NEET UG (2025)

Full Practice Test - 2

DURATION: 60 Minutes   **M.MARKS : 192**

Topics Covered

Physics:	Motion in a straight line, Motion in a plane, Laws of motion
Chemistry:	Solutions, State of Matter
Biology:	**(Botany) :** Cell Cycle and Cell Division
	(Zoology): Breathing and Exchange of Gases

General Instructions:
1. Immediately fill in the particulars on this page of the test booklet.
2. The test is of **60 minutes** duration.
3. The test booklet consists of **48** questions. The maximum marks are **192**.
4. All questions are compulsory.
5. There is only one correct response for each question.
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.
9. **Do not fold or make any stray mark on the Answer Sheet (OMR).**

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).**

Name of the Student (In CAPITALS) : _____

Roll Number : _____

OMR Bar Code Number : _____

Candidate's Signature : _____ Invigilator's Signature _____

SECTION-(I) PHYSICS

1. When a car is stopped by applying brakes, it stops after travelling a distance of 100 m. If speed of car is halved and same retarding acceleration is applied then it stops after travelling a distance of?
   (1) 25 m
   (2) 50 m
   (3) 75 m
   (4) 100 m

2. The displacement x of a particle varies with time t as $x = ae^{-\alpha t} + be^{\beta t}$, where a, b, α and β are positive constants. The velocity of the particle will:
   (1) Go on decreasing with time
   (2) Be independent of α and β
   (3) Drop to zero when $\alpha = \beta$
   (4) Go on increasing with time

3. A ball is allowed to fall from top of a building. If t_1 is time taken to fall first $1/4^{\text{th}}$ of its height and t_2 is time taken to fall last $1/4^{\text{th}}$ of its height then, t_2/t_1 is
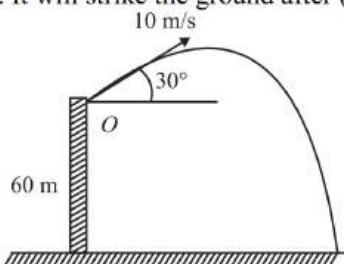   (1) $\dfrac{\sqrt{3}-2}{1}$
   (2) $\dfrac{\sqrt{3}-\sqrt{2}}{1}$
   (3) $\dfrac{\sqrt{2}-3}{1}$
   (4) $\dfrac{2-\sqrt{3}}{1}$

4. In the given diagram, reading of spring balance will be ($g = 10$ m/s^2):
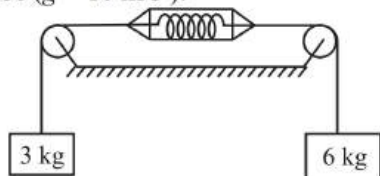
   (1) 30 N
   (2) 40 N
   (3) 60 N
   (4) 80 N

5. A ball is projected from a point O as shown in figure. It will strike the ground after ($g = 10$ m/s^2):

   (1) 4 s
   (2) 3 s
   (3) 2 s
   (4) 5 s

6. Three blocks A, B and C of masses 4 kg, 2 kg and 1 kg respectively, are in contact on a frictionless surface, as shown. If a force of 14 N is applied on the 4 kg block, then the contact force between A and B is:
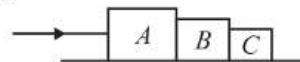
   (1) 18 N
   (2) 2 N
   (3) 6 N
   (4) 8 N

7. A projectile is fired from the level ground at angle θ above the horizontal. Angle of elevation (ϕ) of highest point from point of projection is:
   (1) $\tan\phi = 2\tan\theta$
   (2) $\tan\phi = \tan\theta$
   (3) $\tan\phi = \dfrac{1}{2}\tan\theta$
   (4) $\tan\phi = \dfrac{1}{4}\tan\theta$

8. A projectile is thrown with speed 40 ms^{-1} at angle θ from horizontal. It is found that projectile is at same height at 1s and 3s. What is the angle of projection?
   (1) $\tan^{-1}\left(\dfrac{1}{\sqrt{2}}\right)$
   (2) $\tan^{-1}\left(\dfrac{1}{\sqrt{3}}\right)$
   (3) $\tan^{-1}(\sqrt{3})$
   (4) $\tan^{-1}(\sqrt{2})$

9. A stone thrown upward with a speed u from the top of a tower reaches the ground with a velocity $4u$. The height of the tower is:
   (1) $\dfrac{15u^2}{2g}$
   (2) $\dfrac{7u^2}{2g}$
   (3) $\dfrac{16u^2}{g}$
   (4) Zero

10. A particle is dropped under gravity from rest from a height h ($g = 9.8$ m/sec^2) and it travels a distance $9h/25$ in the last second, the height h is:
    (1) 100 m
    (2) 122.5 m
    (3) 145 m
    (4) 167.5 m

11. Displacement-time ($x - t$) graph of a particle moving along a straight-line path is shown in figure. Average speed of particle in the time interval 0 to 5 second is:
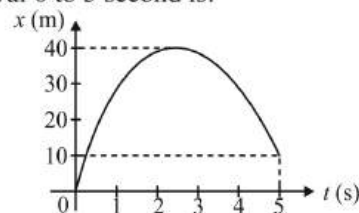
    (1) 2 m/s
    (2) 16 m/s
    (3) 12 m/s
    (4) 14 m/s

12. Match **List-I** with **List-II**.

	List-I		List-II
(A)	$\vec{C} - \vec{A} - \vec{B} = 0$	(I)	
(B)	$\vec{A} - \vec{C} - \vec{B} = 0$	(II)	
(C)	$\vec{B} - \vec{A} - \vec{C} = 0$	(III)	
(D)	$\vec{A} + \vec{B} = -\vec{C}$	(IV)	

Choose the **correct** answer from the options given below:

(1) A-I,   B-IV,   C-II,   D-III
(2) A-IV,   B-III, C-I,   D-II
(3) A-III, B-II,   C-IV,   D-I
(4) A-IV,   B-I,   C-III,   D-II

SECTION-(II) CHEMISTRY

13. 3 g urea is dissolved in 45 g of water. The relative lowering of vapour pressure is:
(molar mass of urea = 60 g/mol, H_2O = 18 g/mol).

(1) 0.05   (2) 0.04
(3) 0.02   (4) 0.01

14. The amount of urea to be dissolved in 500 g of water (K_f = 1.86 K kg mol^{-1}) to produce a depression of 0.186°C in the freezing point is:
(molar mass of urea = 60 g/mol).

(1) 9 g   (2) 6 g
(3) 3 g   (4) 0.3 g

15. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:

Assertion A: 0.1 M solution of NaCl has greater osmotic pressure than 0.1 M solution of glucose at same temperature.

Reason R: In solution, NaCl dissociates to produce more number of particles.

In the light of the above statements, choose the **correct** answer from the options given below.

(1) A is true but R is false.
(2) A is false but R is true.
(3) Both A and R are true and R is the correct explanation of A.
(4) Both A and R are true but R is not the correct explanation of A.

16. A 5.25% solution of a substance is isotonic with a 1.5% solution of urea (molar mass = 60 g mol^{-1}) in the same solvent. If the densities of both the solutions are assumed to be equal to 1 g cm^{-3}, molar mass of the substance will be;

(1) 210.0 g mol^{-1}
(2) 90.0 g mol^{-1}
(3) 115.0 g mol^{-1}
(4) 105.0 g mol^{-1}

17. Dissolving 120 g of urea (molar mass = 60 g/mol) in 1000 g of water gave a solution of density 1.15 g/mL. The molarity of the solution is;

(1) 1.78 M   (2) 1.00 M
(3) 2.05 M   (4) 2.22 M

18. Match **List-I** with **List-II**.

	List-I		List-II
(A)	$C_2H_5OH + H_2O$	(I)	Molal elevation constant
(B)	Ebullioscopic constant	(II)	Molal depression constant
(C)	Cryoscopic constant	(III)	Non-ideal solution with positive deviation
(D)	$H_2O + H_2SO_4$	(IV)	Non-ideal solution with negative deviation

Choose the **correct** answer from the options given below:

(1) A-IV, B-II, C-I,   D-III
(2) A-III, B-I,   C-II, D-IV
(3) A-III, B-II, C-I,   D-IV
(4) A-IV, B-I,   C-II, D-III

19. A solution containing components A and B exhibits positive deviation from Raoult's law only when

A. $\Delta V_{mixing} = +ve$

B. $\Delta H_{mixing} = -ve$

C. A — B attraction forces < A — A and

B — B attraction forces

D. A — B attraction forces > A — A and

B — B attraction forces

Correct Statements are:

(1) A, B and C   (2) A and B

(3) B and D   (4) A and C

20. Which of the following aqueous solutions has the highest freezing point?

(1) 0.1 molal $Al_2(SO_4)_3$

(2) 0.1 molal $BaCl_2$

(3) 0.1 molal $AlCl_3$

(4) 0.1 molal NH_4Cl

21. The vapour pressure of pure benzene at 88°C is 957 mm of Hg and that of toluene at the same temperature is 379.5 mm of Hg. Calculate the composition of benzene-toluene mixture boiling at 88°C:

(P_T = 760 mm of Hg)

(1) $\chi_{benzene} = 0.66$; $\chi_{toluene} = 0.34$

(2) $\chi_{benzene} = 0.34$; $\chi_{toluene} = 0.66$

(3) $\chi_{benzene} = \chi_{toluene} = 0.5$

(4) $\chi_{benzene} = 0.75$; $\chi_{toluene} = 0.25$

22. If 20 mL gas at 1 atm is expanded to 50 mL at constant T, then what is the final pressure?

(1) $20 \times \dfrac{1}{50}$ (2) $50 \times \dfrac{1}{20}$

(3) $1 \times \dfrac{1}{20} \times 50$ (4) 20×50

23. In the equation of state of an ideal gas PV = nRT, the value of the universal gas constant would depend only on:

(1) The nature of the gas

(2) The pressure of the gas

(3) The units of the measurement

(4) None of these

24. A sample of gas occupies 100 mL at 27°C and 740 mm of Hg pressure. When its volume is changed to 80 mL at 740 mm of Hg pressure, the temperature of the gas will be:

(1) 21.6 °C

(2) 240 °C

(3) –33 °C

(4) 89.5 °C

SECTION-(III) BOTANY

25. Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R:

Assertion A: In an animal cell, cytokinesis is achieved by the appearance of a furrow in the plasma membrane.

Reason R: During karyokinesis in animal cells, the furrow gradually deepens and ultimately joins in the centre dividing the cell cytoplasm into two.

In the light of the above statements, choose the **correct** answer from the options given below:

(1) A is true but R is false.

(2) A is false but R is true.

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

(4) Both A and R are correct but R is NOT the correct explanation of A.

26. Match **List-I** with **List-II**.

	List-I		List-II
(A)	Chromosomes start pairing together	(I)	Diplotene
(B)	Four chromatids of each bivalent appear as tetrads	(II)	Zygotene
(C)	Formation of X-shaped structure chiasmata	(III)	Diakinesis
(D)	Transition to metaphase	(IV)	Pachytene

Choose the **correct** answer from the options given below:

(1) A-III, B-II, C-I, D-IV

(2) A-II, B-IV, C-I, D-III

(3) A-I, B-IV, C-III, D-II

(4) A-IV, B-III, C-II, D-I

27. Identify the **correct** statement(s) from the following.

A. Gametes are formed from specialised diploid cells.

B. Meiosis ensures the production of haploid phase in the life cycle of sexually reproducing organisms.

C. During meiosis, chromosome number reduces by half.

D. Meiosis division results in the production of haploid daughter cells.

(1) A only
(2) A and C only
(3) B and D only
(4) A, B, C and D

28. Identify the **correct** statements from the following.

A. The growth of multicellular organisms is due to meiosis.

B. Cell growth results in disturbing the ratio between the nucleus and the cytoplasm.

C. It is essential for the cell to divide to restore the nucleo-cytoplasmic ratio.

D. A very significant contribution of mitosis is cell repair.

(1) A and D only
(2) B and A only
(3) A and C only
(4) B, C and D only

29. Choose the **correct** statement with respect to G_0 phase.

(1) Cells that do not divide further exit G_2 phase to enter this phase.

(2) Cells of this stage remain metabolically inactive and no longer proliferate.

(3) Cells of this stage remain active but no longer proliferate unless called to do so depending on the requirement of organism.

(4) This phase is also known as active stage.

30. Identify the **incorrect** statement.

(1) Four haploid cells are formed at the end of meiosis I.

(2) In some organisms, karyokinesis is not followed by cytokinesis leading to multinucleate condition.

(3) Variations are very important for the process of evolution.

(4) Cell-plate represents the middle lamella between the walls of two adjacent cells.

31. Which event marks the start of the second phase of mitosis?

(1) Splitting of centromeres.

(2) The complete disintegration of the nuclear envelope.

(3) Attachment of spindle fibres to kinetochores of chromosomes.

(4) Chromosomes alignment at the equatorial plate.

32. Movement of sister chromatids toward opposite poles is achieved by:

(1) shortening of microtubules attached to centromere.

(2) shortening of microtubules attached to kinetochores.

(3) elongation of microtubules attached to kinetochores.

(4) elongation of microtubules attached to centromere.

33. Given diagram represents life cycle of a cell showing the changes in DNA content during the various periods as a function of time:
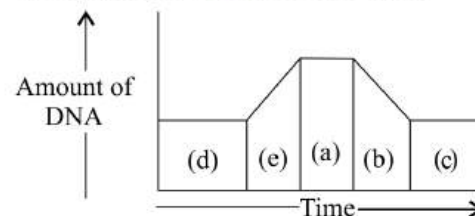
Find out the **correct** option:

(1) (e) – Gap 1 stage, (a) – Synthetic phase

(2) (d) – G_0 stage, (b) – Gap-1 stage, (c) – M stage

(3) (c) – Synthetic phase, (b) – M-phase

(4) (a) – Pre-mitotic phase, (d) – G_1 Stage

34. The number of chromosome and amount of DNA in maize root tip cell in G_1 phase of cell cycle is 20 and 20 Pg respectively. What will be the number of chromosome and amount of DNA in beginning of G_2 phase?

(1) 20; 20 Pg

(2) 20; 40 Pg

(3) 10; 20 Pg

(4) 40; 40 Pg

35. Identify the stages of cell division marked as (i), (ii), and (iii).

(a) Nucleolus, golgi complex and ER reforms in _____(i)_____.

(b) Cells are metabolically active but no longer proliferate in _____(ii)_____ stage.

(c) Centromere split and chromatids separate during _____(iii)_____.

Mark the **correct** option.

	(i)	(ii)	(iii)
(1)	Prophase	G_0	Metaphase
(2)	Telophase	G_0	Anaphase
(3)	Prophase	G_1	Anaphase
(4)	Telophase	G_2	Metaphase

36. What is **not** true about cell cycle?

A. During G_1 phase there is active synthesis of RNA and proteins but no change in its DNA content.

B. In synthesis or S phase, each chromosome carries a duplicate set of genes.

C. During G_2 phase, a cell contains double the amount (4C) of DNA present in the original diploid cell (2C).

D. In S-phase a cell doubles the original diploid (2n) chromosome number.

(1) C and D only

(2) B and C only

(3) D only

(4) B, C and D only

SECTION-(IV) ZOOLOGY

37. How much approximately amount of CO_2 are delivered to the alveoli from the 1000 ml of deoxygenated blood?

(1) 0.4 ml   (2) 4 ml

(3) 40 ml   (4) 400 ml

38. The maximum amount of carbon dioxide carried in blood is __X__ as __Y__

Choose the option which fills the blank **correctly**.

(1) 70%, bicarbonate ions

(2) 97%, carbamino haemoglobin

(3) 97% bicarbonate ions

(4) 70% through plasma

39. Choose the **incorrect** option.

(1) Binding of oxygen with haemoglobin is primarily related to partial pressure of O_2.

(2) Respiratory rhythm centre is primarily responsible for the regulation of breathing.

(3) Trachea divides at the level of 5th lumbar vertebrae.

(4) pCO_2 of systemic vein is 45 mmHg.

40. The partial pressure of CO_2 in tissue:

(1) is more than the alveoli.

(2) equals to the oxygenated blood.

(3) less than the deoxygenated blood.

(4) less than the atmospheric air.

41. Given below are two statements:

Statement I: The volume of air involved in breathing movements can be estimated by using a spirometer.

Statement II: Each haemoglobin molecule can carry a maximum of four molecules of O_2.

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

(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.

42. Choose the **odd** one out w.r.t simple diffusion over their body surface.

(1) Sponges

(2) Flatworms

(3) Coelenterates

(4) Birds

43. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:

Assertion A: Expiration is a process from which the alveolar air is released out.

Reason R: It is due to the low intra-pulmonary pressure present in the lungs.

In the light of the above statements, choose the **correct** answer from the options given below:

(1) A is true but R is false.

(2) A is false but R is true.

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

(4) Both A and R are true but R is not the correct explanation of A.

44. Which of the following **correctly** represents the lung conditions in fibrosis and emphysema respectively?

(1) Inflammation of bronchi and bronchioles and damage in alveolar wall.

(2) Proliferation of fibrous tissues and damage in alveolar wall.

(3) Damage in alveolar wall and proliferation of fibrous tissues.

(4) Damage in alveolar wall and inflammation of bronchi and bronchioles.

45. Match **List-I** with **List-II**:

	List-I		List-II
(A)	Inspiratory Capacity	(I)	4000-4600 ml
(B)	Expiratory Capacity	(II)	2100-2200 ml
(C)	Functional Residual Capacity	(III)	1500-1600 ml
(D)	Vital Capacity	(IV)	3000-3500 ml

Choose the **correct** answer from the options given below:

(1) A-III, B-IV, C-II, D-I

(2) A-I, B-IV, C-II, D-III

(3) A-IV, B-III, C-II, D-I

(4) A-III, B-II, C-I, D-IV

46. The diagram given below shows a view of human respiratory system with labelled **I, II, III** and **IV**. Select the **correct** option which gives correct identification and main function.
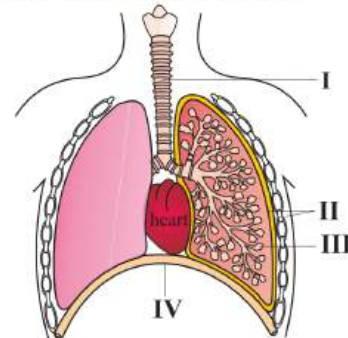
(1) I - Trachea is supported by complete cartilaginous ring.

(2) II - Pleural membrane surround ribs on both side to provide cushion against rubbing.

(3) III - Alveoli is a site for exchange of gases.

(4) IV - Diaphragm pulls it down during expiration.

47. Read the following statements (**A-E**) and select the **correct** option.

A. Pneumotaxic centre is present in the cerebellum region of brain.

B. The role of oxygen in the regulation of respiratory rhythm is quite insignificant.

C. CO_2 is 20-25 times more soluble than O_2.

D. Diaphragm increases the volume of thoracic chamber in the antero-posterior axis during inspiration.

E. About 30% CO_2 is carried by haemoglobin as carbamino-haemoglobin.

Choose the most appropriate answer from the options given below:

(1) B, C and E only   (2) B, C and D only

(3) A, C and E only   (4) A, B and D only

48. Which of the following factors is/are **not** favourable for the formation of oxyhaemoglobin?

(1) High partial pressure of O_2

(2) Low partial pressure of CO_2

(3) High concentration of H^+ ions

(4) Low temperature

NEET UG (2025)

Full Practice Test - 2

DURATION : 60 Minutes

M. MARKS : 192

ANSWER KEY

PHYSICS		CHEMISTRY		BOTANY		ZOOLOGY	
1.	(1)	13.	(3)	25.	(1)	37.	(3)
2.	(4)	14.	(3)	26.	(2)	38.	(1)
3.	(4)	15.	(3)	27.	(4)	39.	(3)
4.	(2)	16.	(1)	28.	(4)	40.	(1)
5.	(1)	17.	(3)	29.	(3)	41.	(3)
6.	(3)	18.	(2)	30.	(1)	42.	(4)
7.	(3)	19.	(4)	31.	(2)	43.	(1)
8.	(2)	20.	(4)	32.	(2)	44.	(2)
9.	(1)	21.	(1)	33.	(4)	45.	(3)
10.	(2)	22.	(1)	34.	(2)	46.	(3)
11.	(4)	23.	(3)	35.	(2)	47.	(2)
12.	(2)	24.	(3)	36.	(3)	48.	(3)

SECTION-(I) PHYSICS

1. **(1)**

Stopping distance $= \dfrac{u^2}{2a}$

[New NCERT Class 11th Page No. 21]

2. **(4)**

$x = ae^{-\alpha t} + be^{\beta t}$

$\dfrac{dx}{dt} = a(-\alpha)e^{-\alpha t} + b(\beta)e^{\beta t}$

$v = b\beta e^{\beta t} - a\alpha e^{-\alpha t}$

As we increase time $e^{\beta t}$ increases and $e^{-\alpha t}$ decreases. So, v keeps on increasing with time.

[New NCERT Class 11th Page No. 11]

3. **(4)**

$t_1 = \sqrt{\dfrac{2}{g}\left(\dfrac{h}{4}\right)}$

$t_2 = \sqrt{\dfrac{2}{g}\left(4 \cdot \dfrac{h}{4}\right)} - \sqrt{\dfrac{2}{g}\left(3 \cdot \dfrac{h}{4}\right)}$

Now, $\dfrac{t_2}{t_1} = \dfrac{\left(2-\sqrt{3}\right)\sqrt{\dfrac{2}{g}\dfrac{h}{4}}}{\sqrt{\dfrac{2}{g}\left(\dfrac{h}{4}\right)}} \Rightarrow \dfrac{t_2}{t_1} = \dfrac{2-\sqrt{3}}{1}$
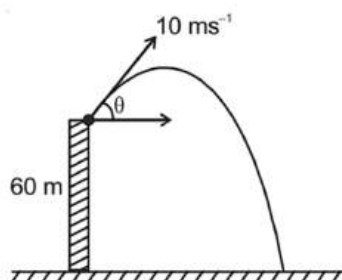
[New NCERT Class 11th Page No. 20]

4. **(2)**

$T = \dfrac{2m_1 m_2 g}{m_1 + m_2} = \dfrac{2 \times 3 \times 6 \times 10}{(3+6)} = 40 \text{ N}$

[New NCERT Class 11th Page No. 59]

5. **(1)**

$s_y = u_y T + \dfrac{1}{2}a_y T^2$

$-60 = 10\sin 30° \cdot T - \dfrac{1}{2}gT^2$

$-60 = 5T - 5T^2$

$T^2 - T - 12 = 0$

$\boxed{T = 4 \text{ s}}$

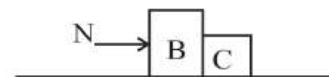**[New NCERT Class 11th Page No. 40]**
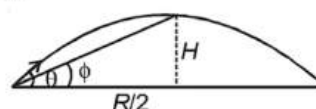
6. **(3)**

F = ma

14 = (4 + 2 + 1)a

a = 2m/s²

N = (2 + 1) × 2 = 6

[New NCERT Class 11th Page No. 58]

7. **(3)**

$\tan\phi = \dfrac{H}{R/2}$

$R = 4H\cot\theta$

$\tan\phi = \dfrac{2H}{4H\cot\theta}$

$\tan\phi = \dfrac{1}{2}\tan\theta$

[New NCERT Class 11th Page No. 40]

8. **(2)**

Also, $t_1 + t_2 = \dfrac{2u\sin\theta}{g}$

$4 = \dfrac{2 \times 40 \times \sin\theta}{10}$

$\sin\theta = \dfrac{1}{2} \Rightarrow \theta = 30°$

So, $\tan\theta = \tan 30° \Rightarrow \dfrac{1}{\sqrt{3}}$

$\boxed{\theta = \tan^{-1}\left(\dfrac{1}{\sqrt{3}}\right)}$

[New NCERT Class 11th Page No. 40]

9. **(1)**

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

$\Rightarrow (-4u)^2 = u^2 + 2(-g)(-h)$

$\Rightarrow 16u^2 = u^2 + 2gh$

$\Rightarrow 15u^2 = 2gh$

$\Rightarrow \boxed{h = \dfrac{15u^2}{2g}}$

[New NCERT Class 11th Page No. 18, 19]

10. **(2)**

The object starts from the rest

Distance travelled in last second $= \dfrac{9h}{25}$

Let n is the total time

$$h = 0 + \dfrac{1}{2}gn^2 \qquad \text{.....(i)}$$

Distance travelled in $(n-1)$ second

$$= h - \dfrac{9h}{25} = \dfrac{16h}{25}$$

$$\dfrac{16h}{25} = \dfrac{1}{2}g(n-1)^2$$

By using value of h from eqn. (1) in eqn. (2)

$$\dfrac{16}{25}\dfrac{gn^2}{2} = \dfrac{1}{2}g(n-1)^2$$

Taking under root both side

$$\dfrac{4}{5}n = n - 1$$

$$\dfrac{n}{5} = 1$$

$$n = 5$$

Now, $h = \dfrac{1}{2} \times 9.8 \times 5^2 = 122.5$ m

[New NCERT Class 11th Page No. 17, 18]

11. **(4)**

$$\dfrac{\text{Total distance}}{\text{Total time}} = \dfrac{70}{5} = 14 \text{ m/s}$$

[New NCERT Class 11th Page No. 14, 15]

12. **(2)**

(A) $\vec{C} - \vec{A} - \vec{B} = 0$

$\vec{A} + \vec{B} = \vec{C}$

(B) $\vec{A} - \vec{C} - \vec{B} = 0$

$\vec{C} + \vec{B} = \vec{A}$

(C) $\vec{B} - \vec{A} - \vec{C} = 0$

$\vec{A} + \vec{C} = \vec{B}$

(D) $\vec{A} + \vec{B} = -\vec{C}$

$\vec{A} + \vec{B} + \vec{C} = 0$

A-IV, B-III, C-I, D-II

[NCERT Class 11th, Page No.68, 69]

SECTION-(II) CHEMISTRY

13. **(3)**

$$n_B = \dfrac{3}{60} = 0.05 \; ; \; n_A = \dfrac{45}{18} = 2.5$$

$$\dfrac{\Delta p}{p^o} = \chi_B = \dfrac{0.05}{2.5 + 0.05} = 0.0196 = 0.02$$

[New NCERT Class 12th Page No. 4]

14. **(3)**

$$\Delta T = K_f \times \dfrac{w_B \times 1000}{M_B \times w_A}$$

$$0.186 = 1.86 \times \dfrac{w_B \times 1000}{60 \times 500}$$

$$w_B = 3g$$

[New NCERT Class 12th Page No. 19]

15. **(3)**

$\pi = i\text{CRT}$

Greater the no. of particles, greater the osmotic pressure.

[New NCERT Class 12th Page No. 21]

16. **(1)**

For isotonic solutions:

$\pi_1 = \pi_2 \qquad \because \pi = \text{CRT}$

$C_1 = C_2$

$$\dfrac{1.5/60}{V} = \dfrac{5.25/M}{V}$$

$$\therefore M = 210 \text{ g/mol}$$

[New NCERT Class 12th Page No. 21]

17. **(3)**

Volume of solution

$$= \dfrac{\text{Mass}}{\text{Density}} = \dfrac{1120}{1.15} = 973.9 \text{ mL}$$

Molarity, $M = \dfrac{w_B \times 1000}{M_B \times V}$

$$= \dfrac{120 \times 1000}{60 \times 973.9} = 2.05 \text{M}$$

[New NCERT Class 12th Page No. 20]

18. **(2)**

Ethanol $+ H_2O \rightarrow$ Azeotropic mixture, Non-ideal solution with positive deviation.

Ebullioscopic constant $(K_b) \Rightarrow$ Molal elevation constant.

Cryoscopic constant $(K_f) \Rightarrow$ Molal depression constant

$H_2O + H_2SO_4 \rightarrow$ Azeotropic mixture, Non-ideal solution with negative deviation.

[New NCERT Class 12th Page No. 18]

19. **(4)**

For a solution exhibiting positive deviation from Raoult's law, A — B attraction forces < A — A and B — B attraction forces.

[New NCERT Class 12th Page No. 16]

20. **(4)**

For NH_4Cl, $i = 2$ which is lowest among the given solutes. Hence depression in freezing point will be least for it.

∴ Highest freezing point of solution.

[New NCERT Class 12th Page No. 14]

21. **(1)**

$$p_T = p_{benzene}^\circ \chi_{benzene} + p_{toluene}^\circ \chi_{toluene}$$

$$760 = 957. \chi_{benzene} + 379.5(1 - \chi_{benzene})$$

$$\chi_{benzene} = 0.66 \text{ and } \chi_{toluene} = 1 - 0.66 = 0.34$$

[New NCERT Class 12th Page No. 12]

22. **(1)**

At constant T,

$$P_1 V_1 = P_2 V_2$$

$$1 \times 20 = P_2 \times 50; \; P_2 = \frac{20}{50} \times 1$$

[New NCERT Class 11th Page No. 143]

23. **(3)**

The value of universal gas constant can be expressed in different units and its value would depend only on the units of the measurement.

[New NCERT Class 11th Page No. 144]

24. **(3)**

V_1 = 100 mL	V_2 = 80 mL
T_1 = 300 K	T_2 = ?
P_1 = 740 mm of Hg	P_2 = 740 mm of Hg

Applying charles law V ∝ T

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}$$

$$\frac{100}{300} = \frac{80}{T_2}$$

$$T_2 = \frac{300 \times 80}{100} = 240 \text{ K}$$

$$T_2 = 240 - 273 = -33°C.$$

[New NCERT Class 11th Page No. 144]

SECTION-(III) BOTANY

25. **(1)**

In an animal cell, cytokinesis is achieved by the appearance of a furrow in the plasma membrane. The furrow gradually deepens and ultimately joins in the centre dividing the cell cytoplasm into two.

[New NCERT Class 11th Page No. 124]

26. **(2)**

Chromosomes start pairing	Zygotene
Four chromatids of each bivalent appear as tetrads	Pachytene
Formation of X-shaped structure chiasmata	Diplotene
Transition to metaphase	Diakinesis

[New NCERT Class 11th Page No. 126]

27. **(4)**

Gametes are formed from specialised diploid cells. Meiosis ensures the production of haploid phase in the life cycle of sexually reproducing organisms. During meiosis, chromosome number reduces by half and results in the production of haploid daughter cells.

[New NCERT Class 11th Page No. 125]

28. **(4)**

The growth of multicellular organisms is due to mitosis. Cell growth results in disturbing the ratio between the nucleus and the cytoplasm. It therefore becomes essential for the cell to divide to restore the nucleo-cytoplasmic ratio. A very significant contribution of mitosis is cell repair.

[New NCERT Class 11th Page No. 125]

29. **(3)**

Some cells in the adult animals do not appear to exhibit division (e.g., heart cells) and many other cells divide only occasionally, as needed to replace cells that have been lost because of injury or cell death. These cells that do not divide further exit G_1 phase to enter an inactive stage called quiescent stage (G_0) of the cell cycle.

[New NCERT Class 11th Page No. 122]

30. **(1)**

Four haploid cells are formed at the end of meiosis II.

[New NCERT Class 11th Page No. 124, 125]

31. (2)

The complete disintegration of the nuclear envelope marks the start of the second phase of mitosis, hence the chromosomes are spread through the cytoplasm of the cell.

[New NCERT Class 11th Page No. 123]

32. (2)

Anaphase II: It begins with the simultaneous splitting of the centromere of each chromosome (which was holding the sister chromatids together), allowing them to move toward opposite poles of the cell by shortening of microtubules attached to kinetochores.

[New NCERT Class 11th Page No. 127]

33. (4)

(a) – Pre-mitotic phase, (b) – M phase, (c) – post mitotic phase, (d) – G_1 Stage, (e) – S phase.

[New NCERT Class 11th Page No. 121]

34. (2)

The number of chromosome and amount of DNA in maize root tip cell in G_1 phase of cell cycle is 20 and 20 Pg respectively.

After S phase, the number of chromosome remain same = 20 and the amount of DNA doubles = 40pg.

[New NCERT Class 11th Page No. 121]

35. (2)

Nucleolus, golgi complex and ER reforms in telophase.

Cells are metabolically active but no longer proliferate in G_0 stage.

Centromere split and chromatids separate during anaphase.

[New NCERT Class 11th Page No. 122, 123, 124]

36. (3)

S or synthesis phase marks the period during which DNA synthesis or replication takes place. During this time the amount of DNA per cell doubles. If the initial amount of DNA is denoted as 2C then it increases to 4C. However, there is no increase in the chromosome number; if the cell had diploid or 2n number of chromosomes at G_1, even after S phase the number of chromosomes remains the same, i.e., 2n.

[New NCERT Class 11th Page No. 121]

SECTION-(IV) ZOOLOGY

37. (3)

Every 100 ml of deoxygenated blood delivers approximately 4 ml of CO_2 to alveoli.

[New NCERT Class 11th Page No. 190]

38. (1)

Nearly 20-25 per cent of CO_2 is transported by RBCs whereas 70 per cent of it is carried as bicarbonate. About 7 per cent of CO_2 is carried in a dissolved state through plasma.

[New NCERT Class 11th Page No. 189]

39. (3)

Trachea divides at the level of 5th thoracic vertebrae.

[New NCERT Class 11th Page No. 184]

40. (1)

Respiratory Gas	Atmospheric Air	Alveoli	Blood (Deoxygenated)	Blood (Oxygenated)	Tissues
O_2	159	104	40	95	40
CO_2	0.3	40	45	40	45

[New NCERT Class 11th Page No. 187]

41. (3)

- Volumes of air involved in breathing movement can be estimated with the help of spirometer.
- Each haemoglobin molecule can carry a maximum of four molecules of O_2.

[New NCERT Class 11th Page No. 191]

42. (4)

Birds respire through lungs.

[New NCERT Class 11th Page No. 183]

43. (1)

- Expiration is a process from which the alveolar air is released out.
- It is due to the high intra pulmonary pressure present in the lungs.

[New NCERT Class 11th Page No. 185]

44. (2)

- Long exposure can give rise to inflammation leading to fibrosis proliferation of fibrous tissues and thus causing serious lung damage.
- Emphysema is a chronic disorder in which alveolar walls are damaged due to which respiratory surface is decreased.
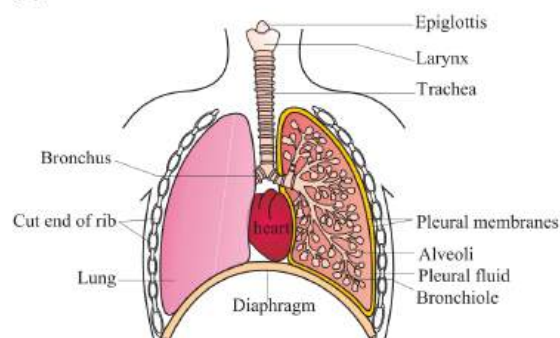
[New NCERT Class 11th Page No. 190, 191]

45. **(3)**

Inspiratory Capacity	3000-3500 ml
Expiratory Capacity	1500-1600 ml
Functional Residual Capacity	2100-2200 ml
Vital Capacity	4000-4600 ml

[New NCERT Class 11th Page No. 187]

46. **(3)**

Alveoli is a thin walled vascular bag like structure and it is the site for the exchange of gases.

[New NCERT Class 11th Page No. 184]

47. **(2)**

- Pneumotaxic centre is present in the pons region of brain.
- About 20-25 per cent CO_2 is carried by haemoglobin as carbamino-haemoglobin

[New NCERT Class 11th Page No. 190]

48. **(3)**

In the alveoli, where there is high pO_2, low CO_2, lesser H^+ concentration and lower temperature, the factors are all favourable for the formation of oxyhaemoglobin.

[New NCERT Class 11th Page No. 189]