Test Series (2023)

Mock Test-07

NEET

DURATION : 200 Minutes | **16-04-2023** | **M. MARKS : 720**

Topics Covered

Physics :	Complete Syllabus (Class 11th and 12th)
Chemistry :	Complete Syllabus (Class 11th and 12th)
Biology :	**(Botany) :** Complete Syllabus (Class 11th and 12th)
	(Zoology) : Complete Syllabus (Class 11th and 12th)

General Instructions:

1. Immediately fill in the particulars on this page of the test booklet.
2. The test is of **3 hour 20 minute** duration.
3. The test booklet consists of **200** questions. The maximum marks are **720**.
4. There are four Section in the Question Paper, Section I, II, III & IV consisting of Section-I **(Physics)**, Section-II **(Chemistry)**, Section-III **(Botany)** & Section IV **(Zoology)** and having **50 Questions** in each part.
5. There is only one correct response for each questions.
6. Each correct answer will give 4 marks while 1 Mark will be deducted for a wrong MCQ response.
7. No student is allowed to carry any textual material, printed or written, bits of papers, pager, mobile phone, any electronic device, etc. inside the examination room/hall.
8. On completion of the test, the candidate must hand over the Answer Sheet to the Invigilator on duty in the Room/Hall. However, the candidates are allowed to take away this Test Booklet with them.

OMR Instructions:

1. Use blue/black dark ballpoint pens.
2. Darken the bubbles completely. Don't put a tick mark or a cross mark where it is specified that you fill the bubbles completely. Half-filled or over-filled bubbles will not be read by the software.
3. Never use pencils to mark your answers.
4. Never use whiteners to rectify filling errors as they may disrupt the scanning and evaluation process.
5. Writing on the OMR Sheet is permitted on the specified area only and even small marks other than the specified area may create problems during the evaluation.
6. Multiple markings will be treated as invalid responses.
7. **Do not fold or make any stray mark on the Answer Sheet (OMR).**

SECTION-I (PHYSICS)

SECTION - A

1. A series *L*-*C*-*R* circuit is connected to an AC voltage source. When *L* is removed from the circuit, the phase difference between current and voltage is $\frac{\pi}{4}$. If instead *C* is removed from the circuit, the phase difference is again $\frac{\pi}{4}$ between current and voltage. The power factor of the circuit is

(1) 0.2 (2) 1.0

(3) 1.2 (4) zero

2. A wire of length *L*, area of cross-section *A* is hanging from a fixed support. The length of the wire becomes $(L + L_1)$ when a mass *M* is suspended from its free end. The expression for Young's modulus is

(1) $\frac{Mg(L+L_1)}{AL}$ (2) $\frac{MgL}{(L+L_1)A}$

(3) $\frac{MgL}{A(L-L_1)}$ (4) $\frac{MgL}{AL_1}$

3. A long solenoid of length 40cm having 240 turns carries a current of 5A. The magnetic field at the centre of the solenoid is

(1) 3.14×10^{-2} T

(2) 6.28×10^{-4} T

(3) 3.77×10^{-3} T

(4) 4.1×10^{-4} T

4. A ray is incident at an angle *i* on surface of a small angled prism (with angle of prism $A = 5°$) and emerges normally from the opposite face. If the refractive index of the material of prism is 1.4, then angle of incident is nearly

(1) 4° (2) 6°

(3) 7° (4) 3°

5. In a certain region of space with volume 0.2 m^3, the electric potential is found to be 15V throughout. What is the electric field in this region?

(1) 30 N/C (2) 7.5 N/C

(3) 75 N/C (4) Zero

6. For which of the following cases Bohr model is not valid?

(1) Deuteron atom

(2) Hydrogen atom

(3) Singly ionised helium atom (He^+)

(4) Singly ionised lithium atom (Li^+)

7. Light with average flux of 50 W/cm^2 falls normally on non-reflecting surface at normal incident having surface area 10 cm^2. The energy received by the surface during the span of one minute is

(1) 10^4 J (2) 3×10^4 J

(3) 6×10^3 J (4) 5×10^3 J

8. An electron is accelerated from rest through a potential of V volt. If de Broglie wavelength of electron is 1.65 Å then potential is nearly

(1) 55 V (2) 32 V

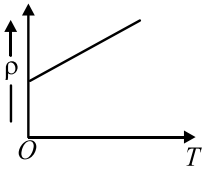
(3) 105 V (4) 200 V

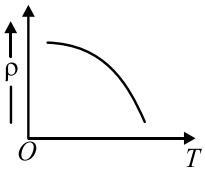
9. A body weighs 63 N on the surface of earth. What is the gravitational force on it at a height equal to half of radius of the earth?

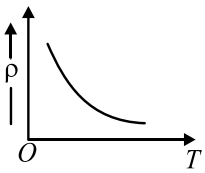
(1) 32 N (2) 45 N

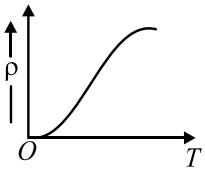
(3) 105 N (4) 28 N

10. Which of the following graph represents variation of resistivity (ρ) with temperature (*T*) for semiconductor materials?

(1) 

(2) 

(3) 

(4) 

11. Light of frequency 1.7 times the threshold frequency is incident on the surface of photosensitive material. What will be photoelectric current if the frequency is halved and intensity is doubled?

(1) Four times

(2) Same

(3) One-fourth

(4) Zero

12. A 80 μF capacitor is connected to 100V, 50 Hz ac supply. The RMS value of current in the circuit is nearly

(1) 1.2 A (2) 1.5 A
(3) 2.1 A (4) 2.5 A

13. Assume that light of wavelength 550 nm is coming from a star. The limit of resolution of a telescope, whose objective lens has diameter of 1.22 m, is

(1) 2.5×10^{-6} rad (2) 5.5×10^{-7} rad
(3) 1.6×10^{-7} rad (4) 3.6×10^{-7} rad

14. A ball is thrown vertically downwards with speed of 10 m/s from the top a tower. It hits the ground after sometime with velocity of 50 m/s. The height of the tower is ($g = 10$ m/s^2)

(1) 340 m (2) 210 m
(3) 120 m (4) 49.5 m

15. A cylinder contains oxygen gas at pressure of 166 kPa and temperature of 200 K. Its density is (R = 8.3 J mol^{-1}K^{-1})

(1) 3.2 kg m^{-3} (2) 1.6 kg m^{-3}
(3) 0.5 kg m^{-3} (4) 0.02 kg m^{-3}

16. When uranium isotope $^{235}_{92}U$ is bombarded with a neutron, it generates $^{144}_{56}Ba$ and three neutrons and

(1) $^{91}_{40}ZN$ (2) $^{103}_{36}Kr$
(3) $^{89}_{36}Kr$ (4) $^{56}_{26}Fe$

17. The decrease in width of depletion layer in *p-n* junction diode is due to

(1) Reverse bias only
(2) Increase in forward bias only
(3) Both forward bias and reverse bias
(4) None of these

18. The phase difference between displacement and velocity of a particle in simple harmonic motion is

(1) π (2) Zero
(3) $\frac{3\pi}{2}$ (4) $\frac{\pi}{2}$

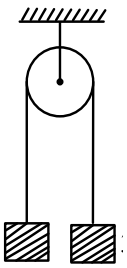
19. A cobalt rod of susceptibility 1999 is subjected to a magnetised field of 1500 Am^{-1}. The permeability of cobalt material is

(1) $8\pi \times 10^{-4}$ TmA^{-1}
(2) $6\pi \times 10^{-4}$ TmA^{-1}
(3) $2\pi \times 10^{-3}$ TmA^{-1}
(4) $7\pi \times 10^{-3}$ TmA^{-1}

20. The quantities of heat required to raise the temperature of two solid copper spheres of radii r and $2r$ through 1K are in the ratio

(1) $\frac{9}{4}$ (2) $\frac{1}{8}$
(3) $\frac{1}{4}$ (4) $\frac{27}{8}$

21. Two bodies of masses 2 kg and 3 kg are tied to the ends of massless string. The string passes over the pulley which is frictionless. The acceleration of the mass 2 kg in terms of acceleration due to gravity (g) is



(1) $\frac{g}{2}$ (2) $\frac{g}{3}$
(3) $\frac{g}{10}$ (4) $\frac{g}{5}$

22. The mean free path for an ideal gas, with molecular diameter d and number density n is expressed as

(1) $\frac{1}{\pi n^2 d}$
(2) $\frac{1}{\sqrt{2}\pi n d^2}$
(3) $\frac{1}{2\sqrt{2}\pi n^2 d^2}$
(4) $\frac{1}{\sqrt{2}\pi n d}$

23. A short electric dipole has a dipole moment of 16×10^{-9} C m. The electric potential due to this dipole at a point 0.6m from centre of dipole situated on dipole axis may be

(1) 400 V (2) 200 V
(3) –200 V (4) 0

24. Dimensions of coefficient of viscosity are

(1) [ML^{2}T^{-1}] (2) [MLT^{-1}]
(3) [ML^{-1}T^{-1}] (4) [ML^{2}T^{-3}]

25. The ionisation potential of hydrogen atom is 13.6 Volt. The energy required to remove an electron from the second orbit of hydrogen is:

(1) 3.4 eV (2) 6.8 eV
(3) 13.6 eV (4) 27.2 eV

26. In a guitar, string *A* and *B* are made of same material and are slightly out of tune and produce beats of frequency 5. When tension in *B* is slightly increased, the beat frequency increases to 8 Hz. If frequency of *A* is 516 Hz, the original frequency of *B* is

(1) 521 Hz (2) 507 Hz
(3) 526 Hz (4) 509 Hz

27. The colour code of a resistance is given below

The value of resistance (in ohm) with tolerance is

(1) $27 \times 10^4 \pm 10\%$
(2) $63 \times 10^4 \pm 5\%$
(3) $32 \times 10^5 \pm 20\%$
(4) $27 \times 10^4 \pm 5\%$

28. The Brewster's angle i_b for an interface should be

(1) $i_b = 90°$
(2) $0 \le i_b < 30°$
(3) $0° \le i_b < 40°$
(4) $45° \le i_b < 90°$

29. The capacitance of parallel plate capacitor with air as a medium is 12 μF. With the introduction of dielectric medium the capacitance becomes 144 μF. The permittivity of medium is ($\varepsilon_0 = 8.85 \times 10^{-12} C^2N^{-1}m^{-2}$)

(1) $1.06 \times 10^{-10} C^2N^{-1}m^{-2}$
(2) $5.31 \times 10^{-11} C^2N^{-1}m^{-2}$
(3) $2.1 \times 10^{-9} C^2N^{-1}m^{-2}$
(4) $6.2 \times 10^{-11} C^2N^{-1}m^{-2}$

30. Find the torque about the origin when a force of $4\hat{k}$ N acts on a particle whose position vector is $3\hat{j}$ m.

(1) $12\hat{j}$ Nm (2) $6\hat{i}$ Nm
(3) $12\hat{i}$ Nm (4) $-12\hat{k}$ Nm

31. A resistance wire connected to left gap of a meter bridge balances 15Ω resistance in the right gap at a point which divides the bridge wire in the ratio 2 : 3. If the length of resistance wire is 1.50m, then length of 1Ω of the resistance wire is

(1) 0.15 m
(2) 0.2 m
(3) 0.25 m
(4) 0.3 m

32. For a transistor action, which of the statement is correct?

(1) Base, emitter and collector regions should have same doping concentration
(2) Both emitter and collector region are forward biased
(3) Both emitter and collector region are reverse biased
(4) Base region must be very thin and lightly doped

33. The ratio of contribution made by electric field and magnetic field components to the intensity of electromagnetic wave is (*c* is speed of electromagnetic wave)

(1) 2 : 1 (2) 1 : 1
(3) $c^2 : 1$ (4) 1 : c

34. A charged particle has drift velocity of 7.5×10^{-4} ms^{-1} and has mobility of 3×10^6 $m^2V^{-1}s^{-1}$ under the effect of electric field *E*. The value of *E* is

(1) 2.25×10^{-10} V/m
(2) 3×10^{-9} V/m
(3) 2.5×10^{-10} V/m
(4) 2.2×10^{-8} V/m

35. A spherical conductor of diameter 20 cm has a charge of 6.4×10^{-9} C distributed uniformly. What is the magnitude of electric field at a point 30 cm from the centre of the sphere?

(1) 3.2×10^3 N/C
(2) 6.4×10^3 N/C
(3) 6.4×10^2 N/C
(4) 3.2×10^4 N/C

SECTION - B

36. Taking into account of significant figure, what is value of 9.99 m – 0.009 m?

(1) 9.98 m
(2) 9.981 m
(3) 9.99 m
(4) 10 m

37. In Young's double slit experiment if the separation between coherent sources is doubled and distance of screen from slit plane is halved, then fringe width becomes

(1) Half
(2) Four times
(3) One-fourth
(4) Double

38. Two cylinders of equal capacity are connected to each other via stop cock. *A* contains an ideal gas at a standard temperature and pressure, *B* is completely evacuated. The entire system is thermally insulated. The stop cock suddenly opens. Which one is correct option?

(1) Pressure of the gas becomes double
(2) The gas equation can be applied to intermediate state
(3) The temperature of the gas becomes half
(4) Change in internal energy is zero

39. The power obtained in a reactor using U^{235} disintegration is 1000 kW. The mass decay of U^{235} per/hour is:

(1) 10 microgram
(2) 20 microgram
(3) 40 microgram
(4) 1 microgram

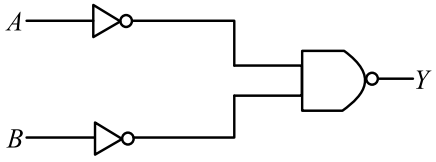
40. A capillary tube of radius *r* is immersed in water and water rises to height *h* in tube. The mass of water rise in capillary tube is 6g. Another capillary tube of radius 2*r* is immersed in water. The mass of water that will rise in the tube is

(1) 9 g (2) 10.0 g
(3) 12 g (4) 3 g

41. The screw gauge has least count equal to 0.02 mm and there are 50 divisions in its circular scales. The pitch of the screw gauge is

(1) 0.25 mm
(2) 1 mm
(3) 0.5 mm
(4) 0.05 mm

42. For the logic gate, truth table is



(1)

A	*B*	*Y*
0	0	0
0	1	1
1	0	1
1	1	1

(2)

A	*B*	*Y*
0	0	1
1	0	1
1	1	0
0	1	1

(3)

A	*B*	*Y*
0	0	0
0	1	0
1	0	0
1	1	1

(4)

A	*B*	*Y*
0	0	1
1	0	1
0	1	0
1	1	0

43. The average thermal energy for diatomic rigid molecule is (k_B is Boltzmann's constant and *T* is absolute temperature)

(1) $\frac{3}{2}k_BT$ (2) $\frac{5}{2}k_BT$
(3) k_BT (4) $\frac{7}{2}k_BT$

44. The solid material which has negative temperature coefficient of resistance are

(1) Insulator only
(2) Metals
(3) Semiconductors only
(4) Insulators and semiconductors

45. Two particles of masses 2g and 36g respectively are attached to two ends of a rigid light rod of length 1.9 m. The centre of the mass of the system from 2g particle is nearly at distance of

(1) 1.4 m (2) 1.8 m
(3) 1.7 m (4) 0.95 m

46. **Assertion:** The average translational kinetic energy of the molecules in one mole of all ideal gases, at the same temperature is the same.
Reason: The average kinetic energy of one mole of any ideal gas at temperature T is given by $< E >= \frac{9}{2}RT$

(1) If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.
(2) If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.
(3) If Assertion is True but the Reason is False.
(4) If both Assertion & Reason are False.

47. **Assertion:** If the angles of base of a prism are equal, then in the position of minimum deviation the refracted ray will pass parallel to the base of prism.
Reason: In the case of minimum deviation, the angle of incidence is equal to the angle of emergence.

(1) If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.
(2) If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.
(3) If Assertion is True but the Reason is False.
(4) If both Assertion & Reason are False.

48. **Assertion:** In a wave, particle velocity varies w.r.t time, while the wave velocity is independent of time.
Reason: For propagation of mechanical wave, the medium must have properties of elasticity and inertia.
(1) If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.
(2) If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.
(3) If Assertion is True but the Reason is False.
(4) If both Assertion & Reason are False.

49. **Assertion:** We cannot get diffraction pattern from a wide slit illuminated by monochromatic light.
Reason: In diffraction pattern all the bright bands are not of same intensity.
(1) If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.
(2) If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.
(3) If Assertion is True but the Reason is False.
(4) If both Assertion & Reason are False.

50. **Assertion:** Moment of inertia of a body is minimum when axis of rotation passes through centre of mass.
Reason: The distribution of mass is nearest to axis passing through centre of mass.
(1) If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.
(2) If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.
(3) If Assertion is True but the Reason is False.
(4) If both Assertion & Reason are False.

SECTION-II (CHEMISTRY)

SECTION - A

51. Identify the correct order of electron affinity among these:
(I) $[He]2s^2\,2p^5$
(II) $[He]2s^2\,2p^3$
(III) $[He]3s^2\,3p^5$
(IV) $[He]3s^2\,3p^3$
(1) I > II > III > IV
(2) III > I > IV > II
(3) I > II > III > IV
(4) II > III > IV > I

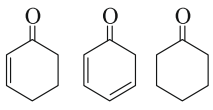
52. Which of the following halides is iso-butyl bromide?
(1) $CH_3CH_2CHBrCH_3$
(2) $CH_3CH_2CH_2CH_2Br$
(3) $CH_3C(CH_3)_2Br$
(4) $CH_3CH(CH_3)CH_2Br$

53. What will be the total number of atoms in 360 g of $C_6H_{12}O_6$?
(1) 12 N_A (2) 24 N_A
(3) 36 N_A (4) 48 N_A

54. The freezing point depression constant (K_f) of benzene is 5.12 K kg /mol. The freezing point depression for the solution 0.048 m containing a non-electrolyte solute in benzene is (rounded off upto two decimal places) ;
(1) 0.25K (2) 0.4K
(3) 0.8K (4) 0.6K

55. The ionization isomer of $[Mn(H_2O)_4Cl(NO_2)]Cl$ is :
(1) $[Mn(H_2O)_4(O_2N)]Cl_2$
(2) $[Mn(H_2O)_4Cl_2](NO_2)$
(3) $[Mn(H_2O)_4Cl(ONO)]Cl$
(4) $[Mn(H_2O)_4Cl_2(NO_2)].H_2O$

56. Which of the following will have highest enol content?



(I) (II) (III)

(1) (I)
(2) (II)
(3) (III)
(4) All have equal enol content

57. Water gas is produced by :

(1) Passing steam through a red hot coke bed

(2) Saturating hydrogen with moisture

(3) Mixing oxygen and hydrogen in a ratio of 1: 2

(4) Heating a mixture of CO_2 and CH_4 in petroleum refineries

58. Four faradays of electricity is passed through a solution of $CuSO_4$. The mass of copper deposited at the cathode is: (At. mass of Cu = 63.5 amu).

(1) 63.5g

(2) 2 g

(3) 127 g

(4) 0 g

59. Cyclohexanone can be easily converted to cyclohexane by.

(1) Cannizzaro reaction

(2) Aldol condensation reaction

(3) Wolff-Kishner reduction

(4) None of the above

60. Consider the following reduction processes:

$Zn^{2+} + 2e^- \rightarrow Zn$ (s) ; $E° = -0.76$ V

$Ca^{2+} + 2e^- \rightarrow Ca$ (s) ; $E° = -2.86$ V

$Mg^{2+} + 2e^- \rightarrow Mg$ (s) ; $E° = -2.36$ V

$Ni^{2+} + 2e^- \rightarrow Ni$ (s) ; $E° = -0.25$ V

The reducing power of the metals increases in the order:

(1) Ca < Mg < Zn < Ni

(2) Ni < Zn < Mg < Ca

(3) Ca < Zn < Mg < Ni

(4) Zn < Mg < Ni < Ca

61. In pseudo unimolecular reactions

(1) both the reactants are present in low concentration

(2) both reactants are present in the same concentration

(3) one of the reactant is present in excess

(4) one of the reactant is non-reactive

62. Ketone can be obtained by oxidation of:

(1) Primary alcohol

(2) Secondary alcohol

(3) Tertiary alcohol

(4) All of these

63. **Assertion:** Diamond is a good conductor of electricity :

Reason: Graphite is a bad conductor of electricity.

(1) Both the Assertion and the Reason are correct, and the Reason is a correct explanation of the Assertion

(2) Both the Assertion and the Reason are correct, but the Reason is not a correct explanation of the Assertion

(3) The Assertion is correct but the Reason is incorrect

(4) Both the Assertion and the Reason are incorrect

64. When alcohol is treated with a carboxylic acid in the presence of Conc. H_2SO_4, then a sweet-smelling compound is formed. The functional group in the sweet-smelling compound will be:

(1) Ester

(2) Amine

(3) Amide

(4) Aldehyde

65. A catalyst alters, which of the following in a chemical reaction?

(1) Entropy

(2) Enthalpy

(3) Internal energy

(4) Activation energy

66. In an octahedral geometry, the pair of d orbitals involved in d^2sp^3 hybridization is:

(1) $d_{x^2-y^2}, d_{z^2}$

(2) $d_{xz}, d_{x^2-y^2}$

(3) d_{z^2}, d_{xz}

(4) d_{xy}, d_{yz}

67. If neon is added to the equilibrium $2NO(g) + O_2(g) \rightleftharpoons 2NO_2(g)$ at constant volume, then equilibrium will

(1) Shift in the forward direction

(2) Shift in the reverse direction

(3) Not shift in any direction

(4) None of these

68. Identify the correct statement. :

(1) Plaster of Paris can be obtained by the hydration of gypsum

(2) Plaster of Paris is obtained by the partial oxidation of gypsum

(3) Gypsum contains a lower percentage of calcium than Plaster of Paris

(4) Gypsum is obtained by heating Plaster of Paris

69. For a zero order reaction, if initial conc. Of reactant is doubled, half-life time will be
(1) Halved
(2) doubled
(3) tripled
(4) Remains unchanged

70. Poly-β-hydroxybutyrate-Co-β-hydroxy valerate (PHBV) is a copolymer of:
(1) 3-hydroxybutanoic acid and 2-hydroxypentanoic acid
(2) 2-hydroxybutanoic acid and 3-hydroxypentanoic acid
(3) hydroxybutanoic acid and hydroxypentanoic acid
(4) 3-hydroxybutanoic acid and 3-hydroxypentanoic acid

71. Dihydrogen of high purity (> 99.95%) is obtained by:
(1) The electrolysis of acidified water using Pt electrodes
(2) The electrolysis of warm aq. $Ba(OH)_2$ using Ni electrodes.
(3) The electrolysis of Brine solution
(4) The reaction of Zn with dilute HCl

72. $Na_2B_4O_7.10H_2O \xrightarrow{\Delta} X + NaBO_2 + H_2O$

$X + Cr_2O_3 \xrightarrow{\Delta} Y\,(\text{Green coloured})$

X and Y are
(1) Na_3BO_3 and $Cr(BO_2)_3$
(2) $Na_2B_4O_7$ and $Cr(BO_2)_3$
(3) B_2O_3 and $Cr(BO_2)_3$
(4) B_2O_3 and $CrBO_3$

73. The monomers of Nylon - 6,6 is
(1) Adipic acid and Hexamethylenediamine
(2) Adipic acid and pentamethylenediamine
(3) Tartaric acid and Hexamethylenediamine
(4) Hexanoic acid and Hexamethylenediamine

74. The theoretical density of ZnS is d g/cm^3. If the crystal has a 10% Frenkel defect, then the actual density of ZnS should be :
(1) d g/cm^3 (2) 0.04d g/cm^3
(3) 0.96d g/cm^3 (4) 1.04d g/cm^3

75. For a given reaction, ΔH = 30 KJ/mol and ΔS = 82 JK^{-1} mol^{-1}. The reaction will be spontaneous at:
(1) T > 366 K
(2) T < 366 K
(3) T > 250 K
(4) All temperature

76. If the ratio of rates of diffusion of two gases X and Y is 2:3, the ratio of their densities is:
(1) 4:9 (2) 1:8
(3) 9:4 (4) 3:7

77. Formation of a solution from two components can be considered as:
(i) Pure solvent → separated solvent molecules, ΔH_1
(ii) Pure solute → separated solute molecules, ΔH_2
(iii) Separated solvent and solute molecule → solution, ΔH_3
(1) $\Delta_{Sol}H = \Delta H_1 + \Delta H_2 + \Delta H_3$
(2) $\Delta_{Sol}H = \Delta H_1 + \Delta H_2 - \Delta H_3$
(3) $\Delta_{Sol}H = \Delta H_1 - \Delta H_2 - \Delta H_3$
(4) $\Delta_{Sol}H = \Delta H_3 + \Delta H_1 + \Delta H_2$

78. Which alkene on ozonolysis give CH_3CH_2CHO and CH_3CHO?
(1) 1-pentene (2) 2-pentene
(3) 2-butene (4) None of the above

79. Arrange the following 3d metal oxides in the decreasing order of their oxidation numbers.
(a) CrO_3;
(b) Fe_2O_3;
(c) MnO_2;
(d) V_2O_5;
(e) Cu_2O;
(1) (d) > (a) > (b) > (c) > (e)
(2) (a) > (c) > (d) > (b) > (e)
(3) (a) > (d) > (c) > (b) > (e)
(4) (c) > (a) > (d) > (e) > (b)

80. Which one of the following compounds gives a yellow precipitate on treatment with NaOH + I_2?
(1) 2-pentanone
(2) 3-pentanone
(3) Ethyl alcohol
(4) Both 1 and 3

81. **Assertion:** Aqueous gold colloidal solution is red.
Reason: The colour arises due to the scattering of light by colloidal gold particles;
(1) Both the assertion and the reason are correct, and the reason is a correct explanation of the assertion
(2) The assertion and the reason are correct, but the reason is not a correct explanation of the assertion
(3) The assertion is correct, but the reason is incorrect
(4) Both the assertion and the reason are incorrect

82. Which of the following statements about the advantage of roasting sulphide ore before reduction is true?

a. The $\Delta_f G^o$ of the sulphide is greater than that for CS_2 and H_2S

b. The ΔG is negative for roasting sulphide ore to oxide.

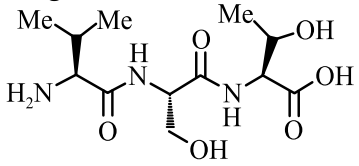
c. Roasting sulphide to oxide is thermodynamically feasible

d. Carbon and hydrogen are suitable reducing agents for metal sulphides

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

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

83. The correct sequence of amino acids present in the tripeptide given below is:



(1) Val - Ser – Thr (2) Thr - Ser – Val

(3) Leu - Ser – Thr (4) Thr - Ser – Leu

84. The vapour pressure of the solution of two liquids A (P^o = 80 mm Hg) and B (P^o = 120 mm Hg) is found to be 110 mm Hg when χ_A = 0.4. The result shows that:

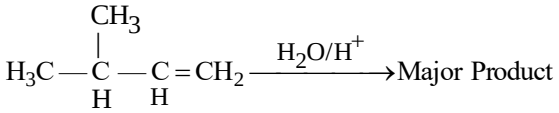
(1) Solution exhibits ideal behaviour

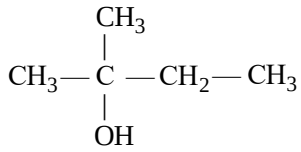
(2) Solution shows positive deviations

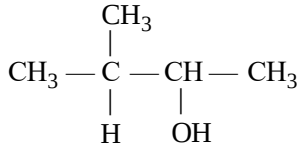
(3) Solution shows negative deviations

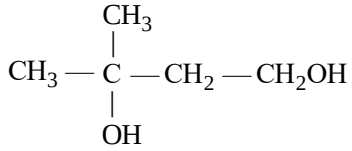
(4) Solution will show positive deviations for lower concentrations and negative deviations for higher concentrations

85. What will be the major product of the following reaction:



(1) 

(2) 

(3) 

(4) None of the above

SECTION - B

86. Which of the following is permissible?

(1) n = 4, l = 4, m = 0

(2) n = 4, l = 2, m = 3

(3) n = 4, l = 4, m = –1

(4) n = 4, l = 0, m = 0

87. If the volume of a given mass of a gas at constant temperature becomes twice, the pressure will be:

(1) 4P (2) P/3

(3) 2P (4) P/2

88. Protective sols are:

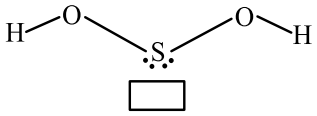
(1) Lyophilic

(2) Lyophobic

(3) Both (1) and (2)

(4) None of these

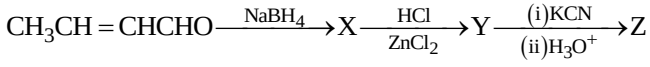
89. Find the oxidation number of S from the structure. (H_2SO_2, Sulfoxylic acid)



(1) +1 (2) 0

(3) +2 (4) +6

90. Identify 'Z' in the sequence of reactions



(1) $CH_3CH = CHCH_2COOH$

(2) $CH_3CH_2CH_2OH$

(3) $CH_3CH = CHCOOH$

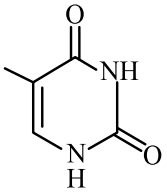
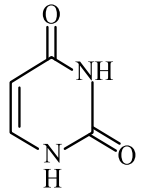
(4) $CH_3CH(Cl)CH_2COOH$

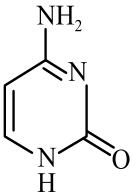
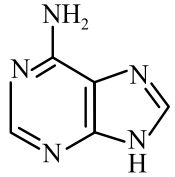
91. The unit of rate constant for the reaction $2H_2 + 2NO \rightarrow 2H_2O + N_2$ which has rate $= K[H_2][NO]^2$, is

(1) mol L^{-1} s^{-1} (2) s^{-1}

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

92. DNA contains Adenine, Thymine, Guanine, and Cytosine. The structure of Thymine will be:

(1)  (2) 

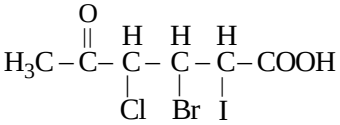
(3)  (4) 

93. The yellow coloured solution of Na_2CrO_4 changes to orange red on passing CO_2 gas due to formation of:
(1) CrO_5
(2) CrO_3
(3) $Na_2Cr_2O_7$
(4) Na_3CrO_8

94. What will be the shape of XeO_4?
(1) Square planar
(2) Tetrahedral
(3) T-shaped
(4) Linear

95. Which of the following reagents will be able to distinguish between 1 -pentyne and 2 – pentyne?
(1) HCl
(2) O_2
(3) $NaNH_2$
(4) Cl_2

96. The IUPAC name of the following compound is:



(1) 3-bromo-4-chloro-2-iodo-5-oxohexanoic acid
(2) 3-bromo-4-chloro-2-iodo-5-oxopentanoic acid
(3) 4-chloro-3-bromo-5-oxo-2-iodohexanoic acid
(4) 2-iodo-3-bromo-4-chloro-5-oxohexanoic acid

97. Biochemical Oxygen Demand (BOD) value can be a measure of water pollution caused by organic matter. Which of the following statements is correct?
(1) Aerobic bacteria decrease the BOD value;
(2) Anaerobic bacteria increase the BOD value;
(3) Clean water has a BOD value > 10 ppm;
(4) Polluted water has a BOD value > 10 ppm;

98. **Assertion:** Specific heat is an intensive property.
Reason: Heat capacity is an intensive property.
(1) Both assertion & reason are true and the reason is the correct explanation of the assertion.
(2) Both assertion & reason are true but the reason is not the correct explanation of the assertion.
(3) Assertion is a true statement but the reason is false.
(4) Both assertion and reason are false statements.

99. For the reaction, Ni (s) + 4CO (g) ⇌ $Ni(CO)_4$ (g), the equilibrium constant K_c is:
(1) $K_c = [Ni(CO)_4]/[CO]^4$
(2) $K_c = [Ni]/[CO]^4$
(3) $K_c = [Ni]\,[Ni(CO)_4]/[CO]^4$
(4) $K_c = [Ni]\,[Ni(CO)_4]$

100. The number of S-S bonds in Marshall's acid will be
(1) 2 (2) 0
(3) 1 (4) 5

SECTION-III (BOTANY)

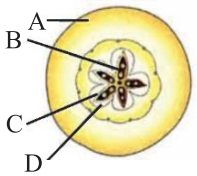
SECTION - A

101. Consider the following statements about pollen grains and choose the correct statements
(a) In 40% of angiosperms, pollen grains shed at 3-celled stage.
(b) Intine is thin and continuous layer.
(c) Exine is a continuous layer and made up of non-resistant organic material.
(d) Nucleus of vegetative cell is regularly shaped.
(e) Generative cell is spindle shaped and its cytoplasm is dense.
(1) Only a, b, e are correct
(2) Only b, d, e are correct
(3) Only a, b, d, e are correct
(4) All are correct

102. Body of the megasporangium fuses with funicle in the region called
(1) Micropyle (2) Nucellus
(3) Hilum (4) Chalaza

103. The type of pollination which brings genetically different types of pollen grains to the stigma
(1) Geitonogamy
(2) Xenogamy
(3) Chasmogamy
(4) Both a and b

104.



In the given diagram, label the parts A, B, C, D.

	A	B	C	D
(1)	Seed	Thalamus	Mesocarp	Endocarp
(2)	Thalamus	Seed	Mesocarp	Endocarp
(3)	Thalamus	Seed	Endocarp	Mesocarp
(4)	Seed	Thalamus	Endocarp	Mesocarp

105. The common asexual reproductive structures in *Penicillium* are
(1) Conidia
(2) Zoospores
(3) Bulbil
(4) Gemmules

106. An organism showing a dominant phenotype and whose genotype is to be determined is crossed with a recessive parent. This type of cross is
(1) Back cross
(2) Test cross
(3) Self crossing
(4) Both (1) and (2)

107. Phenotypic and genotypic ratios are equal and same in case of
(1) Dominance
(2) Co-dominance
(3) Independent assortment
(4) Incomplete dominance

108. Starch synthesis in pea seeds is
(1) Incomplete dominance
(2) Multiple allelism
(3) Inheritance of two genes
(4) Dominance

109. Identify the incorrectly matched pair
(1) Human skin colour – Pleiotropy
(2) Rudimentary ovary – Turner's syndrome
(3) Point mutation – Sickle cell anaemia
(4) Sex linked recessive disorder – Colour blindness

110. The correct sequence of taxonomical categories is
(1) Class → Phylum → Order → Family → Genus → Species
(2) Phylum → Class → Order → Family → Genus → Species
(3) Phylum → Order → Class → Family → Genus → Species
(4) Class → Phylum → Order → Family → Species → Genus

111. In a polynucleotide chain
(1) A nitrogenous base is linked to OH of 1'C pentose sugar through N- Glycosidic linkage.
(2) Two nucleotides are linked through 3'-5' phosphoester bond.
(3) Phosphate group linked to OH of 5'C of nucleoside through phosphodiester bond.
(4) Backbone of polynucleotide chain is formed due to nitrogenous base and sugar.

112. Genetic information flows from DNA → RNA → Protein. This was proposed by
(1) James Watson
(2) Francis Crick
(3) Maurice Wilkins
(4) Both (1) and (2)

113. **Assertion:** Only one strand of DNA is copied into RNA during transcription.
Reason: Double stranded RNA prevent RNA from being translated into protein.
(1) Both assertion and reason are true but reason is correct explanation of assertion
(2) Both assertion and reason are true but reason is not correct explanation of assertion
(3) Assertion is true but reason is false
(4) Assertion is false but reason is true

114. Match the following

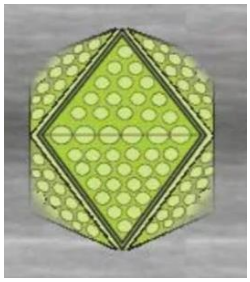
(A)	DNA polymerase	(i)	mRNA processing
(B)	RNA polymerase III	(ii)	RNA polymerase
(C)	RNA polymerase I	(iii)	Okazaki fragments
(D)	Splicing	(iv)	SnRNAs
(E)	Rho factor	(v)	rRNA

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

115. Base sequence in a strand of mRNA is 5'AUG GAC CUG AUA UUU UGA3'. What is the base sequence of DNA strand from which it has been transcribed?
(1) 5'TAC CTC GAT ATT TAA AGT3'
(2) 5'TAC CTG GAC TAT AAA ACT3'
(3) 5'TAC CTG CAC TAT AAA ACT3'
(4) 5'TAC CTG GAC TTA TTT ACT3'

116. A new breed of sheep hisardale developed in Punjab is produced by which breeding method
(1) Cross-breeding
(2) Out-breeding
(3) Out-crossing
(4) Interspecific hybridisation

117. Resistant to yellow mosaic virus and powdery mildew in mung bean is provided by which breeding method
(1) Interspecific hybridisation
(2) Conventional breeding
(3) Mutation breeding
(4) Both (2) and (3)

118. 

The given diagram showing which of the following organism causing _____ disease?

(1) Adenovirus – Respiratory infections
(2) TMV – Mosaic disease
(3) HIV – AIDS
(4) *Streptococcus* – Respiratory disease

119. Which of the following is a wrong matching of a microbe and its industrial product?

(1) Yeast – Statins
(2) *Aspergillus niger* – Citric acid
(3) *Trichoderma polysporum* – Cyclosporin-A
(4) *Clostridium* – Acetic acid

120. In a lake, there are 40 lotus plants last year and through reproduction 12 new lotus plants are added, taking current population to 52, birth rate in the population is _____ offspring per lotus per year

(1) 3.0
(2) 0.7
(3) 0.3
(4) 0.2

121. The carrying capacity of environment for a given population can be represented by

(1) $\frac{dN}{dt} = rN - \frac{1}{K}$

(2) $\frac{dN}{dt} = rN\left(1 - \frac{N}{K}\right)$

(3) $\frac{dN}{dt} = r\left(\frac{K - N}{K}\right)$

(4) $\frac{dN}{dt} = rN - \frac{N}{K}$

122. Consider the following statements:

Statement I: An overwhelming majority of animals and nearly all plants maintain a constant internal environment.

Statement II: Desert plants developed CAM pathway to avoid water loss. It enable their stomata to remain closed during day time.

(1) Both statements are correct
(2) Both statements are incorrect
(3) Only statement I is correct
(4) Only statement II is correct

123. Primary succession occurs in which of the following areas:

(1) Bare rock
(2) Reservoir
(3) Newly cooled lava
(4) All of the above

124. Arrange the following stages of primary succession in a sequential order of their occurrence

(i) Reed-swamp stage
(ii) Phytoplankton
(iii) Marsh meadow stage
(iv) Scrub stage
(v) Submerged free-floating stage

(1) ii → v → i → iii → iv
(2) ii → i → v → iii → iv
(3) v → ii → i → iii → iv
(4) ii → v → iii → i → iv

125. The IUCN red list (2004) documented the extinction of how many invertebrates species?

(1) 338 (2) 379
(3) 359 (4) 378

126. Air prevention and control of pollution act was amended in which year to include noise as an air pollutant

(1) 1986 (2) 1987
(3) 1974 (4) 1981

127. Identify the correct statement about protists

(1) Slime moulds are saprophytic protists during unfavourable conditions they from plasmodium.
(2) Flagellated protozoans are only parasitic forms and causes disease like sleeping sickness.
(3) Protozoans are believed to be primitive relative of animals.
(4) Euglenoids have a lipid rich layer which makes their body flexible.

128. Which is not a significance of mitosis?

(1) It helps in conservation of specific chromosome number of each species.
(2) It helps in restoring the nucleocytoplasmic ratio.
(3) It helps in growth and development of zygote into adult through embryo formation.
(4) It helps in secondary growth in plants.

129. Heterosporous *Selaginella* belongs to which class of pteridophyta

(1) Lycopsida (2) Sphenopsida
(3) Pteropsida (4) Psilopsida

130. Floral formula of cauliflower is

(1) $\oplus ♀♂ k_5 C_4 A_{2+4} G_{(2)}$

(2) $\oplus ♀♂ k_5 C_5 A_5 \underline{G}_{(2)}$

(3) $\% ♀♂ k_4 C_4 A_{2+2} \underline{G}_{(2)}$

(4) $\oplus ♀♂ k_{2+2} C_4 A_{2+4} \underline{G}_{(2)}$

131. Buds in plants protect themselves by presence of

(1) Bud scales

(2) Folded leaves

(3) Hair

(4) All of these

132. Match the following columns

Column I (Aestivation)		Column II (Examples)	
A.	Valvate	i.	Cotton
B.	Imbricate	ii.	*Cassia*
C.	Twisted	iii.	Bean
D.	Vexillary	iv.	*Calotropis*

	A	B	C	D
(1)	iv	i	iii	ii
(2)	iv	ii	i	iii
(3)	i	iii	ii	iv
(4)	ii	iv	i	iii

133. Which of the following elements is needed in very small amounts?

(1) Phosphorus (2) Magnesium

(3) Sulphur (4) Copper

134. At incipient plasmolysis, water potential (ψ_w) is equal to

(1) ψ_p (2) ψ_s

(3) $\psi_s + \psi_p$ (4) $\psi_p + \psi_s + \psi_m$

135. **Statement I:** Cyclic electron transport in photosynthesis is only concerned with ATP production.

Statement II: In C_4 plants first stable product formed is oxalo-acetic acid.

(1) Both statements are correct

(2) Both statements are incorrect

(3) Only statement I is correct

(4) Only statement II is correct

SECTION - B

136. NADPH is generated through

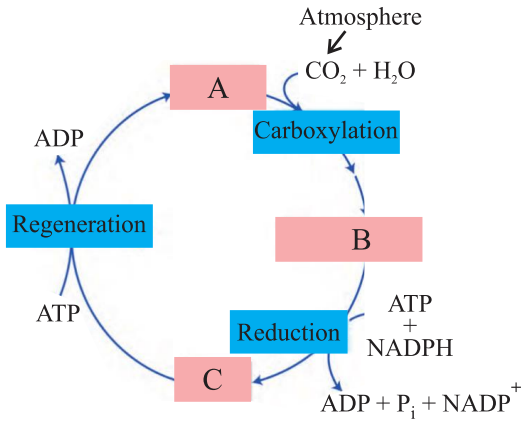
(1) PS I

(2) Glycolysis

(3) PS II

(4) All of these

137.



Calvin cycle proceeds in three stages carboxylation, reduction and regeneration. Identify A, B, C in the given cycle:

(1) Triose phosphate, Ribulose 1, 5 bisphosphate, 3-phosphoglycerate

(2) Ribulose 1, 5 bisphosphate, 3-phosphoglycerate, Triose phosphate

(3) Ribulose 1, 5 bisphosphate, Triose phosphate, 3-phosphoglycerate

(4) 3-phosphoglycerate, Ribulose 1, 5 bisphosphate, Triose phosphate

138. During glycolysis in which step $NADH + H^+$ is formed from NAD^+

(1) When PGAL is converted to BPGA

(2) When BPGA is converted to PGA

(3) When fructose 1, 6 bisphosphate is converted to PGAL

(4) None of the above is correct

139. Oxidation of three molecule of $FADH_2$ will produce how many ATP molecules

(1) 8 (2) 6

(3) 3 (4) 9

140. Which of the following is not a physiological effect of Auxins?

(1) They promote and initiate cell division in tissues like cambium.

(2) They promote flowering in plants like pineapples.

(3) In higher plants, Auxins in apical bud inhibit the development of lateral buds.

(4) They causes fruits to elongate and improve its shape.

141. What will happen if cytokinin is not being added in a culture medium?

(1) Process of growth will increase.

(2) Process of cell division, differentiation and growth will become slow.

(3) Cells will stop differentiation.

(4) Remain unaffected.

142. Which of the following hormones is not found in plants?
(1) IBA (2) IAA
(3) GA_2 (4) NAA

143. Arrange the following organisms in decreasing order of their size
(1) Bacteria > PPLO > Viruses > Viroids
(2) PPLO > Bacteria > Viroids > Viruses
(3) Bacteria > PPLO > Viruses > Viroids
(4) PPLO > Viruses > Bacteria > Viroids

144. Nucleolus is site of synthesis of which of the following molecule
(1) rRNA
(2) DNA
(3) tRNA
(4) srRNA

145. Which cell organelle is associated with secretory activity of cell?
(1) Mitochondria
(2) Golgi body
(3) ER
(4) Lysosomes

146. Nuclear envelope develops around the chromosome clusters at each pole forming two daughter nuclei during:
(1) Anaphase
(2) Late metaphase
(3) Cytokinesis
(4) Telophase

147. **Assertion:** Moss like *Funaria* is amphibious in nature.
Reason: Mosses possess vascular tissues. They need moisture for fertilization.
(1) Both assertion and reason are true but reason is correct explanation of assertion
(2) Both assertion and reason are true but reason is not correct explanation of assertion
(3) If assertion is true but reason is false
(4) If assertion is false but reason is true

148. Desynapsis of homologous chromosomes begins in which stage of cell division
(1) Diplotene (2) Metaphase I
(3) Diakinesis (4) Zygotene

149. **Assertion:** Entry of water from soil into xylem takes place through gradient of suction pressure.
Reason: Water moves from a place of higher suction pressure to place of lower suction pressure.
(1) Both assertion and reason are true but reason is correct explanation of assertion
(2) Both assertion and reason are true but reason is not correct explanation of assertion
(3) If assertion is true but reason is false
(4) If assertion is false but reason is true

150. Identify the incorrect matched pair
(1) Mg^{2+} – Phosphoenol pyruvate carboxylase
(2) Sulphur – Ferredoxin
(3) Mn – Nitrogenase
(4) Zn^{2+} – Alcohol dehydrogenase

SECTION-IV (ZOOLOGY)

SECTION - A

151. Second largest phylum of animal kingdom is
(1) Arthropoda
(2) Mollusca
(3) Annelida
(4) Aschelminthes

152. Mantle is the characterstic feature of
(1) Annelida
(2) Arthropoda
(3) Mollusca
(4) Echinodermata

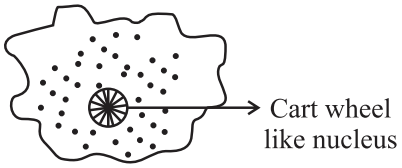
153. *Chaetopleura* is
(1) Chiton
(2) Sea-hare
(3) Fresh water mussel
(4) Giant-squid

154. **Statement I:** Water vascular system help in locomotion capture and transport of food and respiration.
Statement II: Hemichordates have well developed notochord
Choose the appropriate option:
(1) Statement I is correct but statement II is incorrect
(2) Statement I is incorrect but statement II is correct
(3) Both statement I and II are correct
(4) Both statement I and II are incorrect

155. Choose the incorrect match.
(1) Gregarious pest – *Locusta*
(2) Living fossil – *Limulus*
(3) Vector – *Laccifer*
(4) Economically important insect – *Apis*

156. The development of *Periplanata americana* is
(1) Holometabolous
(2) Paurometabolous
(3) Hemimetabolous
(4) Ametabolous

157. The given structure is of



(1) Mast cell (2) Adipocyte
(3) Lymphocyte (4) Plasma cells

158. Epimysium is the covering of
(1) Heart (2) Bone
(3) Cartilage (4) Muscle

159. Choose the incorrect statement about Chargaff's rule
(1) The amount of purines and pyrimidine are equal
(2) The amount of adenine is always equal to thymine and the amount of guanine is always equal to that of cytosine
(3) The base ratio may vary from one species to another
(4) The deoxyribose sugar phosphate component occur in unequal proportion.

160. Arachidonic acid has
(1) 20 carbons excluding carboxyl carbon
(2) 20 carbons including carboxyl carbon
(3) 16 carbons excluding carboxyl carbon
(4) 16 carbons including carboxyl carbon

161. Factor affecting enzyme activity are
(1) Temperature
(2) pH
(3) Substrate concentration
(4) All of these

162. Hydroxymethyl is the side chain of which amino acid?
(1) Tyrosine (2) Serine
(3) Cysteine (4) Tryptophan

163. A molecule of ATP bears maximum resemblance to
(1) Palmtitic acid (2) Amino acid
(3) DNA nucleotide (4) RNA nucleotide

164. Co-factor for cytochrome oxidase is
(1) Iron (2) Zinc
(3) Magnesium (4) Chlorine

165. Oesophagus is characterised by except
(1) Absence of digestive gland
(2) Presence of mucus-secreting goblet cells
(3) Presence of only voluntary muscle fibre
(4) Presence of voluntary (in anterior $1/3^{rd}$ and involuntary muscle fibres (in posterior $2/3^{rd}$)

166. In which layer of stomach are gastric glands located?
(1) Serosa
(2) Mucosa
(3) Submucosa
(4) Muscularis mucosa

167. Proteins _____ Proteoses + Peptones.
(1) HCL
(2) Bile
(3) Pepsin
(4) All of these

168. **Assertion (A):** Vomiting is the ejection of stomach contents through mouth.
Reason (R): This reflex action is controlled by the vomit centre in medulla
Choose the appropriate option:
(1) (A) is the correct but (R) is incorrect
(2) (A) is not correct but (R) is correct
(3) Both (A) and (R) are correct but (R) is the correct explanation of (A)
(4) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

169. Lungs are enclosed by
(1) Plasma membrane
(2) Pleural membrane
(3) Perichondrium
(4) Periosteum

170. Function of pleural fluid is
(1) Lubricate the pleural membrane
(2) Lubricate the lungs
(3) Lubricate the alveoli
(4) Lubricate the bronchi

171. In humans, thoracic chamber is formed dorsally by the ___A___ and ventrally by the ___B___.
Choose the option which fills the blanks correctly.
(1) Ribs, Diaphragm
(2) Vertebral column, Sternum
(3) Ribs, Sternum
(4) Diaphragm, Ribs

172. **Statement I:** ABO blood grouping was discovered by Alfred Rucsel.
Statement II: ABO blood grouping is based on surface antibody present in RBCs.
Choose the appropriate option:
(1) Statement I is correct but statement II is incorrect
(2) Statement I is incorrect but statement II is correct
(3) Both statement I and statement II are correct
(4) Both statement I and statement II are incorrect

173. **Assertion (A):** In myogenic heart impulse for heartbeat arises in heart muscle.
Reason (R): In Neurogenic heart impulse for heart beat arises from nerves.
Choose the appropriate option:
(1) (A) is correct but (R) is not correct
(2) (A) is not correct but (R) is correct
(3) Both (A) and (R) are correct and (R) is the correct explanation of (A)
(4) Both (A) and (R) are correct and (R) is not the correct explanation of (A)

174. Which of the following does not contains clotting factors?
(1) Plasma of blood (2) Plasma of lymph
(3) Serum (4) Blood

175. Cortical portion of kidney projecting between the medullary pyramids in human kidney are called
(1) Vasa recta
(2) Juxtaglomerular apparatus
(3) Columns of Bellini
(4) Column of Bertini

176. Dislocation is
(1) Displacement of articular surface of joint
(2) Twisting of joint without dislocating it
(3) Degenerative joint disease
(4) Type of arthritis

177. Joint between carpel and metacarpel of human thumb is
(1) Ball and socket joint
(2) Hinge joint
(3) Sadle joint
(4) Gliding joint

178. Inhibitory neurotransmitter is
(1) Norepinephrine (2) Epinephrine
(3) GABA (4) Glutamate

179. In human beings, a typical nerve cell is
(1) Bipolar (2) A polar
(3) Multipolar (4) Pseudounipolar

180. Cholecystokinin is released from
(1) Pancreas (2) Duodenum
(3) Gall bladder (4) Liver

181. Iodothyronines are
(1) Peptide hormone
(2) Steroid hormone
(3) Thyroid hormone
(4) Amino-acid derivatives

182. The ovarian stoma is divided into _____ zone
(1) 2 (2) 3
(3) 4 (4) 5

183. Acrosome is a part of sperm
(1) Head (2) Neck
(3) Middle (4) Tail

184. The blastomere in blastocyst are arranged into outer layer of
(1) Inner cell mass (2) Trophoblast
(3) Amnion (4) Chrion

185. By the end of first trimester, which of the following has occurred in the foetus?
(1) The foetus uses its lungs to breathe
(2) The brain of foetus is fully developed
(3) Most of the organ system are formed
(4) The first movement of the foetus occur

SECTION - B

186. Gonorrhoea is a disease caused by
(1) Algae (2) Bacteria
(3) Fungi (4) Virus

187. Example of homologous organs are
(1) Thorns of *Bougainvillea* and tendril of *cucurbiota*
(2) The wings of butterfly and of birds
(3) Eye of octopus and of mammals
(4) Sweet potato and potato

188. Ontogeny is recapitulation of phylogeny is given by
(1) Ernst mayer
(2) Ernst haeckel
(3) Ernst von bear
(4) All of these

189. Lichens are symbiotic association of
(1) Algae and fungus
(2) Cycus and fungus
(3) Fungus and pinus
(4) Animals and monera

190. Which of the following organisms are thought to be evolved into first amphibians?
(1) *Petromyzon*
(2) *Lamphery*
(3) Coelacanth
(4) *Ascidia*

191. Who is the first animal on the earth that has collected evidences of his origin and evolution?
(1) *Homo sapiens*
(2) *Pteropus*
(3) *Canis*
(4) *Felis*

192. 'Java man' is known as
(1) *Homo erectus*
(2) *Homo habilis*
(3) *Neanderthal*
(4) *Australpothecies*

193. Diptheria is caused by
(1) Nematodes (2) Bacteria
(3) Virus (4) None of these

194. **Assertion (A):** Benign tumor remains confined to their original location and donot spread to other parts.
Reason (R): Benign tumor show the property of metastasis
Choose the appropriate option:
(1) (A) is correct but (R) is not correct
(2) (A) is not correct but (R) is correct
(3) Both (A) and (R) are correct and (R) is the correct explanation of (A)
(4) Both (A) and (R) are correct and (R) is not the correct explanation of (A)

195. HIV has a protein coat and a genetic material which is
(1) dsRNA (2) dsDNA
(3) ssDNA (4) ssRNA

196. Which of the following is edible marine fish?
(1) *Hilsa* (2) *Labeo*
(3) *Catla* (4) *Clarias*

197. Biotechnology reveals use of
(1) Microorganisms in industrial process
(2) rDNA
(3) Engineered bacteria for production of antibiotics and antibodies
(4) All of these

198. Bacteria protect themselves from virus attack by producing.
(1) Exonuclease (2) Endonuclease
(3) DNA ligase (4) DNA polymerase

199. Normal *E. coli* cells carry resistance against which of the following antibiotics.
(1) Chloramphenicol
(2) Ampicillin
(3) Tetracycline
(4) None of these

200. Which of the following represents a palindromic sequence in DNA?
(1) 5'–GAATTC–3' (2) 5'–CCAATG–3'
3'–CTTAAG–5' 3'–CAATTC–5'
(3) 5'–CATTAG–3' (4) 5'–GATACC–3'
3'–GATAAC–5' 3'–CCTAAG–5'

Test Series (2023)

Mock Test-07

NEET

DURATION : 200 Minutes | 16/04/2023 | M. MARKS : 720

ANSWER KEY

PHYSICS		CHEMISTRY		BOTANY		ZOOLOGY	
1.	(2)	51.	(2)	101.	(1)	151.	(2)
2.	(4)	52.	(4)	102.	(3)	152.	(3)
3.	(3)	53.	(4)	103.	(2)	153.	(1)
4.	(3)	54.	(1)	104.	(3)	154.	(1)
5.	(4)	55.	(2)	105.	(1)	155.	(3)
6.	(4)	56.	(2)	106.	(2)	156.	(2)
7.	(2)	57.	(1)	107.	(4)	157.	(4)
8.	(1)	58.	(3)	108.	(1)	158.	(4)
9.	(4)	59.	(3)	109.	(1)	159.	(4)
10.	(3)	60.	(2)	110.	(2)	160.	(2)
11.	(4)	61.	(3)	111.	(1)	161.	(4)
12.	(4)	62.	(2)	112.	(2)	162.	(2)
13.	(2)	63.	(4)	113.	(1)	163.	(4)
14.	(3)	64.	(1)	114.	(4)	164.	(1)
15.	(1)	65.	(4)	115.	(2)	165.	(3)
16.	(3)	66.	(1)	116.	(1)	166.	(2)
17.	(2)	67.	(3)	117.	(3)	167.	(3)
18.	(4)	68.	(3)	118.	(1)	168.	(4)
19.	(1)	69.	(2)	119.	(4)	169.	(2)
20.	(2)	70.	(4)	120.	(3)	170.	(1)
21.	(4)	71.	(2)	121.	(2)	171.	(2)
22.	(2)	72.	(3)	122.	(4)	172.	(4)
23.	(1)	73.	(1)	123.	(4)	173.	(4)
24.	(3)	74.	(1)	124.	(1)	174.	(3)
25.	(1)	75.	(1)	125.	(3)	175.	(4)
26.	(1)	76.	(3)	126.	(2)	176.	(1)
27.	(4)	77.	(1)	127.	(3)	177.	(3)
28.	(4)	78.	(2)	128.	(1)	178.	(3)
29.	(1)	79.	(3)	129.	(1)	179.	(3)
30.	(3)	80.	(4)	130.	(4)	180.	(2)
31.	(1)	81.	(1)	131.	(4)	181.	(3)
32.	(4)	82.	(2)	132.	(2)	182.	(1)
33.	(2)	83.	(1)	133.	(4)	183.	(1)
34.	(3)	84.	(2)	134.	(2)	184.	(2)
35.	(3)	85.	(1)	135.	(1)	185.	(3)
36.	(1)	86.	(4)	136.	(1)	186.	(2)
37.	(3)	87.	(4)	137.	(2)	187.	(1)
38.	(4)	88.	(1)	138.	(1)	188.	(2)
39.	(3)	89.	(3)	139.	(2)	189.	(1)
40.	(3)	90.	(1)	140.	(4)	190.	(3)
41.	(2)	91.	(3)	141.	(2)	191.	(1)
42.	(1)	92.	(1)	142.	(4)	192.	(1)
43.	(2)	93.	(3)	143.	(3)	193.	(2)
44.	(4)	94.	(2)	144.	(1)	194.	(1)
45.	(2)	95.	(3)	145.	(2)	195.	(4)
46.	(3)	96.	(1)	146.	(4)	196.	(1)
47.	(1)	97.	(4)	147.	(3)	197.	(4)
48.	(2)	98.	(3)	148.	(1)	198.	(2)
49.	(2)	99.	(1)	149.	(3)	199.	(4)
50.	(1)	100.	(2)	150.	(3)	200.	(1)

SECTION – I (PHYSICS)

1. **(2)**

$\tan\phi = \left|\frac{X_C}{R}\right|$

$\Rightarrow \quad \tan\frac{\pi}{4} = \frac{X_C}{R}$ ... (1)

When C is removed

$\tan\phi = \frac{X_L}{R}$

$\Rightarrow \quad \tan\phi = \frac{\pi}{4} = \frac{X_L}{R}$ … (2)

Form (1) and (2)

$X_L = X_C$

The circuit is resonance.

Power factor = $\cos\phi = \frac{R}{Z} = 1$

2. **(4)**

Stress = $\frac{F}{A} = \frac{Mg}{A}$ Strain = $\frac{\Delta L}{L} = \frac{L_1}{L}$

Young's Modulus $Y = \frac{Stress}{Strain} = \frac{\frac{Mg}{A}}{\frac{L_1}{L}} = \frac{MgL}{L_1 A}$

3. **(3)**

Magnetic field at centre of solenoid

$B = \mu_0 nI$

$n = \frac{N}{L} = \frac{240}{0.4} = 600$ turns/m

$B = 10^{-7} \times 4\pi \times 600 \times 5 = 3.77 \times 10^{-3} T$

4. **(3)**

When ray emerges normally $e = 0$

$r_2 = 0$, also $r_1 + r_2 = A \therefore r_1 = A$

By Snell's law,

$\mu = \frac{\sin i}{\sin r}$

$\sin i = \mu \sin r_1$

For small angle prism $\sin\theta \simeq \theta$

$i = \mu \times r_1$

$i = \mu \times A = 1.4 \times 5° = 7°$

5. **(4)**

Electric potential is constant

$\therefore \quad E = -\frac{dV}{dr} = 0$

6. **(4)**

Bohr model is applicable for single electron species. Li^+ has more than one electron in orbit, so Bohr model is not valid.

7. **(2)**

Energy received = intensity × area × time

$50 \times 10 \times 60 = 3 \times 10^4$ J

8. **(1)**

$\lambda = \frac{12.27}{\sqrt{V}}$ Å , (V in volt)

$\sqrt{V} = \frac{12.27}{\lambda} = \frac{12.27}{1.65} = 7.436$

$V = 55$ V

9. **(4)**

$Mg_n = \frac{Mg}{\left(1+\frac{h}{R}\right)^2}$

$\therefore \quad W = \frac{63}{\left(1+\frac{R/2}{R}\right)^2} = 28$ N

10. **(3)**

Resistivity of semiconductors decreases with increase in temperature exponentially. so correct graph is (3)

11. **(4)**

In second case

$\nu' = \frac{1.7\nu_0}{2} = 0.85\ \nu_0 < \nu_0$

No photoemission results.

12. **(4)**

$I_{RMS} = \frac{E_{RMS}}{X_C}$, $X_C = \frac{1}{\omega C}$

$I_{RMS} = \omega c.\ E_{RMS}$

$\omega = 2\pi f = 2 \times \pi \times 50 = 10\pi$

$I_{RMS} = 100\ \pi \times 80 \times 10^{-6} \times 100 = 2.51$A

13. **(2)**

$\theta_R = \frac{1.22\lambda}{d}$

$\lambda = 550 \times 10^{-9}$ m. d = 1.22 m

$\theta_R = \frac{1.22 \times 550 \times 10^{-9}}{1.22} = 5.5 \times 10^{-7}$ rad

14. **(3)**

$v^2 = u^2 + 2as$

$(50)^2 = (10)^2 + 2 \times 10 \times h$

$h = \frac{2400}{20}$

$\Rightarrow \quad h = 120\ m$

15. (1)

$PV = nRT$

$$P = \frac{n}{V}RT = \frac{m}{V} \times \frac{1}{M}RT = \frac{\rho RT}{M}$$

$$\therefore \quad \rho = \frac{PM}{RT}$$

$$\rho = \frac{166 \times 10^3 \times 32 \times 10^{-3}}{8.3 \times 200} = 3.2 \text{ kg/m}^3$$

16. (3)

$${}^{235}_{92}U + {}_0n^1 \rightarrow {}^{144}_{36}Ba + 3{}_0n^1 + {}_zX^A$$

92 = 56 + Z

$\therefore$ Z = 36

Also 235+ 1 = 144 + 3 + A

236 –147 = A A = 89

It is ${}^{89}_{36}Kr$

17. (2)

On forward basing diffusion current increases and depletion layer decreases.

18. (4)

$$Y = A \sin\omega t = \omega A \sin\left(\omega t + \frac{\pi}{2}\right)$$

So velocity leads displacement equation by $\frac{\pi}{2}$ rad

19. (1)

$\chi_m = 1999$

$\mu_r = \chi_m + 1 = 2000$

$\mu = \mu_r \mu_0 = 2000 \times 4\pi \times 10^{-7}$

$= 8\pi \times 10^3 \times 10^{-7}$

$= 8\pi \times 10^{-4}$ T m A^{-1}

20. (2)

$$\Delta Q = \frac{4}{3}\pi R^3 \times \rho.S(\Delta T)$$

$$\frac{\Delta Q_1}{\Delta Q_2} = \left(\frac{r}{2r}\right)^3 = \frac{1}{8}$$

21. (4)

$$a = \left(\frac{m_1 - m_2}{m_1 + m_2}\right)g = \frac{(3-2)g}{3+2} = \frac{g}{5}$$

22. (2)

$$\lambda = \frac{1}{\sqrt{2}\pi n d^2}$$

23. (1)

$$V = \frac{KP\cos\theta}{r^2}$$

$\theta = 0^o$

$$V = \frac{9 \times 10^9 \times 16 \times 10^{-9} \times \cos 0°}{(0.6)^2} = 400 \text{ V}$$

24. (3)

$$\eta = \frac{\text{Stress}}{\text{Strain rate}} = \frac{F/A}{v/\ell} = \frac{F\ell}{vA}$$

$$\frac{\left[\text{MLT}^{-2}\text{L}\right]}{\left[\text{LT}^{-1}\text{L}^2\right]} = \left[\text{ML}^{-1}\text{T}^{-1}\right]$$

25. (1)

Ionization energy is given by

$E_i = E_\infty - E_n$

$$= 0 - \left(13.6\frac{Z^2}{n^2}\right)$$

$$\boxed{E_i = 13.6\frac{Z^2}{n^2}}$$

For hydrogen atom, required energy to move electron from second orbit:

$$E_i = 13.6\frac{(1)^2}{(2)^2} = \boxed{3.4 \text{ eV}}$$

26. (1)

Frequency of A = 516 Hz

Frequency of B can be 511 Hz or 521 Hz

When tension increases its frequency increases, so difference with A can increase or decrease, since it increases, then its original frequency should be 521 Hz.

27. (4)

By colour coding

Red	Violet	Yellow	Gold
2	7	4	5

28. (4)

$\mu = \tan i_b$ $1 < \mu < \infty$

$\tan^{-1}(1) < \tan i_b < \tan^{-1}(\infty)$

$45° < i_b < 90°$

29. (1)

$$K = \frac{C}{C_0} = \frac{144}{12} = 12 \qquad K = \frac{\varepsilon}{\varepsilon_0}$$

$\therefore \varepsilon = \varepsilon_0 \times K = 8.85 \times 10^{-12} \times 12$

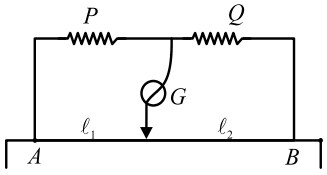
$= 1.06 \times 10^{-10}$ C^2 N^{-1} m^{-2}

30. (3)

$\vec{\tau} = \vec{r} \times \vec{F} = \left(3\hat{j}\right) \times \left(4\hat{K}\right) = 12\hat{i}$ Nm

31. (1)

$\frac{P}{15} = \frac{2}{3}$



P = 10Ω

Now resistance

$\frac{R_1}{R_2} = \frac{\ell_1}{\ell_2}$ $\qquad$ $\frac{10}{1} = \frac{1.5}{\ell_2}$

$\ell_2 = \frac{1.5}{10} = 0.15\text{m}$

32. (4)

For transistor action emitter is forward biased and collector is reverse biased.

33. (2)

The electromagnetic wave, half of the energy is provided by electric field and half by magnetic field.

34. (3)

Mobility $\mu = \frac{V_d}{E}$

$E = \frac{V_d}{\mu} = \frac{7.5 \times 10^{-4}}{3 \times 10^6} = 2.5 \times 10^{-10}$ V/m

35. (3)

$E = \frac{1}{4\pi\varepsilon_0}\frac{Q}{r^2} = \frac{9 \times 10^9 \times 6.4 \times 10^{-9}}{(0.3)^2} = 640$ N/C

36. (1)

Answer should be reported to least number of decimal places so answer should be 9.98 m.

37. (3)

$\beta = \frac{\lambda D}{d}$

$\beta' = \frac{\lambda \times (D/2)}{2d} = \frac{\lambda D}{4d} = \frac{\beta}{4}$

38. (4)

In free expansion no work is done, the temperature will remain unchanged. The internal energy remains constant. But pressure will decrease on doubling volume.

39. (3)

$E = mc^2$

$m = \frac{E}{c^2}$

So, mass decay per second,

$\frac{dm}{dt} = \frac{1}{c^2}\frac{dE}{dt}$

$= \frac{1}{c^2}$ (Power in watt)

$= \frac{1}{c^2} \times 1000 \times 10^3$

$\frac{dm}{dt} = \frac{1}{\left(3 \times 10^8\right)^2} \times 10^6$

$\boxed{\frac{dm}{dt} = \frac{1}{9} \times 10^{-10}}$

Mass decay per hour = $\frac{dm}{dt} \times 60 \times 60$

$\frac{1}{9} \times 10^{-10} \times 60 \times 60$

$= \frac{3600}{9} \times 10^{-10}$ kg

$= 400 \times 10^{-10} \times 1000$ g

$= \boxed{40 \text{ microgram}}$

40. (3)

Force of surface tension acting upwards will balance weight of waster in tube.

$F_s = 2\pi r T \cos\theta = mg$

$m \propto r$

$\frac{m_2}{m_1} = \frac{r_2}{r_1} = 2$ $\qquad$ $m_2 = 2 \times 6 = 12g$

41. (2)

$\text{Least count} = \frac{\text{Pitch}}{\text{No. of Divisionon circular sclae}}$

Pitch = Least count × No. of division on circular scale

42. (1)

$Y = \overline{\bar{A}.\bar{B}} = A + B$ $\qquad$ (it is OR gate.)

43. (2)

For diatomic gas degree of freedom is 5.

Total average thermal energy per molecule

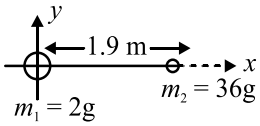
= Degree of freedom × $\frac{1}{2}k_BT$

$k_{av} = 5 \times \frac{1}{2}k_BT = \frac{5}{2}k_BT$

44. (4)

For insulators and semiconductors temperature coefficient of resistance is negative, it is positive for metals.

45. (2)



$$X_{cm} = \frac{2\times 0 + 36\times 1.9}{2+36} = \frac{68.4}{38} = 1.8 m$$

46. (3)

Fact based

47. (1)

Fact based

48. (2)

Fact based

49. (2)

Fact based

50. (1)

Fact based

SECTION – II (CHEMISTRY)

51. (2)

{III → 'Cl' has highest EA value and I → 'F' has 2nd highest EA

II → 'N' has –ve value of EA}

52. (4)

$CH_3CH(CH_3)CH_2Br$

53. (4)

Given mass = 360 g,

Molar mass of $C_6H_{12}O_6$ = 180g/mol

So, number of moles = 2.

So, Number of molecules of $C_6H_{12}O_6$ = 2 N_A

One molecule of $C_6H_{12}O_6$ has 24 atoms. So, Total number of atoms = 48 N_A

54. (1)

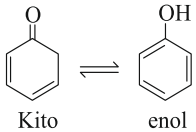
$\Delta T_f = K_f \times m$

55. (2)

$[Mn(H_2O)_4Cl_2](NO_2)$

56. (2)

Due to maximum conjugation, enol form will be most stable in (II).



Non-aromatic compound is concerted to Aromatic compound.

57. (1)

Water gas is produced by passing steam through a red hot coke bed;

58. (3)

$Cu^{2+}(aq) + 2e^- \rightleftharpoons Cu(s)$;

4 F = 4 mole of electrons;

4 mole of electrons = 2 mole of Cu(s);

1 mole of Cu(s) = 2 x 63.5 g = 127

59. (3)

In Wolff-Kishner reduction, ketone undergo reduction to form alkane.

60. (2)

The more the negative value of SRP, the more is its reducing power. Therefore, Ni < Zn < Mg < Ca;

61. (3)

Pseudo chemical reactions are those reactions, which seem to be of high order but actually they are of first order, because one of the reactants is present in excess.

62. (2)

Secondary alcohol undergoes oxidation to form ketone.

63. (4)

Diamond is bad conductor of electricity and Graphite is good conductor of electricity.

64. (1)

Ester will be formed in this reaction.

65. (4)

Catalysts are those substance which increase the rate of reaction by alters activation energy without taking part in chemical reaction.

66. (1)

$d_{x^2-y^2}, d_{z^2}$

67. **(3)**

As Neon is an inert gas, on addition of the inert gas at constant volume, equilibrium will not shift in any direction.

68. **(3)**

Gypsum contains a lower percentage of calcium than Plaster of Paris

69. **(2)**

For zero order, $t_{1/2} = \frac{[A]_0}{2k}$

$t_{1/2} \propto [A]_0$.

70. **(4)**

3-hydroxybutanoic acid and 3-hydroxypentanoic acid are the monomers of PHBV**.**

71. **(2)**

Dihydrogen of high purity (> 99.95%) is obtained by the electrolysis of warm aq. $Ba(OH)_2$ using Ni electrodes ;

72. **(3)**

$X \rightarrow B_2O_3$

$Y \rightarrow Cr(BO_2)_3$

73. **(1)**

Adipic acid and Hexamethylenediamine are monomers of Nylon - 6,6

74. **(1)**

In Frenkel Defects, ions are only displaced from normal lattice positions and are present in some interstitial voids and therefore there is no change in the density of crystal lattice;

75. **(1)**

Reaction will be spontaneous at temp, $T > \frac{\Delta H}{\Delta S}$

$$T > \frac{30 \times 10^3 \text{ KJ mol}^{-1}}{80 \text{ KJ mol}^{-1}}$$

$$\boxed{T > 365.8 \text{ K}}$$

76. **(3)**

Let r_x be rate of diffusion of X = 2a

Rate (r_y) of diffusion of Y = 3a

Using, $\frac{r_x}{r_y} = \sqrt{\frac{D_y}{D_x}}$

$\frac{D_y}{D_x} = \left(\frac{2}{3}\right)^2 = \frac{4}{9}$ or $D_x : D_y = 9:4$

77. **(1)**

On adding equation (i), (ii) and (iii) given in the question, we get: Pure solvent + Pure solute = Solution; $\Delta H_1 + \Delta H_2 + \Delta H_3 = \Delta_{Sol}H$;

78. **(2)**

2-pentene undergoes ozonolysis to form CH_3CH_2CHO and CH_3CHO

79. **(3)**

80. **(4)**

The reaction with NaOH + I_2 generally used to form an iodoform. Only 2-pentanone and Ethyl alcohol will give iodoform test.

81. **(1)**

82. **(2)**

In roasting of sulphide before reduction, carbon and hydrogen are not suitable reducing agents, $\Delta_f G^\circ$ is negative for roasting of ore; Hence, roasting of sulphide ore is thermodynamically feasible

83. **(1)**

Valine is the first amino acid, serine is second and threonine is third amino acid.

84. **(2)**

$P_T = \chi_A (P^o_A - P^o_B) + P^o_B$

85. **(1)**

This reaction follows Markovnikov's rule.

86. **(4)**

87. **(4)**

According to Boyle's law, Pressure is inversely proportional to volume.

So, $P_1 . V_1 = P_2 . V_2$

88. **(1)**

Lyophilic sols are the protective sols

89. **(3)**

Oxidation number of H is +1 and oxidation number of O is -2.

90. **(1)**

$$CH_3CH=CHCHO \xrightarrow{NaBH_4} \underset{(X)}{CH_3CH=CHCH_2OH}$$

$$\xrightarrow[ZnCl_2]{HCl} \underset{(Y)}{CH_3CH=CHCH_2Cl} \xrightarrow{KCN/H^\oplus}$$

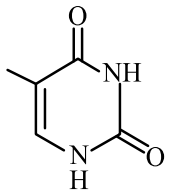
$$\underset{(Z)}{CH_3CH=CHCH_2COOH}$$

91. (3)

order of reaction = 1+2 = 3 general formula is; Unit of K= $[\text{mol L}^{-1}]^{(1-n)}/\text{s}$

92. (1)

Thymine is a pyrimidine nucleobase. Its structure will be



93. (3)

$$2CrO_4^{2-} + 2H^+ \rightleftharpoons Cr_2O_7^{2-} + H_2O$$
(yellow) (orange)

94. (2)

XeO_4 has sp^3 hybridisation.

95. (3)

$NaNH_2$ is a strong base which abstract hydrogen from 1-pentyne to form salt, but it does not form salt with 2-pentyne.

96. (1)

Follow the IUPAC rule, give numbering according to the lowest locant rule.

97. (4)

Polluted water has BOD value > 10 ppm; so this statement is correct

98. (3)

Any quantity, in which prefix is molar or specific, that is, molar volume, specific heat, specific heat capacity etc. are intensive properties.
Heat capacity is an extensive property.

99. (1)

$K_c = [Ni(CO)_4] / [CO]^4$, As for solids active mass is taken as 1.

100. (2)

Marshall acid's formula is $H_2S_2O_8$.

SECTION – III (BOTANY)

101. (1)

The hard outer layer of pollen grains is exine which is a discontinuous layer because of the presence of prominent apertures called germ pores. It is made up of sporopollenin which is one of the most resistant organic material known.
The vegetative cell is bigger, has abundant food resource and a larger irregularly shaped nucleus.

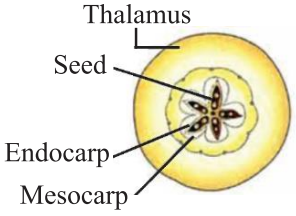
102. (3)

The megasporangium i.e, ovule is a small structure attached to placenta by means of a stalk called funicle. The body of ovule fuses with funicle in the region called hilum.

103. (2)

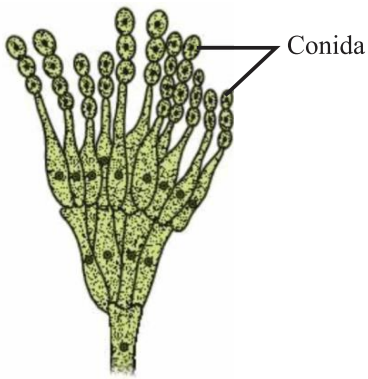
Xenogamy is cross pollination in which pollen grains are transferred from anther to stigma of a different plant. This is only type of pollination which bring genetically different types of pollen grains.

104. (3)



The given diagram showing false fruit of apple. In this, the thalamus also contributes to fruit formation.

105. (1)



Penicillium is a fungi in which common asexual reproductive spores are conidia.
It belongs to ascomycetes. Conidia are produced exogenously on special mycelium called conidiophores.

106. (2)

In a typical test cross an organism showing a dominant phenotype and whose genotype is to be determined is crossed with a recessive parent instead of self-crossing. The progenies of such cross can easily be analysed to predict the genotype of test organism.

107. (4)

In incomplete dominance, genotypic and phenotypic ratios are same. It can be seen in inheritance of flower colour in dog flower (snapdragon) both ratios comes out to be 1 : 2 : 1.

108. (1)

Starch synthesis is pea plants is controlled by a single gene having alleles (B & b). BB homozygotes produces large starch grains while bb homozygotes have lesser efficiency, produce small starch grains. After maturation of seeds, BB seeds are round and bb seeds are wrinkled. B seems to be dominant allele. But grains produced are of intermediate size in Bb seeds, it clearly shows both alleles are showing its character, hence, they are exhibiting incomplete dominance.

109. (1)

Human skin colour is controlled by genes A, B, C. Multiple genes have similar effect on a single trait called polygenic inheritance.

Pleiotropy is expression of multiple traits by a single gene.

110. (2)

The correct sequence of taxonomic categories showing hierarchial arrangement in ascending order.

Kingdom
↑
Phylum/Division
↑
Class
↑
Order
↑
Family
↑
Genus
↑
Species

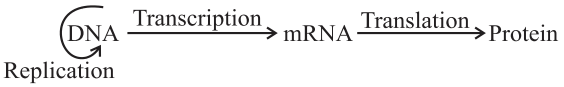
111. (1)

In a polynucleotide chain, two nucleotides are linked through 3'-5' phosphodiester linkage to form a dinucleotide.

Phosphate group is linked to OH of 5'C of a nucleoside through phosphoester linkage.

Backbone of a polynucleotide chain is form by sugar and phosphate and bases projects inside.

112. (2)



This flow of genetic information from DNA to mRNA to protein is central dogma and proposed by Francis Crick.

113. (1)

In transcription only one strand of DNA is being copied into mRNA.

Both the strands are not copied because it would produce a double stranded RNA due to principle of complementarity. A dsRNA can't undergo translation hence transcription exercise would become a futile one.

114. (4)

DNA polymerase	– Okazaki fragment
RNA polymerase III	– snRNA
RNA polymerase I	– rRNA
Splicing	– mRNA processing
Rho factor	– RNA polymerase

115. (2)

The sequence of mRNA is– 5'AUG GAC CUG AUA UUU UGA3'

The sequence of DNA is– 5'TAC CTG GAC TAT AAA ACT3'

Since, a purine always comes opposite to pyrimidine.

G ≡ C

A = T/U

uracil is present in RNA and thymine is present in DNA.

116. (1)

Hisardale a new breed of sheep developed in Punjab is produced by cross-breeding method by crossing Bikaneri ewes and Marino Rams.

117. (3)

In mung bean, resistant to yellow mosaic virus and powdery mildew induced by mutations. This comes under mutation breeding.

118. (1)

The given diagram showing adenovirus. It cause respiratory infections.

119. (4)

Clostridium butylicum (bacterium) produces butyric acid. Acetic acid is produced by bacterium *Acetobacter aceti*.

120. (3)

Birth rate can be calculated as:

$\frac{12}{40}$ = 0.3 offspring per lotus per year.

121. (2)

In nature, a given habitat has enough resources to support a maximum possible number beyond which there is no further growth possible. This is nature's carrying capacity (K) for that species in that habitat. It can be represented by

$$\frac{dN}{dt} = rN\left(\frac{K-N}{K}\right)$$

It is logistic population growth.

122. (4)

An overwhelming majority of animals and nearly all plants cannot maintain a constant internal environment. Their body temperature changes with the ambient temperature. They are called conformers.

123. (4)

Primary succession occurs in areas like newly cooled lava, reservoir, bare rock, newly created bond. The establishment of a new biotic community is generally slow.

124. (1)

Primary succession occurs in following stages:

Phytoplankton stage → Submerged plant stage → Submerged free floating plant stage → Reed swamp stage → Marsh meadow stage → Scrub stage → Forest.

125. (3)

The IUCN Red list in 2004 documented the extinction of 359 invertebrate species.

126. (2)

In India, Air prevention and control of pollution act came into force in 1981 but was amended in 1987 to included noise as an air pollutant.

127. (3)

Slime moulds under suitable conditions form an aggregation called plasmodium which may grow and speed over several feet. Under unfavourable conditions, they form fruiting bodies bearing spores at their tips.

Flagellated protozoans are either free-living or parasitic euglenoids have a protein rich layer called pellicle which makes their body flexible.

128. (1)

Meiosis is a mechanism by which conservation of specific chromosome number of each species is achieved across generations in sexually reproducing organisms. It increases the genetic variability in population of organisms from one generation to the next.

129. (1)

Selaginella is genus of vascular plants pteridophytes. It belongs to lycopsida having heterospores.

130. (4)

Cauliflower scientific name is *Brassica oleracea* which belongs to brassicaceae family or mustard family. Its floral formula is:

$\oplus \female\!\!\male\ k_{2+2}\ C_4\ A_{2+4}\ \underline{G}_{(2)}$

131. (4)

Buds protect themselves by–

(1) "Bud scales– Buds are covered by dry scale outer leaves called bud scales e.g. Ficus
(2) Hair– Dense mass of hair is present around bud.
(3) Folded leaves– Buds leaves are very compact and are folded to protect themselves.
(4) Resin secretions also help them to protect themselves.

132. (2)

Aestivation	–	Examples
Valvate	–	*Calotropis*
Imbricate	–	*Cassia*, Gulmohar
Twisted	–	Cotton
Vexillary	–	Bean, pea

133. (4)

Copper is a trace element called micronutrient needed in smaller amounts while P, Mg, Ca, S, C, H, O, N etc. all are macronutrients needed in large amounts.

134. (2)

At incipient plasmolysis, water potential is equal to solute potential.

$\psi_w = \psi_s$

i.e. plasmolysis just takes place.

135. (1)

Cyclic photophosphorylation is only concerned with ATP production. It takes place only in photosystem I. The first stable product formed in C_4 plants is oxalo acetic acid. It is a 4-C compound.

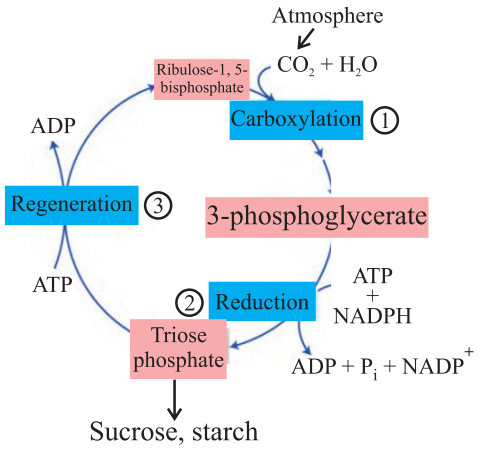
136. (1)

NADPH is generated through Photosystem I.

137. (2)

The given Calvin cycle proceeds in three stages.

1. Carboxylation– in this CO_2 combines with ribulose 1, 5-bisphosphate.
2. Reduction– Carbohydrate is formed at expense of photochemically made ATP and NADPH.
3. Regeneration– during this CO_2 acceptor ribulose 1-5, bisphosphate is formed again so that cycle continuous.



138. (1)

In glycolysis, NADH + H^+ is formed from NAD^+ when 3-phosphoglyceraldehyde (PGAL) is converted into 1-3,-bisphosphoglycerate (BPGA). Two redox-equivalents are removed (in the form of 2-H atoms) from PGAL and transferred to a molecule of NAD^+.

139. (2)

One molecule of $FADH_2$ produce two molecules of ATP so, 3 $FADH_2$ will produce $3 \times 2 = 6$ ATP molecule.

140. (4)

Gibberellins causes fruits like apples to elongate and improve its shape. Auxins promote and initiate cell division, that can induce parthenocarpy in fruits eg. tomatoes. Auxins promote flowering in pineapple. They are responsible for apical dominance.

141. (2)

Cytokinin are phytohormones and they have physiological effects like they promote cell division cell enlargement, cell differentiation and growth. If they are not present in culture medium, all these processes will become slow.

142. (4)

NAA (Naphthalene acetic acid) and 2, 4-D are synthetic Auxins, not isolated from plants.

143. (3)

Size of bacteria is typically 1-2 μm PPLO is (Pleuro pneumonia like organisms) are smaller than bacteria whose size is about 0.1 μm. Viruses are smaller in size (0.02 – 0.2 μm). Viroids are smaller then viruses made up of only genetic material.

144. (1)

Nucleolus is not a membrane bound structure. It is a site of active ribosomal RNA synthesis.

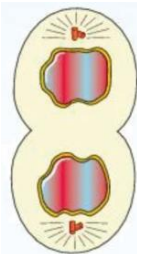
145. (2)

Golgi body is associated with secretory activity of cell. It helps in transporting protein within or outside the cell.

146. (4)

Nuclear envelope, ER, Golgi body all reform at Telophase stage.

Nuclear envelope develops around the chromosome clusters at each pole forming 2 daughter nuclei in Telophase stage.



Telophase

147. (3)

Mosses are small non-vascular flowerless plants in division bryophyte. They need water for fertilization. They are called amphibians of plant kingdom because they live in soil but need water for fertilisation.

148. (1)

Desynapsis i.e. separation of homologous chromosomes begins due to dissolution of synaptinemal complex. This separation is not completed as it remains attached at one or more X-shaped points called chiasmata where crossing over has occurred. This happens in Diplotene stage of prophase I of meiosis I.

149. (3)

Diffusion pressure deficit (DPD) is otherwise known as suction pressure (SP). Water moves from a region or place of low suction pressure to a place of higher suction pressure.

150. (3)

Molybdenum (Mo) is a component of enzyme nitrogenase.

Mg^{2+} is an activator for both RuBP carboxylase oxygenase and phosphoenol pyruvate carboxylase enzymes.

Zn^{2+} is an activator of enzyme alcohol dehydrogenase.

Sulphurs (SO_4^{2-}) is constituent of ferredoxin.

SECTION – IV (ZOOLOGY)

151. (2)

Second largest phylum of animal kingdom is mollusca and first largest phylum is Arthropoda.

152. (3)

Mantle is the characteristic feature of mollusca.

153. (1)

Chaetopleuro = Chiton
Aplysia = Sea-hare
Unio = Fresh water mussel
Arehiteuthis = Giant squid

154. (1)

Water vascular system is found in phylum Echinodermata that help in locomotion. Capture and transfer of food and respiration, Hemichordates have notochord like structure but not notochord besides this stomochord is found in hemichordates.

155. (3)

Vector insect are *Anopheles*, *Cules* and *Aedes* *Laccifer lacca* is a lac producing insect.

156. (2)

The development of *Periplanata americana* is paurometabolous, paurometabolous mean metamorphosis that involve nymphal stage. The embryo develop into a mature individual without involving a larval stage.

157. (4)

Plasma cells have cart-wheel like nucleus Adipocytes are fat cells

158. (4)

Epimysium is the covering of muscle.
Heart covering = Pericardium
Bone cells covering = Periosteum
Cartilage cells covering = Perichondrium

159. (4)

The deoxyribose sugar and phosphate component occur in equal proportion.

160. (2)

Arachidonic acid has 20 carbon including carboxyl carbon and plamitic acid has 16 carbons including carboxyl carbon.

161. (4)

Temperature, pH and substrate concentration affect enzyme activity.

162. (2)

Hydroxymethyl is the side chain of serine.

163. (4)

A molecular of ATP bears maximum resemblance to RNA nucleotide.

164. (1)

Co-factor cytochrome oxidase is iron.

165. (3)

Oesophagus has both voluntary and involuntary muscle fibre. Anterior 1/3 voluntary and 2/3 voluntary.

166. (2)

Gastic gland are located in mucosa of stomach.

167. (3)

Proteins pepsin proteoses + peptones.

168. (4)

Vomiting is the ejection of stomach content through mouth and this reflex action is controlled by vomit centre in medulla.

169. (2)

Lungs are enclosed by pleural membrane cells are enclosed by plasma membranes.

170. (1)
Lubrication of the pleural membrane is the function of pleural fluid.

171. (2)
In human, the thoracic chamber is formed dorsally by vertebral column and ventrally by the sternum.

172. (4)
ABO blood grouping was discovered by Karl Landsteiner. ABO blood grouping is based on surface antigen present on RBC.

173. (4)
In myogenic heart impulse for heart beat arise in heart muscle and in neurogenic heart impulse for heart beat arises from nerves.

174. (3)
Serum does not contain clotting factor.

175. (4)
Cortical portion of kidney projecting between the medullary pyramids in human kidney are called column of bertini.

176. (1)
Dislocation is displacement of articular surface of joint.

177. (3)
Joint between carpel and metacarpal of thumb is saddle joint. Shoulder and hip joint are ball and socket joint. Elbow and knee joint are hinge joint and gliding joints are found in tarsals and carpals.

178. (3)
GABA is a inhibitory neurotransmitter.

179. (3)
In human being a typical nerve cell is multipolar.

180. (2)
Cholecystokinin is released from duodenum.

181. (3)
Iodothyronine are thyroid hormone.

182. (1)
The ovarian stroma is divided into two subzone outer cortex and inner medulla.

183. (1)
Acrosome is a part of sperm head.

184. (2)
The blastomere in blastocyst are arranged in a outer layer of trophoblast.

185. (3)
Most of the organ system are formed at the end of first trimester.

186. (2)
Gonorrhoea is a disease caused by bacteria.

187. (1)
Thorns of *bougainvillea* and tendrils of *cucurbita* are example of homologous organs.

188. (2)
Ontogeny is recapitulation of phylogeny is given by Ernst haeckel.

189. (1)
Lichens are symbiotic association of algae and fungus.

190. (3)
Coelacanth are thought to be evolved into first amphibians.

191. (1)
Homo sapiens is the first animal on earth that has collected evidences of his origin and evolution.

192. (1)
'Java man' is known as *Homo erectus.*

193. (2)
Diptheria is caused by bacteria.

194. (1)
Malignant tumor shows the property of metastasis.

195. (4)
HIV has a protein coat and a genetic material which is ssRNA.

196. (1)
Hilsa is edible marine fish.

197. (4)
Biotechnology reveals use of microorganism in industrial process, rDNA and engineered bacteria for production of antibiotics and antibodies.

198. (2)

Bacteria protect themselves from virus attack by producing endonuclease.

199. (4)

Normally *E. coli* cells does not possess resistance to antibiotics.

200. (1)

Palindromic sequence are

5'-GAATTC-3'

3'-CTTAAG-5'