TECHNO INDIA GROUP OF PUBLIC SCHOOLS

Dt. 29-08-2025

NEET (XI)

Monthly Mock Test - 2 (29.08.2025)

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 <u>4 marks will be</u> awarded for correct choice, <u>1 mark will be deducted</u> 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. A sphere cannot roll on :

   ① a smooth horizontal surface   ② a smooth inclined surface

   ③ a rough horizontal surface   ④ a rough inclined surface

2. Two spheres of unequal mass but of same radius are released on an inclined plane. They rolls down without slipping. Which one will reach the ground first?

   ① Lighter sphere   ② Heavier sphere

   ③ Both will reach at the same time   ④ None of the above

3. A solid cylinder of mass M and radius R rolls without slipping down an inclined plane of length L and height h. What is the speed of its center of mass when the cylinder reaches its bottom?

   ① $\sqrt{\dfrac{3}{4}gh}$ ② $\sqrt{\dfrac{4}{3}gh}$ ③ $\sqrt{4gh}$ ④ $\sqrt{2gh}$

4. A body is rolling down an inclined plane. Its translational and rotational kinetic energies are equal. Then the body is a :

   ① solid sphere   ② hollow sphere   ③ solid cylinder   ④ hollow cylinder

5. In figure the velocities are in ground frame and the cylinder is performing pure rolling on the plank, velocity of point A would be :

   ① $2v_C$ ② $2v_C + v_P$

   ③ $2v_C - v_P$ ④ $2(v_C - v_P)$

6. A small object of uniform density rolls up a curved surface with an initial velocity v. It reaches upto a maximum height of $\dfrac{3v^2}{4g}$ with respect to the initial position. The object is

   ① ring   ② solid sphere

   ③ hollow sphere   ④ disc
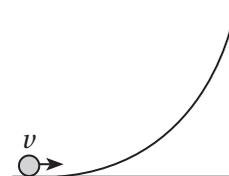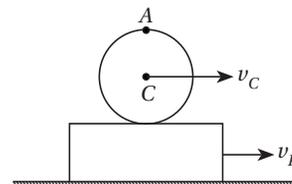
7. Given below are two statements :

   Statement I : A rigid body is said to be in rotational equilibrium, if the vector sum of total torque acting on the rigid body is zero.

   Statement II : A solid homogeneous sphere is rolling with sliding on a rough horizontal surface. During this motion, the angular momentum of the sphere about the point of contact with the plane is conserved.

   In the light of the above statements, choose the most appropriate answer from the options given below :

   ① Statement I is incorrect but Statement II is correct.

   ② Both Statement I and Statement II are correct.

   ③ Both statement I and Statement II are incorrect.

   ④ Statement I is correct but Statement II is incorrect.

8. A disc is pure rolling, the velocity of its centre of mass is v_{CM}. Which one will be correct?

① The velocity of highest point is $2v_{CM}$ and at the point of contact is zero.

② The velocity of highest point is v_{CM} and at the point of contact is v_{CM}.

③ The velocity of highest point is $2v_{CM}$ and at the point of contact is v_{CM}.

④ The velocity of highest point is $2v_{CM}$ and at the point of contact is $2v_{CM}$.

9. A disc of mass 3 kg rolls down an inclined plane of height 5 m without slipping. The translational kinetic energy of the disc on reaching the bottom of the inclined plane is

① 50 J ② 100 J ③ 150 J ④ 175 J

10. A solid sphere of mass m rolls without slipping on an inclined plane of inclination 45°. The linear acceleration of the sphere is

① $\dfrac{g}{7\sqrt{2}}$ ② $\dfrac{2g}{7\sqrt{2}}$ ③ $\dfrac{3g}{7\sqrt{2}}$ ④ $\dfrac{5g}{7\sqrt{2}}$

11. Match Column-I with Column-II

|	**Column-I**		**Column-II**
(a)	Elastic collision	(p)	$e = 0$
(b)	Inelastic collision	(q)	$0 < e < 1$
(c)	Explosion	(r)	$e = 1$
(d)	Plastic collision	(s)	Final K.E. > initial K.E.

① (a → p); (b → q); (c → r); (d → s)   ② (a → r); (b → p); (c → q); (d → s)

③ (a → s); (b → r); (c → q); (d → p)   ④ (a → r); (b → q); (c → s); (d → p)

12. A ball of mass 1 kg is attached to an inextensible string. The ball released from the position shown in figure. The impulse imparted by the string to the ball just after string becomes taut is ($g = 10$ m/s²)

① $\sqrt{40}$ N-s ② $\sqrt{20}$ N-s
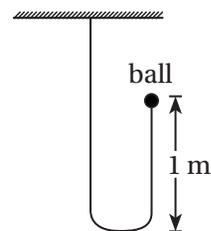
③ $\sqrt{10}$ N-s ④ None of these

13. An object of mass 80 kg moving with velocity 2 m/s hit by collides with another object of mass 20 kg moving with velocity 4 m/s. Find the loss of energy assuming a perfectly inelastic collision.

① 12 J ② 24 J ③ 30 J ④ 32 J

14. A steel ball is moving with a velocity of 4 m/s. It makes an oblique collision with a stationary identical ball and the collision is elastic. If the velocity vector of the first ball after the impact makes an angle of 30° with its original direction of motion find its final velocity

① $2\sqrt{3}$ m/s ② $\dfrac{2}{\sqrt{3}}$ m/s ③ $\dfrac{3\sqrt{3}}{2}$ m/s ④ $\sqrt{3}$ m/s

15. A ball of mass 50 g is dropped from a height of 20 m. A boy on the ground hits the ball vertically upwards with a bat with an average force of 200 N, so that it attains a vertical height of 45 m. The time for which the ball remains in contact with the bat is [Take $g = 10$ m/s²]

① $\dfrac{1}{20}$ s ② $\dfrac{1}{40}$ s ③ $\dfrac{1}{80}$ s ④ $\dfrac{1}{120}$ s

16. A ball of mass m moving with speed u collides with a smooth horizontal surface at an angle θ with it as shown in figure. The magnitude of impulse imparted to surface by ball is [Coefficient of restitution of collision is e]
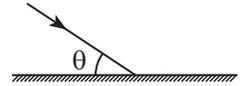
① $mu(1+e)\cos\theta$ ② $mu(1-e)\cos\theta$ ③ $mu(1+e)\sin\theta$ ④ $mu(1-e)\sin\theta$

17. An object of mass $3m$ splits into three equal fragments. Two fragments have velocities $v\hat{j}$ and $v\hat{i}$. The velocity of the third fragments is

① $v(\hat{i}-\hat{j})$ ② $v(\hat{j}-\hat{i})$ ③ $-v(\hat{i}+\hat{j})$ ④ $\dfrac{v(\hat{i}+\hat{j})}{\sqrt{2}}$

18. Four particles of masses m, $2m$, $4m$ and $8m$ are placed at the corners of a square of side a. The co-ordinates of centre of mass is

① $\left(\dfrac{a}{\sqrt{2}}, \dfrac{a}{\sqrt{2}}\right)$ ② $\left(\dfrac{a}{2}, \dfrac{3a}{4}\right)$ ③ $\left(\dfrac{a}{5}, \dfrac{2a}{5}\right)$ ④ $\left(\dfrac{2a}{5}, \dfrac{4a}{5}\right)$

19. A man is walking on a road with a velocity 3 km/h. Suddenly rain starts falling. The velocity of rain is 10 km/h in vertically downward direction. The relative velocity of rain is :

① $\sqrt{13}$ km/h ② $\sqrt{109}$ km/h ③ $\sqrt{7}$ km/h ④ 13 km/h
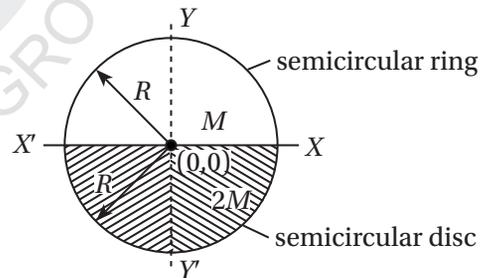
20. Four particles of masses m, $2m$, $4m$ and $8m$ are placed at the corners of a square of side a. The co-ordinates of centre of mass is

① $\left(\dfrac{a}{\sqrt{2}}, \dfrac{a}{\sqrt{2}}\right)$ ② $\left(\dfrac{a}{2}, \dfrac{3a}{4}\right)$ ③ $\left(\dfrac{a}{5}, \dfrac{2a}{5}\right)$ ④ $\left(\dfrac{2a}{5}, \dfrac{4a}{5}\right)$

21. A system if formed as shown below.

The centre of mass of the system is

① $\left[\dfrac{2R}{8\pi}, 0\right]$ ② $\left[0, \dfrac{2R}{9\pi}\right]$

③ $\left[0, \dfrac{9\pi}{2R}\right]$ ④ $\left[\dfrac{8\pi}{2R}, 0\right]$

22. The centre of mass of three bodies each of mass 1 kg located at the point (0,0), (3,0) and (0,4) in the XY plane is

① $\left(\dfrac{4}{3}, 1\right)$ ② $\left(\dfrac{1}{3}, \dfrac{2}{3}\right)$ ③ $\left(\dfrac{1}{2}, \dfrac{1}{2}\right)$ ④ $\left(1, \dfrac{4}{3}\right)$

23. In a rocket, fuel burns at the rate of 1 kg/s. This fuel is ejected from the rocket with a velocity of 60 km/s. This exerts a force on the rocket equal to :

① 60 N ② 600 N ③ 6000 N ④ 60,000 N

24. A thin uniform rod of length L and mass M is hinged at one end and kept vertically. It is allowed to fall freely in the vertical plane. The angular speed of the rod when it reaches the horizontal position is :

① $\sqrt{\dfrac{3g}{L}}$ ② $\sqrt{\dfrac{2g}{L}}$ ③ $\sqrt{\dfrac{6g}{L}}$ ④ $\sqrt{\dfrac{g}{L}}$

25. A solid sphere rolls without slipping on a horizontal surface. It its kinetic energy is *K*, the fraction of *K* that is rotational is :

① $\dfrac{2}{5}$ ② $\dfrac{1}{5}$ ③ $\dfrac{3}{7}$ ④ $\dfrac{2}{7}$

26. A flywheel of moment of inertia *I* is subjected to a constant torque τ. If it starts from rest, the angular velocity after rotating through an angle θ is :

① $\sqrt{\dfrac{2\tau\theta}{I}}$ ② $\dfrac{\tau\theta}{I}$ ③ $\sqrt{\dfrac{\tau}{2I}\theta}$ ④ $\dfrac{2\tau}{I}\theta$

27. A ring of mass *M* and radius *R* is rolling without slipping with velocity *v*. The ratio of total kinetic energy to the linear kinetic energy is :

① 2 : 1   ② 1 : 1   ③ 3 : 2   ④ 5 : 2

28. The work done in rolling a uniform sphere of mass *M* and radius *R* through one complete revolution on a rough horizontal surface without slipping is :

① 2π*MgR*   ② Zero   ③ π*MgR*   ④ 4π*MgR*

29. A disc of mass *M* and radius *R* is rolling without slipping with speed *v*. Its total kinetic energy is :

① $\dfrac{1}{2}Mv^2$ ② $\dfrac{1}{4}Mv^2$ ③ $\dfrac{3}{4}Mv^2$ ④ $\dfrac{1}{2}Mv^2+\dfrac{1}{4}Mv^2$

30. A uniform sphere rolls without slipping down an inclined plane of height *h*. The velocity at the bottom is :

① $\sqrt{2gh}$ ② $\sqrt{\dfrac{10gh}{7}}$ ③ $\sqrt{\dfrac{5gh}{3}}$ ④ $\sqrt{\dfrac{4gh}{3}}$

31. The radius of gyration of a solid cylinder about its own axis is :

① $\dfrac{R}{2}$ ② $\dfrac{R}{\sqrt{2}}$ ③ $\dfrac{R}{\sqrt{3}}$ ④ *R*

32. The angular momentum of a particle of mass *m* moving in a circle of radius *r* with speed *v* is :

① *mvr*   ② $\dfrac{mv}{r}$ ③ $\dfrac{mr}{v}$ ④ $\dfrac{mv^2}{r}$

33. A thin disc of mass *M* and radius *R* rotates about an axis passing through its edge and perpendicular to its plane. Its moment of inertia is :

① $\dfrac{1}{4}MR^2$ ② $\dfrac{3}{4}MR^2$ ③ $\dfrac{1}{2}MR^2$ ④ $\dfrac{5}{4}MR^2$

34. A particle is moving along a circular path of radius *r* with constant speed *v*. The torque acting about the center is :

① Zero   ② $\dfrac{mv^2}{r}$ ③ *mvr*   ④ $\dfrac{mvr}{2}$

35. A body is rotating with angular velocity ω. Its angular momentum is doubled without change in kinetic energy. The new moment of inertia is :

① *I*   ② 2*I*   ③ 4*I*   ④ $\dfrac{I}{2}$

36. A solid sphere and a solid cylinder, both of same mass and radius, roll down the same inclined plane without slipping. Which one reaches the bottom first?

① Sphere   ② Cylinder

③ Both together   ④ Depends on inclination

37. If a constant torque is applied on a body, which of the following will be constant?

① Angular velocity   ② Angular momentum   ③ Angular acceleration   ④ Kinetic energy

38. Two particles of masses 2 kg and 4 kg are placed at $x = 0$ and $x = 3$ m on a straight line. The position of the centre of mass is :

① 1 m   ② 2 m   ③ 3 m   ④ 1.5 m

39. A uniform rod of length L and mass M is placed along the x-axis with one end at the origin. The x-coordinate of the centre of mass is :

① 0   ② $\dfrac{L}{2}$ ③ $\dfrac{L}{3}$ ④ $\dfrac{2L}{3}$

40. Two particles of masses m and $2m$ are projected with equal velocities at angles 30° and 60° to the horizontal respectively. The centre of mass follows a trajectory that is :

① A parabola at angle 30°   ② A parabola at angle 60°

③ A parabola at angle 45°   ④ A straight line

41. A uniform semicircular wire of radius R lies in a plane. The distance of its centre of mass from the centre of the circle is :

① $\dfrac{2R}{\pi}$ ② $\dfrac{R}{\pi}$ ③ $\dfrac{R}{2}$ ④ $\dfrac{R}{4}$

42. Three particles of equal mass m are placed at the vertices of an equilateral triangle of side a. The distance of the centre of mass from any vertex is :

① $\dfrac{a}{2}$ ② $\dfrac{a}{\sqrt{3}}$ ③ $\dfrac{a}{3}$ ④ $\dfrac{2a}{3}$

43. A body breaks into two equal parts. The two parts fly apart with equal velocities at right angles to each other. The cetre of mass of the two parts will move :

① In the direction of the first part

② In the direction of the second part

③ Along the bisector of the angle between their direction

④ Remains at rest

44. Two particles of equal mass are moving with velocities $+v$ and $-v$ along a straight line. The velocity of their centre of mass is :

① v ② $-v$ ③ Zero   ④ $\dfrac{v}{2}$

45. A projectile of mass m breaks into two equal fragments at the highest point of its trajectory. One fragment falls vertically down. The horizontal range of the other fragment relative to the initial point of projection will be :

① Equal to that of the intact projectile   ② Twice that of the intact projectile

③ Half that of the intact projectile   ④ Zero

CHEMISTRY

46. Bond polarity of diatomic molecule is because of:

① difference in electron affinities of two atoms   ② difference in electronegativities of two atoms

③ difference in ionisation potential   ④ all of the above

47. The compound containing co-ordinate bond is:

① SO_3　　　② O_3　　　③ H_2SO_4　　　④ All of these

48. Which compound is most covalent?

① LiCl　　　② LiF　　　③ LiBr　　　④ LiI

49. The correct sequence of increasing covalent character is represented by:

① LiCl < NaCl < $BeCl_2$　② $BeCl_2$ < NaCl < LiCl　③ NaCl < LiCl < $BeCl_2$　④ $BeCl_2$ < LiCl < NaCl

50. Shape of SF_2Cl_2 molecule is:

① tetrahedral　　　　　　　　② octahedral

③ square pyramidal　　　　　④ trigonal bipyramidal

51. The hybridisation scheme for the central atom includes a d-orbital contribution in:

① I_3^-　　　② PCl_3　　　③ NO_3^-　　　④ H_2Se

52. Which of the following will have the maximum dipole moment?

① CH_3F　　　② CH_3Cl　　　③ CH_3Br　　　④ CH_3I

53. Which of the following molecules/ions does not contain unpaired electrons?

① O_2^{2-}　　　② B_2　　　③ $N_2^{\ominus}$　　　④ O_2

54. Which of the following has minimum bond length?

① O_2　　　② O_2^+　　　③ O_2^-　　　④ O_2^{2-}

55. Which of the following represents the arrangement in increasing order of bond order & bond dissociation energy?

① $O_2^+ < O_2^{2-} < O_2^- < O_2$　　　② $O_2^{2-} < O_2^- < O_2 < O_2^+$

③ $O_2 < O_2^+ < O_2^{2-} < O_2^-$　　　④ $O_2^{2-} < O_2^- < O_2^+ < O_2$

Assertion–Reason Questions (Q.56–Q.60):

(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 not correct

(D) (A) is not correct but (R) is correct

56. Assertion: B_2 molecule is paramagnetic

Reason: The highest occupied molecule orbital is of σ-type.

① A　　　② B　　　③ C　　　④ D

57. Assertion: C–H bond in ethyne is shorter than C–H bonds in ethene.

Reason: Carbon atom in ethene is sp hybridised while it is sp^2 in ethyne.

① A　　　② B　　　③ C　　　④ D

58. Assertion: First ionisation energy for Nitrogen is lower than O_2 oxygen.

Reason: Across a period, effective nuclear charge increases.

① A　　　② B　　　③ C　　　④ D

59. Assertion: Zn(II) salts are diamagnetic.

Reason: Zn^{++} ion has one unpaired electron.

① A   ② B   ③ C   ④ D

60. Assertion: Ionisation enthalpy decreases on moving down the group.

Reason: Force of attraction between nucleus and electrons decreases on moving down the group.

① A   ② B   ③ C   ④ D

61. The size of ionic species is correctly given in the order:

① $Na^+ > Mg^{2+} > Cl^{7+} > Si^{4+}$ ② $Na^+ > Mg^{2+} > Sn^{4+} > Cl^{7+}$

③ $Cl^{7+} > Si^{4+} > Mg^{2+} > Na^+$ ④ $Cl^{7+} > Na^+ > Mg^{2+} > Si^{4+}$

62. What is the value of electron gain enthalpy of Na^+ if IE_1 of Na = 5.1eV?

① +2.55 eV   ② +10.2   ③ –5.1 eV   ④ –10.2 eV

63. The angular momentum of electron of H-atom is proportional to:

① r^2 ② $\dfrac{1}{r}$ ③ $\sqrt{r}$ ④ $\dfrac{1}{\sqrt{r}}$

64. If the shortest wavelength of H-atom in lyman series is x, then longest wavelength in Balmer series of H_e^+ is:

① $\dfrac{9x}{5}$ ② $\dfrac{36x}{5}$ ③ $\dfrac{x}{4}$ ④ $\dfrac{5x}{9}$
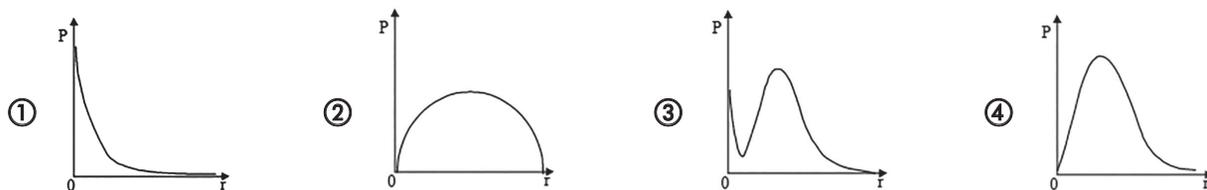
65. The angular momentum of an electron in 2P orbital is:

① $\dfrac{h}{2\pi}$ ② $\dfrac{h}{\sqrt{2}\pi}$ ③ $\dfrac{2h}{\pi}$ ④ None of these

66. The radius of the second Bohr orbit for hydrogen atom is:

① 1.65 Å   ② 4.76 Å   ③ 0.529 Å   ④ 2.12 Å

67. 'P' is the probability of finding the is electron of hydrogen atom in a spherical shell of infinitesimal thickness, dr, at a distance r from the nucleus. The volume of this shell is $4\pi r^2 dr$. The qualitative sketch of the dependence of 'P' on 'r' is:

68. A gas absorbs a photon of 335 nm and emits at two wavelength. If one of the emission is at 680 nm, the other is at:

① 1035 nm   ② 325 nm   ③ 743 nm   ④ 518 nm

69. According to Bohr's theory, the angular momentum of an electron in 5th Orbit is:

① $25\dfrac{h}{\pi}$ ② $\dfrac{h}{\pi}$ ③ $10\dfrac{h}{\pi}$ ④ $2.5\dfrac{h}{\pi}$

70. The number of radial nodes of 3S and 2p orbitals are respectively:

① 2, 0   ② 0, 2   ③ 1, 2   ④ 2, 1

71. The $Z_{effective}$ for He is:

① 2   ② 1.7   ③ 1.85   ④ 1.65

72. The diagonal similarities are due to similar polarising power for the elements. The polarising power is directly proportional to:

① $\dfrac{\text{ionic charge}}{\text{ionic radius}}$ ② $\dfrac{(\text{ionic charge})^2}{\text{ionic radius}}$ ③ $\dfrac{\text{ionic charge}}{(\text{ionic radius})^2}$ ④ $\dfrac{\text{ionic charge}}{(\text{ionic radius})^{\frac{1}{2}}}$

73. The increasing order of atomic radii of the following group 13 elements is:

① Al < Ga < In < Tl   ② Ga < Al < In < Tl   ③ Al < In < Ga < Tl   ④ Al < Ga < Tl < In

74. Electronegativity of an element is 1.0 on the Puling scale. Its value on Mulliken scale will be:

① 2.8   ② 1   ③ 2.0   ④ 1.5

75. The ionization potential of lithium is 520 KJ/mole. The energy required to convert 70 mg of lithium atom in gaseous state into Li^+ ions is:

① 5.2 KJ   ② 52 KJ   ③ 520 KJ   ④ 52 J

76. Density of 2.05 M solution of acetic acid in water is 1.02 g/mL. Find molality of same solution.

① 1.14   ② 3.28   ③ 2.28   ④ 0.44

77. Haemoglobin contains 0.33% of iron by weight. Molecular weight of Haemoglobin is approximately 67200. How many iron atoms are present in one molecule of Haemoglobin?

① 6   ② 2   ③ 4   ④ 1

78. Find the volume of CO_2 at N.T.P. obtained on heating 10 g of 90% pure limestone:

① 22.4 L   ② 20.16 L   ③ 2.24 L   ④ 2.016 L

79. How many g of NaOH will be needed to prepare 500 ml of 0.4 M solution?

① 1 g   ② 8 g   ③ 4 g   ④ 16 g

80. A piece of Mg is dissolved in 40 ml of $\dfrac{N}{10}$ HCl completely. The excess of acid is neutralized by 15 ml of $\dfrac{N}{5}$ NaOH. The weight of Mg is:

① 0.24 g   ② 0.024 g   ③ 0.012 g   ④ 0.40 g

81. Volume at N.T.P. of oxygen required to completely burn 1kg coal (100% carbon)

① 22,400 L   ② 22.4×10^3 L   ③ 1.86×10^3 L   ④ 1000 L

82. The molefraction of glucose in aqueous solution is 0.2, then molality of solution will be:

① 13.8   ② 55.56   ③ 2   ④ 12

83. Dissolving 120 g of urea (M. W = 60) in 1000 g water gave solution of density 1.15 g/mL. The molarity of the solution is:

① 1.78 M   ② 1.05 M   ③ 2.05 M   ④ 2.22 M

84. The weight of KOH in 50 milliequivalent is:

① 1.6 g ② 2.2 g ③ 2.8 g ④ 4.8 g

85. The normally of solution obtained by mixing 100 ml of 0.2 M H_2SO_4 with 100 ml of 0.2 M NaOH is:

① 0.1 ② 0.2 ③ 0.5 ④ 0.3

86. Calculate the weight of water produced when 4g H_2 reacts with 20 g oxygen:

① 36 g ② 2.25 g ③ 22.5 g ④ 45 g

87. The compound with two lone pairs of electrons on the central atom is:

① BrF_5 ② ClF_3 ③ XeF_0 ④ SF_4

88. The molecule/ion with square pyramidal shape is:

① $[Ni(CN)_4]^{2-}$ ② PF_5 ③ PCl_5 ④ BrF_5

89. The species in which nitrogen atom is in a state of sp hybridisation is:

① $NO_3^{\ominus}$ ② NO2 ③ $\overset{+}{N}O_2$ ④ $\overset{-}{N}O_2$

90. The hybridisation of 'N' in NH_4NO_3 are respectively:

① sp^3, sp^3 ② sp^2, sp^2 ③ sp^3, sp^2 ④ sp^2, sp^3

Biology

91. Pneumatophores occur in

① Halophytes ② Free-floating hydrophytes

③ Carnivorous plants ④ Submerged hydrophytes

92. Sweet potato is a modified

① Stem ② Adventitious root ③ Tap root ④ Rhizome

93. Root hairs develop from the region of :

① Maturation ② Elongation

③ Root cap ④ Meristematic activity

94. Coconut fruit is a

① Drupe ② Berry ③ Nut ④ Capsula

95. In *Bougainvillea*, thorns are the modifications of :

① Stipules ② Adventitious root ③ Stem ④ Leaf

96. The morphological nature of the edible part of coconut is

① Perisperm ② Cotyledon ③ Endosperm ④ Pericarp

97. Opposite phyllotaxy is not seen in

① Mango   ② guava   ③ Calotropis   ④ Mint

98. An inflorescence with younger flowers at the base and the older ones at its apex, is called :

① Hypanthodium   ② Head   ③ Racemose   ④ Cymose

99. In roots, absorption of water and minerals mostly occurs in the –

① Root cap   ② Region of elongation

③ Region of maturation   ④ Meristematic region

100. Free-central placentation occurs in –

① *Brassica*   ② *Citrus*   ③ *Dianthus*   ④ *Argemone*

101. The term 'polyadelphous' is related to –

① Corolla   ② Calyx   ③ Androecium   ④ Gynoecium

102. Stems modified into flat green organs and performing the function of leaves, are called

① Cladodes   ② Phyllodes   ③ Phylloclades   ④ Scales

103. Which of the following is not a stem modification ?

① Pitcher of *Nepenthes*   ② Thorns of *Citrus*

③ Tendrils of cucumber   ④ Flattened structures of *Opuntia*

104. Tricarpellary syncarpous gynoecium is found in flowers of –

① Liliaceae   ② Solanaceae   ③ Fabaceae   ④ Poaceae

105. The standard petal of a papilonaceous corolla is

① Carina   ② Pappus   ③ Vexillum   ④ Corona

106. Leaves become modified to spines in

① Onion   ② Silk cotton   ③ *Opuntia*   ④ Pea

107. Keel is the characteristic feature of the flower of –

① Aloe   ② Tomato   ③ Tulip   ④ *Indigofera*

108. Perigynous flowers are found in

① China rose   ② Rose   ③ Guava   ④ Cucumber

109. Ovary is inferior in

① Guava   ② Rose   ③ China rose   ④ Peach

110. Flowers are unisexual in

① Cucumber   ② China rose   ③ Onion   ④ Pea

111. Roots play insignificant role in absorption of water in :

① *Pistia*   ② Pea   ③ Wheat   ④ Sunflower

112. Axile placentation is present in

① Lemon   ② Pea   ③ *Argemone*   ④ *Dianthus*

113. Among china rose mustard, brinjal, potato, onion and tulip, how many plants have superior ovary ?

① 6   ② 3   ③ 4   ④ 5

114. An aggregate fruit is one which develops from :

① Multicarpellary superior ovary   ② Multicarpellary syncarpous gynoecium

③ Multicarpellary apocarpous gynoecium   ④ Complete inflorescence

115. Which one of the following statements is correct ?

① A sterile pistil is called a staminode

② The seed in grasses is not endospermic

③ Mango is a parthenocarpic fruit

④ A proteinaceous aleurone layer is present in maize grain.

116. When the margins of sepals or petals overlap with one another without any particular direction, the condition is called –

① Valvate   ② Vexillary   ③ Imbricate   ④ Twisted

117. An example of edible underground stem is

① Potato   ② Carrot   ③ Groundnut   ④ Sweet potato

118. Placenta and pericarp are both edible in –

① Gram   ② Maize   ③ Coconut   ④ Groundnut

119. Seed coat is not thin or membranous in –

① Gram   ② Maize   ③ Coconut   ④ Groundnut

120. Placentation in tomato and lemon is –

① Axile   ② Parietal   ③ Free central   ④ Marrginal

121. Whorled simple leaf with reticulate venation are present in –

① *Datura*   ② Mustard   ③ Gulmohar   ④ Tomato

122. Flowers are zygomorphic in

① *Datura*   ② Mustard   ③ Gulmohar   ④ Tomato

123. The ovary is half inferior in flowers of

① Guava   ② Peach   ③ Cucumber   ④ Cotton

124. A drupe develops in

① Tomato   ② Mango   ③ Wheat   ④ Pea

125. Which one of the following statements is correct ?

① Flower of tulip is a modified shoot   ② In tomato, fruit is a capsule

③ Seeds of orchids have oil rich endosperms   ④ Placentation in primrose is basal

126. Secondary xylem and phloem in dicot stem are produced by

① Apical meristem   ② Vascular cambium   ③ Phellogen   ④ Axillary meristems

127. Casparian strips occur in

① Epidermis   ② Pericycle   ③ Cortex   ④ Endodermis

128. Plants having little or no secondary growth are

① grasses   ② Deciduous angiosperms

③ Conifers   ④ Cycads

129. Vascular cambium normally gives rise to :

① Phelloderm   ② Primary phloem   ③ Secondary xylem   ④ Periderm

130. Identify the wrong statement in context of heartwood.

① Organic compounds are deposited in it

② It is highly durable

③ It conducts water and minerals efficiently

④ It comprises of dead elements with highly lignified walls.

131. The balloon shaped structures, called tyloses :

① Are extensions of xylem parenchyma cells into vessels

② Are linked to ascent of sap through xylem vessels

③ Originate in the lumen of vessels

④ Characterise the sapwood.

132. Cortex is the region found between :

① Endodermis and pith   ② Endodermis and vascular bundle

③ Endodermis and stele   ④ Pericycle and endodermis

133. Specialised epidermal cells surrounding the guard cells are called :

① Complementary cells   ② Subsidiary cells   ③ Bulliform cells   ④ Lenticels

134. Vascular bundles in monocots are considered closed since

① There are no vessels with perforations   ② Xylem is surrounded all around by phloem

③ A bundle sheath surrounds each bundle   ④ Cambium is absent

135. A major feature of the monocot root is the presence of :

   ① Vascular bundles without cambium

   ② Cambium sandwiched between phloem and xylem along the radius.

   ③ Open vascular bundles

   ④ Scattered vascular bundles.

136. Read the different components (a) to (d) in the list given below and tell the correct order of the components with reference to their arrangement from outer side to inner side of a woody dicot stem.

   (a) Secondary cortex   (b) Wood   (c) Secondary phloem   (d) Phloem

The correct order is :

   ① (a), (b), (d), (c)   ② (d), (a), (c), (b)

   ③ (d), (c), (a), (b)   ④ (c), (d), (b), (a)

137. Which of the following structures would you consider to differentiate between an old piece of dicot stem and a dicot root?

   ① Cortical cells   ② Secondary xylem   ③ Secondary phloem   ④ Protoxylem

138. Tracheids differ from other tracheary elements in :

   ① Being lignified   ② Having casparian strips   ③ Being imperforate   ④ Lacking nucleus

139. Lenticels are involved in –

   ① Photosynthesis   ② Water transport   ③ Gaseous exchange   ④ Food transport

140. Interfascicular cambium develop from the cells of :

   ① Pericycle   ② Medullary rays   ③ Xylem parenchyma   ④ Endodermis

141. Age of a tree can be estimated by :

   ① Diameter of its heartwood   ② Its height and girth

   ③ Biomass   ④ Number of annual rings.

142. The common bottle cork is a product of :

   ① Vascular cambium   ② Dermatogen   ③ Phellogen   ④ Xylem

143. Gymnosperms are also called soft wood spermatophytes because they lack :

   ① Xylem fibres   ② Cambium

   ③ Phloem fibres   ④ Thick-walled tracheids.

144. Closed vascular bundles lack :

   ① Pith   ② Ground tissue   ③ Conjunctive tissue   ④ Cambium

145. Water containing cavities in vascular bundles are found in :

   ① Pinus   ② Sunflower   ③ Maize   ④ Cycas

146. Ground tissue includes :

  ① All tissues internal to endodermis   ② All tissues external to endodermis

  ③ All tissues, except epidermis and vascular bundles   ④ Epidermis and cortex.

147. The chief water conducting elements of xylem in gymnosperms are :

  ① Fibres   ② Transfusion tissue   ③ Tracheids   ④ Vessels

148. Heartwood differs from sapwood in :

  ① Absence of vessels and parenchyma   ② Having dead and non conducting elements

  ③ Being suscepible to pests and pathogens   ④ Presence of rays and fibres

149. Palisade parenchyma is absent in the leaves of :

  ① Gram   ② Soyabean   ③ *Sorghum*   ④ Mustard

150. Annular or spirally thickened conducting elements generally develop in protoxylem when root or stem is

  ① Widening   ② Differentiating   ③ Maturing   ④ Elongating

151. Vascular tissues of flowering plants develop from

  ① Dermatogen   ② Periblem   ③ Plerome   ④ Phellogen

152. Secondary growth is best observed in :

  ① Teak and pine   ② Deodar and fern

  ③ Wheat and maiden hair fern   ④ Sugarcane and sunflower

153. Four radial vascular bundles are found in :

  ① Dicot root   ② Monocot root   ③ Dicot stem   ④ Monocot stem

154. Axillary bud and terminal bud are derived from the activity of :

  ① Lateral meristem   ② Intercalary meristem   ③ Apical meristem   ④ Parenchyma

155. At maturity, which of the following is non-nucleated ?

  ① Palisade cell   ② Cortical cell   ③ Sieve cell   ④ Companion cell

156. As a tree grows older, which of the following increases more rapidly in thickness ?

  ① Heartwood   ② Sapwood   ③ Phloem   ④ Cortex

157. Which of the following plant cells will show totipotency ?

  ① Sieve tubes   ② Xylem vessels   ③ Meristem   ④ Cork cells.

158. Which exposed wood will decay faster?

  ① Sapwood   ② Wood with lot of fibres   ③ Softwood   ④ Heartwood

159. A bicollateral vascular bundle is characterised by :

① Phloem being sandwiched between xylem
② Transverse splitting of vascular bundle
③ Longitudinal splitting of vascular bundle
④ Xylem being sandwiched between phloem.

160. Vascular cambium produces

① Primary xylem and primary phloem
② Secondary xylem and secondary phloem
③ Primary xylem and secondary phloem
④ Secondary xylem and primary phloem

161. What is true about monocot leaf ?

① Reticulate venation

② Absence of bullifom cells in epidermis

③ Mesophyll not differentiated into palisade and spongy tissues

④ Well differentiated mesophyll

162. For union between stock and scion in grafting, which one is the first to occur ?

① Formation of callus
② Production of plasmodesmata
③ Differentiation of new vascular tissues
④ Regeneration of cortex and epidermis

163. Pericycle of roots give :

① Mechanical support ② Lateral roots ③ Vascular bundles ④ Adventitious buds.

164. Monocot leaves possess :

① Intercalary meristem ② Lateral meristem ③ Apical meristem ④ Mass meristem

165. Periderm is produced by :

① Vascular cambium ② Fascicular cambium ③ Phellogen ④ Intrafascicular cambium

166. Which of the following features is used to identify a male cockroach from a female cockroach?

① Presence of a boat shaped sternum on the 9th abdominal segment.

② Presence of caudal styles.

③ Forewings with darker wings in males

④ Presence of anal receptors

167. Select the correct route for passage of sperms in male frogs ?

① Testes ⟶ Bidder's canal ⟶ Kidney ⟶ Vasa efferentia ⟶ Urinogenital duct ⟶ Cloaca

② Testes ⟶ Vasa efferentia ⟶ Kidney ⟶ Seminal vesicle ⟶ Urinogenital duct ⟶ Cloaca

③ Testes ⟶ Vasa efferentia ⟶ Bidder's canal ⟶ Ureter ⟶ Cloaca

④ Testes ⟶ Vasa efferentia ⟶ Kidney ⟶ Bidder's canal ⟶ Urinogenital duct ⟶ Cloaca

168. Which of the following structures does not open into the genital chamber of female cockroaches ?

- ① A pair of collateral glands
- ② A single median oviduct
- ③ Spermatheca
- ④ A pair of anal cerci.

169. In male cockroaches, sperms are stored in which part of the reproductive system ?

- ① Testes
- ② Vas deferens
- ③ Seminal vesicles
- ④ Mushroom glands

170. Which of the following feature is not present in *Periplanata americana ?*

- ① Schizocodom as body cavity
- ② Indeterminate and radial leavage during embryonic development
- ③ Exoskeleton composed of N-acetyl glucosamine
- ④ Metamerically segmented body.

171. The terga, sterna and pleura of the cockroache's body are joined by :

- ① Athrodial membrane
- ② Cartilage
- ③ Cementing glue
- ④ Muscular tissue

172. The body cells of cockroach discharge their nitrogenous wastes in the haemolymph, mainly in the form of

- ① Potassium urate
- ② Urea
- ③ Calcium carbonate
- ④ Ammonia

173. Select the correct option with respect to cockroaches.

- ① Malphigian tubules convert nitrogenous wastes into urea
- ② Wings extend beyond the tip of abdomen in male cockroaches.
- ③ Nervous system comprises of a dorsal nerve chord and ten pairs of ganglia
- ④ The forewings are tegmina which are used in flight.

174. What external changes are visible after the last moult of a cockroach nymph ?

- ① Labium develops
- ② Mandibles become harder
- ③ Anal cerci develop
- ④ Both pairs of wings develop

175. Which one of the following characteristics is common both in humans and adult frogs ?

- ① Four chambered heart
- ② Internal fertilisation
- ③ Nucleated RBC's
- ④ Ureotelic mode of excretion

176. Select the correct statement from the ones given below with respect to *Periplaneta americana*.

- ① Grinding of food is carried out only by mouth parts
- ② Nervous system located dorsally, consists of segmentally arranged ganglia, joined by a pair of longitudinal connectives.
- ③ Anal cerci are present in both males and females
- ④ Nymphs and adults have wings.

177. Compared to those in humans, the erythrocytes of frogs are :

① Nucleated, without haemoglobin

② Without nucleus, with haemoglobin

③ Nucleated with haemoglobin.

④ Very much smaller and fewer.

178. Consider the following statements with respect to *Rana tigrina*. Select the correct option stating which ones are true (T) and which ones are false (F).

(a) On dry land, it would die due to lack of O_2, if its mouth is forcibly kept closed for a few days.
(b) It has four chambered heart.
(c) On dry land, it turns ureotelic from ureotelic.
(d) Its life cycle is carried out in pond water.

	a	b	d	d		a	b	d	d		a	B	C	D		a	B	C	D
①	F	F	T	T	②	F	T	T	F	③	T	F	F	T	④	T	T	F	F

179. In frogs, fenestra ovalis is :

① The communication between pharynx and tympanic cavity

② The external opening of the tympanic cavity covered by tympanic membrane.

③ The air filled cavity of middle ear

④ The opening in the auditory capsule which separates the middle ear from the internal ear.

180. Mucus helps frog in forming :

① Thick skin
② Dry skin
③ Smooth skin
④ Moist skin