Yakeen NEET 2.0 (2026)

Practice Test - 01

DURATION : 180 Minutes | **DATE : 08/06/2025** | **M. MARKS : 720**

Topics Covered

Physics:	Basic Maths & Calculus, (Mathematical Tools), Trigonometry, Algebra, Binomial, AP, GP, Graphs, Logarithms
Chemistry:	Some Basic Concept of Chemistry: Dalton's Atomic Theory, Types of partical and its calculation, Molar Mass, AMU, Mole, Mole concept, Average molar Mass, VD, Mass % Age, Average Molar Mass, Stoichiometry, Limiting reagent, % age yield, Impure sample, Laws of chemical combination, EF & EF Concentration Terms, Concentration Term Continuous, Equivalents Mass, Normality
Biology:	**(Botany):** Cell-The Unit of Life, What is a Cell? Discovery of the Cell, Microscopy, Cell Theory, Overview of Cell, Types of cell, Structure Prokaryotic cell, Prokaryotic cells, Eukaryotic cells Topics: Cell Membrane, Cell Wall, Endomembrane System **(Zoology):** Structural Organization in Animals, Tissues, Animal Tissues, Epithelium Tissue, Cell Junctions, Connective Tissue. (except blood and lymph)

General Instructions:

1. Immediately fill in the particulars on this page of the test booklet.
2. The test is of **180 minutes** duration and the Test Booklet contains **180** multiple choice questions (four options with a single correct answer) from **Physics, Chemistry and Biology (Botany and Zoology)**. **45** questions in each subject
3. The test booklet consists of **180** questions. The maximum marks are **720**.
4. There is only **one correct** response for each question.
5. Each correct answer will give 4 marks while 1 Mark will be deducted for a wrong MCQ response.
6. 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.
7. Use of white fluid for correction is **not permissible** on the **Answer Sheet**.
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.

Answer Key

Q1	(3)
Q2	(4)
Q3	(2)
Q4	(2)
Q5	(2)
Q6	(2)
Q7	(1)
Q8	(2)
Q9	(3)
Q10	(3)
Q11	(2)
Q12	(3)
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Q16	(3)
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Q171 (1)

Q172 (4)

Q173 (3)

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Q175 (3)

Q176 (3)

Q177 (2)

Q178 (3)

Q179 (3)

Q180 (3)

Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Text Solution:

$(1 + x)^3 = 1 + 3x + 3x^2 + x^3$

$x << 1$, neglecting terms containing n^2 and n^3

$= 1 + 3x$

Q2 Text Solution:

$S_\infty = \frac{a}{1-r} = \frac{1}{1-1/4} = \frac{4}{3}$

Video Solution:

Q3 Text Solution:

Equation of parabola after simplify the equation

Video Solution:

Q4 Text Solution:

If the number of terms in the A.P. are n, then 10^{th} term from the end will be $(n - 9)^{th}$ term from starting.

$\therefore \quad 5 + (n - 10) \times 3 = 95 \quad \Rightarrow \quad n = 40.$

Q5 Text Solution:

$x^2 + 7x + 12 = 0$

$(x + 3)(x + 4) = 0$

$x = -3, -4$

Video Solution:

Q6 Text Solution:

$\log_{10}{}^{64} = \log_{10} 2^6$

$= 6 \log_{10} 2$

$= 6 \times 0.3 = 1.8$

Q7 Text Solution:

$\log_e ab = \log_e a + \log_e b$

Q8 Text Solution:

$\log_a x - \log_a y = \log_a \frac{x}{y}$

Q9 Text Solution:

$2x^2 + 3x - 2 = 0$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ for $ax^2 + bx + c = 0$

$= \frac{-3 \pm \sqrt{3^2 - 4(2)(-2)}}{4}$

$= \frac{-3 \pm \sqrt{9+16}}{4} = \frac{-3 \pm 5}{4}$

$= \frac{2}{4}, \frac{-8}{4}$

$= \left(\frac{1}{2}, -2\right)$

Q10 Text Solution:

$\cos A = \frac{7}{25} = \frac{\text{Base}}{\text{Hypotenuse}}$

then, P = 24

So, $\tan A + \cot A = \frac{24}{7} + \frac{7}{24}$

$= \frac{625}{168}$

Q11 Text Solution:

Because $a \sin + b \cos \theta \leq \sqrt{a^2 + b^2}$

Greatest value is $\sqrt{a^2 + b^2}$

then greatest value of $-5 \sin \theta + 12 \cos \theta$ is

$= \sqrt{25 + 144} = \sqrt{169} = 13$

Q12 Text Solution:

At x-axis, y = 0 so $x^2 + 2 - 3x - 0 \Rightarrow x = 1$ and 2 therefore curve intersects the x-axis at (1, 0) and (2, 0).

Q13 Text Solution:

Formula Based

Q14 Text Solution:

At point P tangent is parallel to x – axis and hence slope is zero.

Video Solution:

Q15 Text Solution:

$\sin(750^\circ) = \sin(720^\circ + 30^\circ)$

$= \sin 30^\circ = \frac{1}{2}$

Q16 Text Solution:

$H^2 = P^2 + B^2$

$H^2 = 9 + 16$

$H = 5m$

Video Solution:

Q17 Text Solution:

sin (A – B) = sin$A$ cos$B$ – cos$A$ sin$B$

Q18 Text Solution:

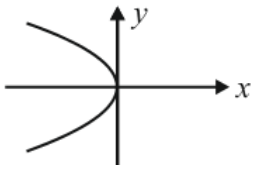
$y = \log x^5 + \log x^2$

$= 5 \log x + 2 \log x$

= 7 log x

Q19 Text Solution:

For $x = -5y^2$, correct graph is



Q20 Text Solution:

$\sin A = \frac{\text{Opposite side}}{\text{Hypotenuse side}} = \frac{3}{5}$

From Pythagoras theorem,

(Hypotenuse)^2 = (Opposite side)^2 + (Adjacent side)^2

$5^2 = 3^2$ + (Adjacent side)^2

(Adjacent side)^2 = $5^2 - 3^2$

Adjacent side = $\sqrt{16} = 4$

$\tan A = \frac{\text{Opposite side}}{\text{Adjacent side}} = \frac{3}{4}$

Q21 Text Solution:

$a_1 = 1$, $a_2 = 4$

So, common difference, $d = a_2 - a_1 = 4 - 1 = 3$

To find the 10th term of AP, use the formula:

$a_n = a + (n - 1)\, d$

$a_{10} = 1 + (10 - 1) \times 3$

$= 1 + 27$

$= 28$

Hence, the 10th term is 28.

Q22 Text Solution:

Use property, sin(A + B) = sin$A$ cos$B$ + cos$A$ sin$B$

sin30° cos15° + cos30°sin15° = sin45° $= \frac{1}{\sqrt{2}}$

Q23 Text Solution:

$\cos 2\theta = \cos^2\theta - \sin^2\theta$

$\cos 2\theta = 2\cos^2\theta - 1$

$\Rightarrow \cos^2\theta = \frac{1 + \cos 2\theta}{2}$

Q24 Text Solution:

$2x + 3y = 5$

$\Rightarrow y = \frac{-2x}{3} + \frac{5}{3}$

$\therefore\ m = -\frac{2}{3}$

Q25 Text Solution:

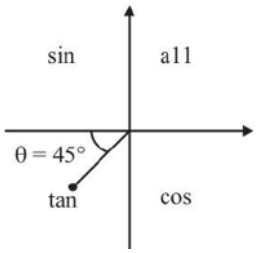
$\sqrt{0.999} = (1 - 0.001)^{\frac{1}{2}}$

$= 1 - \left(\frac{1}{2} \times 0.001\right) \quad \left[(1+x)^n \approx 1 + nx\right]$

= 0.9995

Q26 Text Solution:

$\sin\ \theta = -\frac{1}{\sqrt{2}} \&\ \tan\ \theta = 1$



$\theta \rightarrow$ is in 3^{rd} quadrant.

Q27 Text Solution:

$y = \frac{\theta}{\theta} = 1$ (where θ is small then $\tan\theta = \theta$)

Video Solution:

Q28 Text Solution:

$\log_4 y^2 = 4$

$y = 4^2 = 16$

Q29 Text Solution:

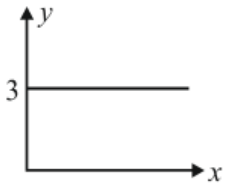
$y = 3$

$y = 3 + 0x$ ...(1)

general equation of straight line

$y = mx + c$ ...(2)

On comparing, $m = 0$, $c = 3$



Q30 Text Solution:

We know, $\tan\left(x - y\right) = \frac{(\tan x - \tan y)}{(1 + \tan x \tan y)}$

$\tan\left(45^\circ - 30^\circ\right) = \frac{(\tan 45^\circ - \tan 30^\circ)}{(1 + \tan 45^\circ \tan 30^\circ)}$

$\tan 15^\circ = \frac{\left(1 - \frac{1}{\sqrt{3}}\right)}{\left(1 + \frac{1}{\sqrt{3}}\right)} = \frac{(\sqrt{3} - 1)}{(\sqrt{3} + 1)} = 2 - \sqrt{3}$

Q31 Text Solution:

Where θ is small then $\cos\ \theta = 1$

Video Solution:

Q32 Text Solution:

$y = \frac{\ln\ x + \ln\ x^2 + \ln\ x^3 + \ln\ x^4}{10}$

$= \frac{\ln\ x + 2\ \ln\ x + 3\ \ln\ x + 4\ \ln\ x}{10}$

$= \ln\ x$

Q33 Text Solution:

Here, $a = 1$, $r = \frac{1}{2}$

So, $S_\infty = \frac{a}{1-r} = \frac{1}{1 - \frac{1}{2}} = 2$

Q34 Text Solution:

Here $a = 4$, $d = 4$, $n = 16$

So, sum = $\frac{n}{2}$ [First term + last term]

= $\frac{16}{2}\left[4 + 64\right]$

= 8 (68)

= 544

Q35 Text Solution:

$(5.03)^3 = (5 + 0.03)^3$

$= \left(5\left(1+\frac{0.03}{5}\right)\right)^3$

$= (5)^3\left(1+\frac{3\times0.03}{5}\right)$ = 127.25

Q36 Text Solution:

Sum of natural numbers

$S = \frac{(n)(n+1)}{2}$

Here $n = 50$

$S = \frac{50\times51}{2} = 1275$

Q37 Text Solution:

Hooke's law for a spring is

F= –kx,

which is a straight line relationship through the origin with negative slope. Specifically, when x is positive (stretch), F is negative (restoring force), and vice versa. Hence, on an F versus x graph, the line passes through the origin and slopes downward from left to right.

Q38 Text Solution:

$KE = \frac{p^2}{2m}$,

this is a parabola is p. Plotting KE(vertical axis) vs. p (horizontal axis) gives an upward opening parabola with its vertex at the origin. Thus, the correct graph is the one shaped like $y = x^2$.

Q39 Text Solution:

Comparing with $y = mx + c$

$m = \frac{1}{2}, c = \frac{3}{2}$

⇒positive slope and positive y intercept.

Q40 Text Solution:

Given equation represents a parabola having symmetry about –y-axis and vertex at origin.

Q41 Text Solution:

$\cos\ A = \frac{\sqrt{3}}{2}$

$\Rightarrow A = 30^\circ$

$\tan\ 3A = \tan\ 3\left(30^\circ\right)$

$\tan\ 90^\circ = \infty$

Q42 Text Solution:

sin 2θ = 1 (Maximum Value)

$2\theta = 90°$

$\theta = 45°$

Q43 Text Solution:

$P = \frac{h}{\lambda}$

$\boxed{P \propto \frac{1}{\lambda}}$

Graph will be hypberbola.

Q44 Text Solution:

$(1001)^{1/3} = (1000+1)^{\frac{1}{3}}$

$= \left[1000\left(1+\frac{1}{1000}\right)\right]^{\frac{1}{3}}$

$= 10\left(1+\frac{1}{1000}\right)^{\frac{1}{3}}$

$= 10(1+0.00033)$

$= 10.0033$

Q45 Text Solution:

Slope of B is ZERO, slope of A is positive and slope of C is negative.

Video Solution:

Q46 Text Solution:

Remaining molecules

$= (0.1-0.01)\times6.022\times10^{23}$

$= 5.4\times10^{22}$

[NCERT 2024-25 Class 11th Page No. 18]

Q47 Text Solution:

Molar mass of $CHCl_3$ = 119.5

Molar mass of CH_3COCH_3 = 58

58 gm of CH_3COCH_3 produced 119.5 gm

Yield is 75% $= \frac{119.5\times75}{100} = 89.625$ gm

So, 89.625 produced by 58 gm

30 gm of chloroform is formed by

$= \frac{58}{89.625}\times30 = 19.4$ gm

Video Solution:

Q48 **Text Solution:**

$4Al(s) + 3O_2(g) \rightarrow 2Al_2O_3(s)$

Moles of Al = $\frac{4}{3} \times \text{moles of } O_2$

= $\frac{4}{3} \times \frac{1}{2} = \frac{2}{3}$

Weight of Al = $\frac{2}{3} \times 27 = 18\ g$

[New NCERT Class 11th Page No. 20]

Video Solution:

Q49 **Text Solution:**

Molecular formula of methane $= CH_4$

Empirical formula of methane $= CH_4$

Molecular formula of ethane $= C_2H_6$

Empirical formula of ethane $= CH_3$

[NCERT 2024-25 Class 11th Page No.19]

Video Solution:

Q50 **Text Solution:**

One molecule of $Ca(OH)_2$ contains 5 atoms. 1 mole $Ca(OH)_2$ contains $5 \times 6.022 \times 10^{23}$ atoms.

Video Solution:

Q51 **Text Solution:**

Law of conservation of mass states that mass can neither be created nor be destroyed only transfered from one form to another.

Video Solution:

Q52 **Text Solution:**

$\frac{N_1V_1+N_2V_2+N_3V_3}{V_{total}} = \frac{(10\times1)+(20\times1/2)+(30\times1/3)}{1000\ mL}$

$= \frac{3N}{100}$

Video Solution:

Q53 **Text Solution:**

(I) $n_{CO_2} = \frac{11}{44} = \frac{1}{4} = 0.25$

(II) $n_{CO_2} = \frac{N}{N_A} \Rightarrow \frac{N_A}{4N_A} = \frac{1}{4} = 0.25$

(III) $n_{CO_2} = \frac{V}{22.4} \Rightarrow \frac{1.12}{22.4} = \frac{1}{20} = 0.05$

Video Solution:

Q54 Text Solution:

i. $H_2O \rightarrow$ Molecular mass

$= (2 \times 1) + 16 = 18$ g $\rightarrow A$

ii. $N_2 \rightarrow$ Molecular mass

$= 2 \times 14 = 28$ g $\rightarrow$B

iii. $CH_4 \rightarrow$Molecular mass

$= 12 + (4 \times 1) = 16$ g $\rightarrow$C

iv. $SO_4 \rightarrow$Molecular mass

$= 32 + (2 \times 16) = 64$ g $\rightarrow$D

[NCERT 11th Edition 2024-25 Page No. 17]

Q55 Text Solution:

10 mole of water $= 10 \times N_A$ molecules

1 molecule of water contains $= 2 + 8 = 10$ electrons

So, $10\ N_A$ molecules contains electrons $= 100\ N_A$

[NCERT 2024-25 Class 11th Page No. 18]

Q56 Text Solution:

mass of metal = 60 g

$\therefore$ mass of oxygen = 40 g

$\rightarrow$ mass of oxygen mass of metal

$$\text{Eq. wt. of metal} = \frac{\text{wt. of metal}}{\text{wt. of oxygen}} \times 8$$

$$= \frac{8 \times 60}{40} = 12$$

Video Solution:

Q57 Text Solution:

Law of multiple proportions is valid when two same compounds contain different composition.

Video Solution:

Q58 Text Solution:

Average atomic mass of boron = $\frac{19 \times 10 + 81 \times 11}{100}$

= 10.8 u

[NCERT 2024-25 Class 11th Page No. 28]

Video Solution:

Q59 Text Solution:

One molal solution means one mole of solute is present in 1 kg solvent, no. of moles of solvent

$\frac{1000\text{g}}{18\text{g}} = \frac{1000}{18}$

Mole fraction of solute:

$$= \frac{1}{\left(1 + \frac{1000}{18}\right)} = \frac{18}{1018} = 0.018$$

Video Solution:

Q60 Text Solution:

In the reaction,

$$N_2(g) + 3H_2(g) \rightarrow 2\,NH_3(g),$$

the ratio by volume of N_2, H_2 and NH_3 is 1: 3: 2. This illustrates the law of gaseous volumes or Gay Lussac's law of combining volumes of gases.

Video Solution:

Q61 **Text Solution:**

$A_2 + B_2 \rightarrow AB_3$

Applying POAC on A atom,

moles of A atom in A_2 = moles of A atoms in AB_3

moles of A atom in A_2 = 2 moles

moles of A atoms in AB_3 = 1 moles

2 moles of A_2 = 1 mole of AB_3

$\Rightarrow$ moles of $A_2 = \frac{3}{2}$ mole = 1.5 mole

Q62 **Text Solution:**

(2)

The reaction is:

$2H_2 + O_2 \rightarrow 2H_2O$

Two volumes of hydrogen gas combine with one volume of oxygen gas to produce two volumes of water vapor, as gases obey a simple ratio of volumes.

[NCERT 11th Edition 2024-25 Page No. 15]

Q63 **Text Solution:**

- K_2SO_4 = Potassium sulfate
- $Al_2(SO_4)_3 \cdot 24H_2O$= Aluminium sulfate hydrate

It is a combination of two salts.

For K_2SO_4:

- $2K^+ + SO_4^{2-}$
- 2 potassium ions = $2 \times (+1) = +2$

Thus, n-factor = 2.

For $Al_2(SO_4)_3$:

- $2Al^{3+} + 3SO_4^{2-}$2Al3++3SO42−
- 2 aluminum ions = $2 \times (+3) = +6$2×(+3)=+6

Thus, n-factor = 6.

Total n factor = $2 + 6 = 8$

So, n-factor = 8.

$$\text{Equivalent weight} = \frac{\text{Molar mass (M)}}{\text{n-factor}}$$

Thus,

$$\text{Equivalent weight} = \frac{M}{8}$$

Video Solution:

Q64 **Text Solution:**

We shall convert all values into grams

I. 50 g Fe, mass = 50 g

II. 5 moles of N_2 = We know number of moles = $\frac{Mass\ of\ a\ substance}{Molar\ mass}$

$5 = \frac{Mass\ of\ N_2}{28}$

Mass of N_2 = 140 g

III. 0.1 g of Ag = 0.1 g

IV. 10^{23} atoms of carbon

6.022×10^{23} atoms are present in 12 g of carbon

10^{23} atom will be present in = $\frac{10^{23}}{6.022 \times 10^{23}} \times 12$ = 1.99 g

Q65 **Text Solution:**

- 22.4 L of He gas have N_A atoms of He at 1 atm and 273 K

- 1 mole of any gas occupy 22.4 L at 1 atm and 273 K.

[New NCERT Class 11th Page No. 18]

Video Solution:

Q66 Text Solution:

(3)

Correct Answer - A

$\text{Molality} = \frac{\text{Number of moles of solute}}{\text{weight of solvent (in kg)}}$

If number of moles of solute $= 1$

Weight of solvent $= 1$ kg then, molality $= 1$, i.e., one molal

For glucose $(C_6H_{12}O_6)$, molecular weight $= 180$

number of moles $= \frac{180}{180} = 1$, weight of water $= 1$ kg

Hence, molality of the solution is one.

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[New NCERT Class 11th Page No. 24]

Video Solution:

Q67 Text Solution:

(3)

$$\text{Number of moles} = \frac{V}{22400} = \frac{100}{22400} = \frac{1}{224}\text{mol}$$

$$\text{No. of molecules} = \frac{1}{224} \times N_A$$

Same for all.

[New NCERT Class 11th Page No. 05]

Video Solution:

Q68 Text Solution:

- Equivalent weight of a species can be written as the molecular weight of the species divided by the valence factor.
- Valence factor represents valence in an element, acidity in bases, basicity in acids, and total charge on cation or anion in an ionic compound

Video Solution:

Q69 Text Solution:

1 mole of $O_2\,(g)$ at STP contains Avogadro number $\left(N_A = 6.022 \times 10^{23}\ \text{mol}^{-1}\right)$ of O_2 molecules, which will occupy its molar volume, i.e, 22.4 L.

Video Solution:

Q70 Text Solution:

$C_3H_8(g) + O_2\,(g) \rightarrow CO_2(g) + H_2O(g)$

Video Solution:

Q71 Text Solution:

(3)

One molecule of methane (CH_4) contains one atom of carbon and four atom of hydrogen.

Total electrons in methane = 1 × 6 + 4 × 1 = 10

(NEW NCERT 11th Part-I Page No. 20)

Video Solution:

Q72 Text Solution:

(2)

12 × 12 + 22 × 1 + 11 × 16 = 342 u.

Video Solution:

Q73 Text Solution:

(2)

Number of atoms = $0.1 \times 3 \times 6.022 \times 10^{23}$

= 1.8066×10^{23}

Video Solution:

Q74 Text Solution:

Divide the molecular subscripts of glucose ($C_6H_{12}O_6$) by the highest common factor, 6. This yields the simplest whole-number ratio C : H : O = 1 : 2 : 1, giving the empirical formula CH_2O. The empirical formula conveys only the simplest atomic proportion, whereas the original molecular formula reflects six such units per molecule.

Video Solution:

Q75 Text Solution:

Mixtures don't follow fixed composition.

Video Solution:

Q76 Text Solution:

Number of moles of $\mathrm{H_2O} = \frac{36}{18} = 2$ moles

H has zero neutron and O has 8 neutrons.

Number of neutrons in 2 moles of

$\mathrm{H_2O} = 2 \times 8 \times \mathrm{N_A} = 16\ \mathrm{N_A}$

Video Solution:

Q77 **Text Solution:**

Law of conversation of mass states that mass can neither be created nor be destroyed in a chemical reaction.

Video Solution:

Q78 **Text Solution:**

Formula unit mass of $NaHCO_3$

= (Atomic mass of Na) + (Atomic mass of H) + (Atomic mass of C) + 3×(Atomic mass of O)

= 23 + 1 + 12 + 3×16 = 84 u.

[NCERT 2024-25 Class 11th Page No.17]

Video Solution:

Q79 **Text Solution:**

No. of atoms present in a molecules of a gaseous element is called atomicity. So, atoms present in O_2 is 2. therefore, its atomicity is 2.

1 mole = 6.022×10^{23}. So, no. of atoms in 1 mole consists of 6.022×10^{23} atoms.

Q80 **Text Solution:**

$M = \frac{N}{n-Factor} = \frac{0.02}{2} = 0.01\ Mol/L$

Moles = M × Volume

=0.01 ×0.1=0.001

No. of mole volumes = $0.001 \times 6.022 \times 10^{23} = 6.022 \times 10^{20}$

Video Solution:

Q81 **Text Solution:**

A. Ammonia – A compound made of nitrogen and hydrogen.

B. Mercuric oxide (HgO) – A compound of mercury and oxygen.

C. KCl – A compound made up of potassium and chlorine.

D. Mercury (Hg) – Not a compound, it is a pure element, specifically a metal in its liquid state at room temperature.

[NCERT 2024-25 Class 11th Page No.06]

Video Solution:

Q82 **Text Solution:**

1 atomic mass unit (amu) is approximately 1.66 × 10^{-24} grams.

[NCERT 2024-25 Class 11th Page No.17]

Q83 **Text Solution:**

(1)

Molar mass = $\frac{mass}{volume} \times 22.4 = \frac{14}{11.2} \times 22.4$

= 28 g

The gas could be N_2

(NEW NCERT 11th Part-I Page No. 18)

Q84 Text Solution:

(3)

Strength = $0.9\ \text{g}\ \text{L}^{-1}$

Molarity = $\frac{0.9}{180}$ mol/l = 0.005 M

[NCERT 2024-25 Class 11th Page No. 21]

Video Solution:

Q85 Text Solution:

In 1 mole of $CaCO_3$, we have:

- 1 mole of Ca^{2+} ions
- 1 mole of CO_3^{2-} ions, which contains 1 mole of C atoms and 3 moles of O atoms.

Thus, the total number of atoms = 1 + 1 + 3 = 5 moles of atoms.

Since 1 mole = 6.022×10^{23} entities, the total number of atoms = $5 \times 6.022 \times 10^{23}$.

Video Solution:

Q86 Text Solution:

60 g of urea contains 28 g of nitrogen

100 g of urea contains $\frac{28}{60} \times 100 = 46.66\,\%$ nitrogens.

Video Solution:

Q87 Text Solution:

A small amount of salt dissolved in water is an example of homogenous mixture or solution.

[NCERT 2024-25 Class 11th Page No.14]

Video Solution:

Q88 Text Solution:

(3)

Number of moles of glucose $= \frac{3}{180} = \frac{1}{60}$

Weight of solvent = 53 – 3 = 50 g

Molality of solution = $\frac{\frac{1}{60}}{50} \times 1000$ = 0.33 m

Video Solution:

Q89 Text Solution:

Mass (g) = N × V(L) × Eq. wt

Mass = 0.1 × 0.5 × 63

= 3.15 g

Video Solution:

Q90 Text Solution:

N^{3-} = 7 protons and 10 electrons.

Video Solution:

Q91 Text Solution:

The cytoplasm is the main arena of cellular activities in both the plant and animal cells.

[NCERT 11th Edition 2025-26 Page No. 88]

Q92 Text Solution:

Reserve material in prokaryotic cells are stored in the cytoplasm in the form of inclusion bodies. These are not bound by any membrane system and lie free in the cytoplasm, e.g., phosphate granules, cyanophycean granules and glycogen granules.

[NCERT 11th Edition 2025-26 Page No. 91]

Q93 Text Solution:

Glycocalyx differs in composition and thickness among different bacteria. It could be a loose sheath called the slime layer in some, while in others it may be thick and tough, called the capsule. A special membranous structure is the mesosome which is formed by the extensions of plasma membrane into the cell. These extensions are in the form of vesicles, tubules and lamellae. Several ribosomes may attach to a single mRNA and form a chain called polyribosomes or polysome.

[NCERT 11th Edition 2025-26 Page No. 90, 91]

Q94 Text Solution:

Animal cells have centrioles which are absent in almost all plant cells and blue green algae and PPLO.

[NCERT 11th Edition 2025-26 Page No. 91]

Q95 Text Solution:

The middle lamella is a layer mainly of calcium pectate which holds or glues the different neighbouring plant cells together.

[NCERT 11th Edition 2025-26 Page No. 94]

Q96 Text Solution:

The eukaryotes include all the protists, plants, animals and fungi. In eukaryotic cells there is an extensive compartmentalisation of cytoplasm through the presence of membrane bound organelles.

[NCERT 11th Edition 2025-26 Page No. 91]

Q97 Text Solution:

Many bacteria have small circular DNA outside the genomic DNA. These smaller DNA are called plasmids. The plasmid DNA confers resistance to antibiotics.

[NCERT 11th Edition 2025-26 Page No. 90]

Q98 Text Solution:

An improved model of the structure of cell membrane was proposed by Singer and Nicolson (1972) widely accepted as fluid mosaic model. Anton Von Leeuwenhoek first saw and described a live cell. Robert Brown later discovered the nucleus. Schleiden and Schwann together formulated the cell theory.

[NCERT 11th Edition 2025-26 Page No. 87, 88, 94]

Q99 Text Solution:

Ribosomes are non-membrane bound organelles found in all cells – both eukaryotic as well as prokaryotic. Animal cells contain another non-membrane bound organelle called centrosome which helps in cell division.

[NCERT 11th Edition 2025-26 Page No. 88]

Q100 Text Solution:

Endoplasmic reticulum is a network or reticulum of tiny tubular structures scattered in the cytoplasm.It divides the intracellular space into two distinct compartments, i.e., luminal (inside ER) and extra luminal (cytoplasm) compartments. The ER often shows ribosomes attached to their outer surface. The endoplasmic reticulum bearing ribosomes on their surface is called rough endoplasmic reticulum (RER). In the absence of ribosomes they appear smooth and are called smooth endoplasmic reticulum (SER). RER is frequently observed in the cells actively involved in protein synthesis and secretion. They are extensive and continuous with the outer membrane of the nucleus.

[NCERT 11th Edition 2025-26 Page No. 95]

Q101 Text Solution:

- Plant Cells:
  - Have a rigid cell wall made of cellulose.
  - Contain plastids (e.g., chloroplasts for photosynthesis).
  - Have a large central vacuole.
  - Generally lack centrioles.
- Animal Cells:
  - Lack cell walls; only have a plasma membrane.
  - Do not contain plastids

[NCERT 11th Edition 2025-26 Page No. 91-92]

Q102 Text Solution:

Cell membrane is mainly composed of lipids and proteins. The major lipids are phospholipids that are arranged in a bilayer. Also, the lipids are arranged within the membrane with the polar head towards the outer sides and the hydrophobic tails towards the inner part.

[NCERT 11th Edition 2025-26 Page No. 93]

Q103 Text Solution:

Theodore Schwann (1839), a British Zoologist, studied different types of animal cells and reported that cells had a thin outer layer which is today known as the 'plasma membrane'.

[NCERT 11th Edition 2025-26 Page No. 88]

Q104 Text Solution:

Neutral solutes may move across the membrane by the process of simple diffusion along the concentration gradient, i.e., from higher concentration to the lower. Water may also move across this membrane from higher to lower concentration. Movement of water by diffusion is called osmosis.

[NCERT 11th Edition 2025-26 Page No. 94]

Q105 Text Solution:

All eukaryotic cells are not identical. Plant and animal cells are different as the former possess cell walls, plastids and a large central vacuole which are absent in animal cells.The Golgi cisternae are concentrically arranged near the nucleus.

[NCERT 11th Edition 2025-26 Page No. 91,95]

Q106 Text Solution:

A few ions or molecules are transported across the membrane against their concentration gradient, i.e., from lower to the higher concentration. Such a transport is an energy dependent process, in which ATP is utilised and is called active transport, e.g., Na^+/K^+ Pump.

[NCERT 11th Edition 2025-26 Page No. 91]

Q107 Text Solution:

In plants, the tonoplast facilitates the transport of a number of ions and other materials against concentration gradients into the vacuole, hence their concentration is significantly higher in the vacuole than in the cytoplasm.

[NCERT 11th Edition 2025-26 Page No. 91]

Q108 Text Solution:

Lysosomes contain proteases, carbohydrases, lipases, and nucleases.

[NCERT 11th Edition 2025-26 Page No. 96]

Q109 Text Solution:

The detailed structure of the membrane was studied only after the advent of the electron microscope in the 1950. A non-living rigid structure called the cell wall forms an outer covering for the plasma membrane of fungi and plants.

[NCERT 11th Edition 2025-26 Page No. 93,94]

Q110 Text Solution:

Algae have cell wall, made of cellulose, galactans, mannans and minerals like calcium carbonate, while in other plants it consists of cellulose, hemicellulose, pectins and proteins.

[NCERT 11th Edition 2025-26 Page No. 94]

Q111 Text Solution:

(2)

Mesosomes are infoldings of the bacterial plasma membrane that play a role in respiration by increasing the surface area for enzymatic activity.

[NCERT 11th Edition 2025-26 Page No. 91]

Q112 Text Solution:

Golgi apparatus consist of many flat, disc-shaped sacs or cisternae of 0.5μm to 1.0μm diameter.

[NCERT 11th Edition 2025-26 Page No. 95]

Q113 Text Solution:

Prokaryotic cells are generally smaller and multiply more rapidly than the eukaryotic cells.

[NCERT 11th Edition 2025-26 Page No. 89]

Q114 Text Solution:

Mesosomes help in cell wall formation, DNA replication and distribution to daughter cells. They also help in respiration, secretion processes, to increase the surface area of the plasma membrane and enzymatic content.

[NCERT 11th Edition 2025-26 Page No. 91]

Q115 Text Solution:

Lysosome	Formed by the process of packaging in the golgi apparatus
Golgi apparatus	Site of formation of glycoproteins
Smooth endoplasmic reticulum	Major site for synthesis of lipid
Centrosome	Help in cell division

[NCERT 11th Edition 2025-26 Page No. 88,95,96]

Q116 Text Solution:

- Proteins are synthesised by ribosomes on the endoplasmic reticulum (ER)
- These proteins are packaged into vesicles that bud off from the ER and fuse with the cis face of the Golgi apparatus.
- Once inside the Golgi, proteins are modified in the cisternae (e.g., glycosylation, lipid addition).
- After modification, the final materials are released from the trans face for secretion or delivery.

[NCERT 11th Edition 2025-26 Page No. 96]

Q117 Text Solution:

In protists, food vacuoles are formed by engulfing the food particles.

[NCERT 11th Edition 2025-26 Page No. 96]

Q118 Text Solution:

The vacuole is the membrane-bound space found in the cytoplasm. It contains water, sap, excretory product and other materials not useful for the cell. The vacuole is bound by a single membrane called tonoplast. In plant cells the vacuoles can occupy up to 90 per cent of the volume of the cell.

[NCERT 11th Edition 2025-26 Page No. 96]

Q119 Text Solution:

The endomembrane system includes endoplasmic reticulum (ER), golgi complex, lysosomes and vacuoles.

[NCERT 11th Edition 2025-26 Page No. 95]

Q120 Text Solution:

The cell envelope consists of a tightly bound three layered structure i.e., the outermost glycocalyx followed by the cell wall and then the plasma membrane. Although each layer of the envelope performs distinct function, they act together as a single protective unit.

[NCERT 11th Edition 2025-26 Page No. 90]

Q121 Text Solution:

Golgi apparatus

[NCERT 11th Edition 2025-26 Page No. 95]

Q122 Text Solution:

The fluid nature of the membrane is also important from the point of view of functions like cell growth, formation of intercellular junctions, secretion, endocytosis, cell division, etc. One of the most important functions of the plasma membrane is the transport of molecules across.

[NCERT 11th Edition 2025-26 Page No. 94]

Q123 Text Solution:

The fimbriae are small bristle like fibres sprouting out of the cell. In some bacteria, they are known to help attach the bacteria to rocks in streams and also to the host tissues.

[NCERT 11th Edition 2025-26 Page No. 91]

Q124 Text Solution:

Besides the nucleus, the eukaryotic cells have other membrane bound distinct structures called organelles.

[NCERT 11th Edition 2025-26 Page No. 88]

Q125 Text Solution:

In some prokaryotes like cyanobacteria, there are other membranous extensions into the cytoplasm called chromatophores which contain pigments.

[NCERT 11th Edition 2025-26 Page No. 91]

Q126 Text Solution:

The vacuole is the membrane-bound space found in the cytoplasm. It contains water, sap, excretory product and other materials not useful for the cell.

[NCERT 11th Edition 2025-26 Page No. 96]

Q127 Text Solution:

- Nerve cells are some of the longest cells.
- Cell differ greatly size, shape and activities.
- Ribosomes are found not only in the cytoplasm but also within the two organelles –chloroplasts (in plants) and mitochondria and on rough ER
- Cells vary greatly in their size. they can be disc-like, polygonal, columnar, cuboidal, thread-like, or even irregular.

- The size of the cell may vary with the function they perform, e.g., xylem vessels are longer because they have to form long water-carrying channels.

[NCERT 11th Edition 2025-26 Page No. 88, 89]

Q128 Text Solution:

Mycoplasma is the smallest cell (0.3 µm), followed by bacteria (3-5 µm), human RBC (7 µm), and the largest isolated single cell is the ostrich egg. Thus, the correct ascending order of size is Mycoplasma, Bacteria, Human RBC, and Ostrich egg.

[NCERT 11th Edition 2025-26 Page No. 89]

Video Solution:

Q129 Text Solution:

In *Amoeba* the contractile vacuole is important for osmoregulation and excretion.

[NCERT 11th Edition 2025-26 Page No. 96]

Q130 Text Solution:

(2)

Viruses	0.02-0.2 micrometer
PPLO	About 0.1 micrometer
Eukaryotic cell	10-20 micrometer
Bacterium	1-2 micrometer

[NCERT 11th Edition 2025-26 Page No. 90]

Q131 Text Solution:

(3)

The four basic shapes of bacteria are bacillus (rod like), coccus (spherical), vibrio (comma shaped) and spirillum (spiral).

[NCERT 11th Edition 2025-26 Page No. 89]

Q132 Text Solution:

Plasmodesmata are cytoplasmic connections between adjacent plant cells, facilitating transport and communication. They are absent in animal cells.

[NCERT Edition (2025-2026) Class 11th Page no. 13]

Q133 Text Solution:

- Correct – The flagellum in bacteria consists of filament, hook, and basal body.
- Incorrect – Fimbriae and pili do not aid in motility; they help with attachment.
- Correct – Prokaryotic ribosomes = 70S, formed from 50S + 30S subunits.
- Correct – Ribosomes in prokaryotes are associated with the plasma membrane.

[NCERT 11th Edition 2025-26 Page No. 91]

Q134 Text Solution:

In animal cells, lipid-like steroidal hormones are synthesized in the smooth endoplasmic reticulum (SER).

The SER is involved in the synthesis of lipids, steroid hormones, and detoxification of drugs and poisons.

[NCERT 11th Edition 2025-26 Page No. 95]

Q135 Text Solution:

In addition to the genomic DNA (the single chromosome/circular DNA), many bacteria have small circular DNA outside the genomic DNA.

[NCERT 11th Edition 2025-26 Page No. 90]

Q136 Text Solution:

- *Hydra* is a simple multicellular organism, not unicellular.
- Cells in the human body don't work independently; they form tissues, organs, and systems.
- Unicellular organisms don't form tissues.

Q137 Text Solution:

The tissue described has characteristics of epithelial tissue: tight packing and junctions.

- Absorption → Epithelial cells often absorb nutrients (e.g., intestinal lining).
- Tight junction → Prevent leakage across the tissue.
- Diffusion → Thin epithelia (like in alveoli or capillaries) allow gas exchange.

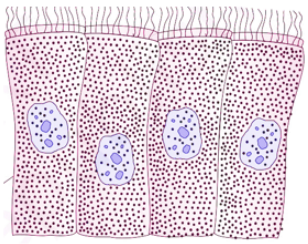
Q138 Text Solution:

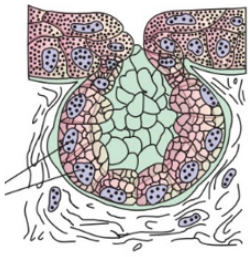
The structure of the cells vary according to their function. Therefore, the tissues are different and are broadly classified into four types : (i) Epithelial, (ii) Connective, (iii) Muscular and (iv) Neural

Q139 Text Solution:

- The primary difference between exocrine and endocrine glands is in how they release their secretions.
- Exocrine glands, like salivary glands and sweat glands, secrete products (such as earwax, oil, saliva, and digestive enzymes) through ducts or tubes that lead to specific target areas.
- In contrast, endocrine glands, like the thyroid and adrenal glands, do not have ducts. They release hormones directly into the bloodstream, and these hormones travel throughout the body to exert their effects on target organs or tissues.

Q140 Text Solution:





(A)-Columnar cells bearing cilia; **(B)**-Multicellular glandular epithelium.

Q141 Text Solution:

- This refers to unicellular organisms, not a division of labour in multicellular ones.
- Not all cells do the same function. Specialization is key.
- Cells in a tissue interact and coordinate; they don't work independently.

Q142 Text Solution:

- Blood contains red blood cells, white blood cells and platelets.
- Blood is the main circulating fluid that helps in the transport of various substances.

Q143 Text Solution:

- Cells are classified into different tissues, not grouped into one unclassified type.
- Structure and location are critical for classification.
- Size doesn't determine tissue type; structure and function do.

Q144 Text Solution:

- Compound epithelium is made of more than one layer (multi-layered) of cells and thus has a limited role in secretion and absorption. Their main function is to protect against chemical and mechanical stresses.
- Connective tissue holds things together but doesn't line surfaces.
- Neural tissue transmits impulses, not for covering or protection.
- Muscular tissue aids in movement, not lining or protecting surfaces.

Q145 Text Solution:

Macrophages in areolar tissue are primarily involved in phagocytosis, immune defense, and debris clearance. They do not secrete collagen fibers. Instead, fibroblasts are responsible for secreting collagen and other extracellular matrix components in connective tissues.
The reason R is correct because collagen fibers do provide strength, elasticity, and flexibility to the tissue.

Q146 Text Solution:
Epithelial tissue has a free surface, which faces either a body fluid or the outside environment.

Q147 Text Solution:

- Squamous epithelium is found in the walls of blood vessels.
- Ciliated epithelium is found in the fallopian tubes.

Video Solution:

Q148 Text Solution:
The squamous epithelium is made of a single thin layer of flattened cells with irregular boundaries. They are found in the walls of blood vessels and air sacs of the lungs and are involved in functions like forming a diffusion boundary.

Q149 Text Solution:

- The cuboidal epithelium is composed of a single layer of cube-like cells. This is commonly found in ducts of glands and tubular parts of nephrons in kidneys, and its main functions are secretion and absorption. The epithelium of the proximal convoluted tubule (PCT) of the nephron in the kidney has microvilli.
- Microvilli aren't limited to flattened cells.
- Microvilli can be on different cell shapes, not just tall ones.

Q150 Text Solution:

- Bones have a hard and non-pliable ground substance, rich in calcium salts and collagen fibres which give bone its strength. The bone cells (osteocytes) are present in the spaces called lacunae.
- The intercellular material of cartilage is solid and pliable and resists compression. Cells of this tissue (chondrocytes) are enclosed in small cavities within the matrix secreted by them.

Q151 Text Solution:
A salivary gland is composed of multiple cells working together to produce saliva, making it a multicellular structure.

Q152 Text Solution:
Connective tissues are most abundant and widely distributed in the bodies of complex animals. They are named connective tissues because of their special function of linking and supporting other tissues/organs of the body.

Q153 Text Solution:

Cuboidal epithelium	Ducts of glands
Ciliated epithelium	Bronchioles
Compound epithelium	Moist surface of buccal cavity
Columnar epithelium	Lining of intestine

Video Solution:

Q154 Text Solution:

- Cilia move particles or mucus in a specific direction over the epithelium. They are mainly present in the inner surface of hollow organs like bronchioles and fallopian tubes.
- Microvilli increase surface area, not cilia.

Q155 Text Solution:

A compound epithelium is made of more than one layer (multi-layered) of cells and thus has a limited role in secretion and absorption. Their main function is to protect against chemical and mechanical stresses.

Q156 Text Solution:

- Simple epithelium is composed of a single layer of cells and functions as a lining for body cavities, ducts, and tubes.
- On the basis of structural modification of the cells, simple epithelium is further divided into three types.

Q157 Text Solution:

- Tight junctions help to stop substances from leaking across a tissue.
- Adhering junctions perform cementing to keep neighbouring cells together.
- Gap junctions facilitate the cells to communicate with each other by connecting the cytoplasm of adjoining cells, for the rapid transfer of ions, small molecules, and sometimes big molecules.

Q158 Text Solution:

- Blood does not secrete fibers.
- Cartilage and bone are specialised, not "dense" connective tissue.
- Connective tissues are the most, not least, abundant.

Q159 Text Solution:

- In complex body of multicellular animals, same basic functions are carried out by different groups of cells in well organised manner.
- Cuboidal epithelium consists of a single layer of cube-like cells.

Q160 Text Solution:

An organ, like the kidney, is composed of multiple tissues working together, including epithelial tissue (lining the tubules), connective tissue (supporting the structure), muscular tissue (contracting for blood flow), and nervous tissue (for communication).

Q161 Text Solution:

- Stomach and intestine of our body are lined by simple columnar epithelium.
- Columnar epithelium helps in secretion and absorption.

Q162 Text Solution:

Loose connective tissue has cells and fibres loosely arranged in a semi-fluid ground substance, for example, areolar tissue present beneath the skin.

Q163 Text Solution:

Cartilage is present in the tip of the nose, outer ear joints, between adjacent bones of the vertebral column, limbs, and hands in adults.

Q164 Text Solution:

- Bone's rigid, mineralized matrix with osteocytes in lacunae provides skeletal support.
- Large amoeboid cells, that are a part of our innate immune system, found in the areolar tissue are called as macrophages.

Video Solution:

Q165 **Text Solution:**
Cartilage, bones and blood are various types of specialised connective tissues.

Q166 **Text Solution:**
Fibres and fibroblasts are compactly packed in the dense connective tissues.

Q167 **Text Solution:**
Gap junctions, a type of cytoplasmic connection, as they facilitate the cells to communicate with each other by connecting the cytoplasm of adjoining cells, for rapid transfer of ions, small molecules and sometimes big molecules.

Video Solution:

Q168 **Text Solution:**
The bone marrow in some bones is the site of production of blood cells.

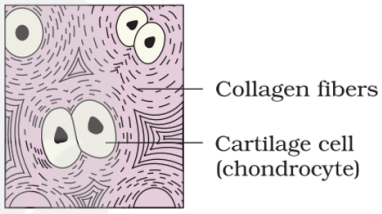
Q169 **Text Solution:**

- Orientation of fibres shows a regular or irregular pattern and are called dense regular and dense irregular tissues.
- In the dense regular connective tissues, the collagen fibres are present in rows between many parallel bundles of fibres.
- Dense irregular connective tissue has fibroblasts and many fibres (mostly collagen) that are oriented differently.

Q170 **Text Solution:**
Tendons, which attach skeletal muscles to bones, and ligaments, which attach one bone to another.

Q171 **Text Solution:**
In the dense regular connective tissues, the collagen fibres are present in rows between many parallel bundles of fibres.

Q172 **Text Solution:**



Cartilage

Video Solution:

Q173 **Text Solution:**
Most of the cartilages in vertebrate embryos are replaced by bones in adults.

Q174 **Text Solution:**
Cartilage is present in the tip of the nose, outer ear joints, between adjacent bones of the vertebral column, limbs, and hands in adults.

Q175 Text Solution:

- Adipose tissue is another type of loose connective tissue located mainly beneath the skin.
- The cells of this tissue are specialised to store fats.
- The excess of nutrients which are not used immediately are converted into fats and are stored in this tissue.

Q176 Text Solution:

Cartilage is present in the tip of the nose, outer ear joints, between adjacent bones of the vertebral column, limbs, and hands in adults.

Q177 Text Solution:

The fundamental principle of tissue organization is that specialized structures of cells (the "building blocks" of tissues) are directly related to the functions of the tissues they form.

Q178 Text Solution:

Bones provided structural support and protection to the softer tissues and organs.

Q179 Text Solution:

Bone cells (osteocytes) are present in the spaces called lacunae.

Q180 Text Solution:

Limb bones, such as the long bones of the legs, serve weight-bearing functions.