   ② Cerebellum   ③ Pons   ④ Cerebrum

96. Which of the following is a non-vascular plant?

   ① Fern   ② Moss   ③ Cycas   ④ Pine

Assertion and Reason :

  Directions: Read the following questions and choose any one of the following four responses.

   A: Assertion and Reason both are correct and Reason is the correct explanation of Assertion.

   B: Assertion and Reason both are correct and Reason is not the correct explanation of Assertion.

   C: Assertion is correct but Reason is wrong.

   D: Assertion is wrong but Reason is correct.

97. **Assertion (A):** Binomial nomenclature is universally accepted.

  Reason (R) : It gives a unique scientific name to each organism.

   ① A   ② B   ③ C   ④ D

98. **Assertion (A):** Heart is myogenic.

  Reason (R) : Impulse originates from SA node.

   ① A   ② B   ③ C   ④ D

99. **Assertion (A):** Insulin lowers blood glucose level.

  Reason (R) : It promotes glycogen breakdown.

   ① A   ② B   ③ C   ④ D

100. **Assertion (A):** Gibberellins promote stem elongation.

  Reason (R) : They increase cell division and elongation.

   ① A   ② B   ③ C   ④ D

101. **Assertion (A):** Neurons do not divide.

  Reason (R) : They do not have the S phase in their life cycle.

   ① A   ② B   ③ C   ④ D

102. **Assertion (A):** Plasma proteins help in blood clotting.

Reason (R): Fibrinogen converts into fibrin.

① A   ② B   ③ C   ④ D

103. **Assertion (A):** Pulmonary artery carries oxygenated blood.

Reason (R): It carries blood from heart to lungs.

① A   ② B   ③ C   ④ D

104. A patient has low hemoglobin and feels fatigue. The condition is called:

① Leukemia   ② Anemia   ③ Polycythemia   ④ Thrombosis

105. Normal haemoglobin in adult female is about:

① 5–7 g/dL   ② 8–10 g/dL   ③ 12–16 g/dL   ④ 18–20 g/dL

106. Hormone increasing RBC formation:

① Thyroxine   ② Erythropoietin   ③ Insulin   ④ ADH

107. Which division of the plant kingdom includes liverworts and hornworts?

① Pteridophyta   ② Gymnosperms   ③ Bryophyta   ④ Angiosperms

108. In algae, sexual reproduction is:

① Absent   ② Only isogamous

③ Always oogamous   ④ Highly variable (isogamy, anisogamy, oogamy)

109. Which mineral is essential for muscle contraction?

① Iron   ② Potassium   ③ Calcium   ④ Magnesium

110. The functional unit of a muscle is:

① Myofibril   ② Sarcomere   ③ Actin   ④ Myosin

111. Which part of the brain controls balance and posture?

① Medulla   ② Cerebrum   ③ Cerebellum   ④ Thalamus

112. Which type of neuron carries impulses from receptors to the central nervous system?

① Motor neuron   ② Sensory neuron   ③ Relay neuron   ④ Interneuron

113. In aerobic respiration, the net gain of ATP per glucose molecule is:

① 2   ② 36   ③ 38   ④ 4

114. The common step in aerobic and anaerobic respiration is:

① Krebs cycle   ② Glycolysis

③ Electron transport   ④ Oxidative phosphorylation

115. The first stable product of C3 cycle is:

① PGA   ② PEP   ③ Pyruvate   ④ RuBP

116. In C4 plants, the site of Calvin cycle is:

① Mesophyll cells   ② Bundle sheath cells   ③ Guard cells   ④ Epidermal cells

117. Chlorophyll a shows maximum absorption in:

① Red and blue light   ② Green light   ③ Yellow and red light   ④ UV light

118. Which part of the nephron is responsible for reabsorption of glucose?

① Collecting duct ② Proximal convoluted tubule
③ Distal convoluted tubule ④ Loop of Henle

119. The hormone responsible for cell elongation is:

① Cytokinin ② Auxin ③ ABA ④ Ethylene

120. Which hormone promotes seed dormancy?

① GA ② Auxin ③ ABA ④ Cytokinin

121. Mycoplasma differs from other bacteria in:

① Having no cell wall ② Being eukaryotic
③ Having nucleus ④ Performing photosynthesis

122. Pneumatophores are found in:

① Desert plants ② Aquatic plants ③ Mangrove plants ④ Hydrophytes

123. A modified stem that stores food is:

① Corm ② Petiole ③ Leaflet ④ Stolon

124. A compound leaf is one in which:

① Leaf is folded ② Leaflet has separate axil
③ Lamina is divided into leaflets ④ Lamina is undivided

125. The fluid mosaic model of plasma membrane was proposed by:

① Singer and Nicolson ② Robertson
③ Watson and Crick ④ Schleiden and Schwann

126. Ribosomes are absent in:

① Mitochondria ② Nucleus ③ Prokaryotic cells ④ Mature RBCs

127. The longest phase of the cell cycle is:

① G1 phase ② M phase ③ G2 phase ④ S phase

128. Crossing over takes place during:

① Metaphase I ② Anaphase I ③ Zygotene ④ Pachytene

129. Synapsis occurs during:

① Metaphase I ② Anaphase II ③ Zygotene ④ Pachytene

130. The part of the brain that regulates heartbeat and breathing is:

① Cerebellum ② Medulla oblongata ③ Pons ④ Hypothalamus

131. Which ion is essential for nerve impulse transmission?

① Mg^{2+} ② Ca^{2+} ③ Fe^{2+} ④ Zn^{2+}

132. The hepatic portal vein drains blood to liver from___

① Heart ② Intestine ③ Stomach ④ Kidney

133. The universal donor blood group is:

① AB^+ ② O^- ③ A^+ ④ B^-

134. Double circulation means:

① Blood passes twice through lungs

② Blood flows twice through the heart in one cycle

③ Heart has two chambers cycles

④ Blood flows twice through the heart in two

135. The maximum volume of air a person can expel after maximum inhalation is called:

① Vital capacity

② Tidal volume

③ Residual volume

④ Inspiratory reserve volume

136. Oxygen is transported in blood mainly by:

① Plasma　② Leucocytes　③ Haemoglobin　④ Platelets

137. Which enzyme converts CO_2 into bicarbonate ions in RBCs?

① Carboxylase　② Carbonic anhydrase　③ Peroxidase　④ Catalase

138. The sliding filament theory explains:

① Bone elongation　② Muscle contraction　③ Joint movement　④ Ligament function

139. Which of the following changes will occur if hemoglobin level suddenly decreases?

① Increase in blood pH

② Decrease in oxygen diffusion in tissues

③ Increase in RBC lifespan

④ Increase in partial pressure of oxygen in tissues

140. Which statement regarding oxygen dissociation curve is correct?

① Curve shifts left with increased CO_2

② Curve shifts right with decreased temperature

③ Curve shifts right during exercise

④ Curve is linear in nature

141. Which of the following is NOT a function of kidneys?

① Regulation of blood pressure

② Regulation of erythropoiesis

③ Regulation of blood glucose

④ Regulation of osmotic balance

142. Which of the following increases the rate of glomerular filtration?

① Constriction of afferent arteriole

② Constriction of efferent arteriole

③ Decrease in blood pressure

④ Decrease in plasma proteins

143. Which of the following parts of a nephron is most permeable to water?

① Ascending limb of Henle

② Descending limb of Henle

③ DCT

④ Collecting duct

144. The pacemaker potential is generated due to:

① Na^+ influx only

② K^+ efflux only

③ Slow depolarization of SA node

④ Action potential of AV node

145. Which factor does NOT affect heart rate?

① Autonomic nervous system

② Electrolyte concentration

③ Blood viscosity

④ Body temperature

146. Which blood vessel normally carries deoxygenated blood?

① Pulmonary vein　② Coronary artery　③ Hepatic vein　④ Renal artery

147. Which event occurs during ventricular systole?

① Opening of AV valves
② Closing of semilunar valves
③ Opening of semilunar valves
④ Filling of atria

148. Which hormone deficiency leads to diabetes insipidus?

① Insulin
② ADH
③ Aldosterone
④ Thyroxine

149. Which of the following is an involuntary striated muscle?

① Skeletal muscle
② Smooth muscle
③ Cardiac muscle
④ Voluntary muscle

150. The sliding filament theory involves:

① Shortening of actin filaments
② Shortening of myosin filaments
③ Overlapping of actin and myosin
④ Breakdown of sarcomere

151. Which ion is released from sarcoplasmic reticulum during muscle contraction?

① Na^+
② K^+
③ Ca^{2+}
④ Mg^{2+}

152. Which part of brain controls voluntary actions?

① Medulla
② Cerebellum
③ Cerebrum
④ Hypothalamus

153. Which hormone shows diurnal rhythm?

① Melatonin
② Insulin
③ ADH
④ Cortisol

Assertion and Reason:

Directions: Read the following questions and choose any one of the following four responses.

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C: Assertion is correct but Reason is wrong.

D: Assertion is wrong but Reason is correct.

154. Assertion (A): Insulin deficiency causes hyperglycemia.

Reason (R): Cells fail to uptake glucose efficiently.

① A
② B
③ C
④ D

155. Assertion (A): Cardiac muscle does not fatigue.

Reason (R): It has rich blood supply and mitochondria.

① A
② B
③ C
④ D

156. Assertion (A): Renin is secreted when blood pressure falls.

Reason (R): Renin increases aldosterone secretion indirectly.

① A
② B
③ C
④ D

157. Assertion (A): AV node delays impulse conduction.

Reason (R): It allows ventricles to fill completely.

① A
② B
③ C
④ D

158. A mountaineer at high altitude experiences breathlessness.

Primary cause of breathlessness:

① Low CO_2 ② Low oxygen pressure ③ High blood pressure ④ High haemoglobin

159. Immediate physiological response:

① Decreased breathing rate ② Increased RBC destruction

③ Increased breathing rate ④ Decreased haemoglobin affinity

160. Long-term adaptation includes increase in:

① Platelets ② WBCs ③ RBC count ④ Plasma volume

161. Which hormone stimulates RBC formation?

① Thyroxine ② Erythropoietin ③ Insulin ④ ADH

162. Which statement is incorrect regarding modifications of roots?

① Pneumatophores possess lenticels

② Prop roots provide mechanical support

③ Nodulated roots occur due to *Rhizobium* infection

④ Storage roots arise from adventitious roots only

163. A leaf showing parallel venation, sheathing leaf base, and ligule is most likely from:

① Mustard ② Pea ③ Wheat ④ Cotton

164. In which of the following flowers is the placentation free-central?

① Tomato ② China rose ③ Dianthus ④ Mustard

165. Epipetalous stamens are found in:

① Mustard ② Brinjal ③ China rose ④ Pea

166. Which inflorescence shows indefinite growth of main axis with flowers in acropetal succession?

① Cymose ② Solitary ③ Racemose ④ Hypanthodium

167. A flower that is zygomorphic, hypogynous and pentamerous is seen in:

① Pea ② Mustard ③ Tomato ④ Sunflower

168. Which tissue is absent in monocot stem?

① Hypodermis ② Pith ③ Endodermis ④ Vascular bundles

169. The Casparian strips are found in:

① Cortex ② Endodermis ③ Pericycle ④ Pith

170. Which element of xylem is living at maturity?

① Tracheid ② Vessel ③ Xylem fibre ④ Xylem parenchyma

171. Companion cells are absent in:

① Angiosperms ② Gymnosperms ③ Monocots ④ Dicots

172. Which pigment shows maximum absorption in blue region?

① Chlorophyll a ② Chlorophyll b ③ Carotene ④ Xanthophyll

173. Photorespiration occurs in:

① Mitochondria only

② Chloroplast only

③ Peroxisome only

④ Chloroplast, peroxisome and mitochondria

174. The number of ATP molecules required to synthesize one glucose molecule in C_4 plants is:

① 12

② 18

③ 24

④ 30

175. Which factor does **not** affect photosynthesis directly?

① Light

② CO_2 concentration

③ Temperature

④ Oxygen concentration

176. Which step of respiration produces CO_2 for the first time?

① Glycolysis

② Link reaction

③ Krebs cycle

④ ETS

177. $FADH_2$ is generated during:

① Glycolysis

② Link reaction

③ Krebs cycle

④ ETS

178. The cork cambium, cork and secondary cortex are collectively called:

① Phellem

② Phelloderm

③ Phellogen

④ Periderm

179. Which purine bases found in RNA?

① Thymine

② Uracil

③ Cytosine

④ Guanine

180. Trachea of cockroach and man are similar in having:

① Non-collapsible walls

② Paired nature

③ Ciliated inner lining

④ Origin from lead