

तुमचे जीवन बनवा - त्याचा विवार करा,
 त्याचे स्वप्न पघ्या, त्या कल्पनेवर जगा.
 मेंदू, स्नायू, नसा, तुमच्या शरीराचा प्रत्येक भाग
 त्या कल्पनेने भरलेला असू या
 आणि अन्य प्रत्येक कल्पना सोडून या
 हाच यशाचा मार्ज आहे...

Mark 720	Group PCB	12th Repeater NEET PCB : TEST - 04 : (2025-26)	Date : 20/07/2025
			Time : 3 : 00 Hours
Physics - 45		Chemistry - 45	Biology - 90

Question Booklet Version

P-11

**(Write this number
on your Answer
Sheet)**

Date : 20/07/2025

Time : 3 : 00 Hours

Physics - 45

Chemistry - 45

Biology - 90

PCB Test : • Today's Test Syllabus •

Physics : Ray Optics + Motion in 1D

Chemistry : Atomic Sir + Periodic Table + Nomenclature + Basic GOC-I

Biology : Cell Cycle & Cell division + Morphology of flowering plants + Breathing & Body Fluids

PHYSICS

1. A man runs towards stationary plane mirror at a speed of 15 m/s. What is the speed of his image with respect to mirror :

1) 7.5 m/s 2) 15 m/s
3) 30 m/s 4) 45 m/s

2. Two plane mirrors are at 45° to each other. If an object is placed between them then the number of images will be

1) 5 2) 9
3) 7 4) 8

3. The focal length of a concave mirror is 50 cm. where an object be placed so that its image is two times magnified, real and inverted

1) 75 cm 2) 72 cm
3) 63 cm 4) 50 cm

5. An object is lying at a distance of 90 cm from a concave mirror of focal length 30 cm. The position and nature of image formed by it will be

1) 45 cm, of the size of object
2) 90 cm, smaller than object
3) 30 cm, bigger than object
4) -45 cm smaller than object

6. An object of height 1.5 cm is situated at a distance of 15 cm from a concave mirror. The concave mirror forms its real image of height 3.0 cm. The focal length of concave mirror will be

1) -10 cm 2) -20 cm
3) 20 cm 4) 30 cm

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7. A point object is moving on the principal axis of a concave mirror of focal length 24 cm towards the mirror. When it is at a distance of 60 cm from the mirror, its velocity is 9 cm/sec. What is the velocity of the image at that instant

- 1) 5 cm/sec. 2) 12 cm/sec
3) 4 cm/sec 4) 9 cm/sec

8. A convex mirror has a radius of curvature of 22 cm. If an object is placed 14 cm away from the mirror then its image is formed at

- 1) 6.2 cm on the front side of the mirror
2) 6.2 cm on the back side of the mirror.
3) 51.3 cm on the front of the mirror.
4) 51.3 cm on the back side of the mirror.

9. The focal length of a convex mirror is 20 cm its radius of curvature will be

- 1) 10 cm 2) 20 cm
3) 30 cm 4) 40 cm

10. A microscope is focused on a mark, then a glass slab of refractive index 1.5 and thickness of 6 cm is placed on the mark to get the mark again in focus, the microscope should be moved

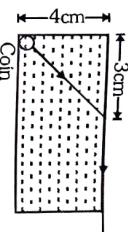
- 1) 4 cm 2) 2 cm
3) 6 cm 4) 8 cm

11. Velocity of light in glass, whose refractive index w.r.t. air is $1.5 = 2 \times 10^8$ m/Sec. In a certain liquid the velocity of light is found to be 2.5×10^8 m/Sec. The refractive index of liquid w.r.t. air is

- 1) 0.64 2) 0.80
3) 1.20 4) 1.44

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16. A small coin is resting on the bottom of a beaker filled with a liquid. A ray of light from the coin travels upto the surface of the liquid and moves along its surface (see figure).



19. An air bubble in a glass slab with refractive index 1.5 (near normal incidence) is 5 cm deep when viewed from one surface and 3 cm deep when viewed from the opposite face. The thickness (in cm) of the slab is:

- 1) 2 $\cos(\mu/2)$
2) $\cos^{-1}(\mu/2)$
3) $2 \cos^{-1}(\mu)$
4) $2 \sin^{-1}(\mu/2)$

12. When a ray of light enters a medium of refractive index μ , it is observed that the angle of refraction is half of the angle of incidence is than angle of incidence is

- 1) $2 \cos(\mu/2)$
2) $\cos^{-1}(\mu/2)$
3) $2 \cos^{-1}(\mu)$
4) $2 \sin^{-1}(\mu/2)$

13. A bubble in glass slab ($\mu = 1.5$) when viewed from one side appears at 5 cm and 2 cm from others then thickness of slab is :

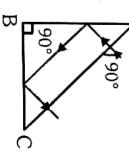
- 1) 3.75 cm 2) 3 cm
3) 10.5 cm. 4) 2.5 cm

14. A ray of light propagates from glass (refractive index = 3/2) to water (refractive index = 4/3).] value of the critical angle

- 1) $\mu = 1.25$ 2) $\mu = 1.33$
3) $\mu = 1.40$ 4) $\mu = 1.50$

15. A ray falls on a prism ABC (AB = BC) and travel as shown in figure.

- The minimum refractive index of the prism material should be



18. The speed of light in media M_1 and M_2 is 1.5×10^8 m/s and 2.0×10^8 m/s respectively. A ray of light enters from medium M_1 to M_2 at an incidence angle i . If the ray suffers total internal reflection, the value of i is:

- 1) Equal to or less than $\sin^{-1}\left(\frac{3}{5}\right)$

- 2) Equal to or less than $\sin^{-1}\left(\frac{3}{4}\right)$

- 3) Less than $\sin^{-1}\left(\frac{2}{3}\right)$
4) Equal to $\sin^{-1}\left(\frac{2}{3}\right)$

21. If the critical angle for total internal reflection from a medium to vacuum is 45° , then velocity of light in the medium is,

- 1) 1.5×10^8 m/s 2) $\frac{3}{\sqrt{2}} \times 10^8$ m/s
3) $\sqrt{2} \times 10^8$ m/s 4) 3×10^8 m/s

22. A microscope is focussed on a mark on a piece of paper and then a slab of glass of thickness 3 cm and refractive index 1.5 is placed over the mark. How should the microscope be moved to get the mark in focus again :

- 1) 1 cm upward
2) 4.5 cm downward
3) 1 cm downward
4) 2 cm upward

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40. A body is released from a great height and falls freely towards the earth. Another body is released from the same height exactly one second later. The separation between the two bodies, two seconds after the release of the second body is

- 1) 4.9 m 2) 9.8 m 3) 19.6 m 4) 24.5 m

41. A body is thrown vertically upwards with velocity u . The distance travelled by it in the fifth and sixth seconds are equal. The velocity u is given by ($g = 9.8 \text{ m/s}^2$)

- 1) 24.5 m/s 2) 49.0 m/s
3) 73.5 m/s 4) 98.0 m/s

42. A stone dropped from the top of the tower touches the ground in 4 sec. The height of the tower is about

- 1) 80 m 2) 40 m 3) 20 m 4) 160 m

43. Two balls A and B of same masses are thrown from the top of the building A, thrown upward with velocity V and B, thrown downward with velocity V , then

- 1) Velocity of A is more than B at the ground
2) Velocity of B is more than A at the ground
3) Both A and B strike the ground with same velocity
4) None of these

44. With what velocity a ball be projected vertically so that the distance covered by it in 5th second is twice the distance it covers in its 6th second ($g = 10 \text{ m/s}^2$)

- 1) 58.8 m/s 2) 49 m/s 3) 65 m/s 4) 19.6 m/s

45. Three different objects of masses m_1 , m_2 and m_3 are allowed to fall from rest and from the same point 'O' along three different frictionless paths. The speeds of the three objects, on reaching the ground, will be in the ratio of

- 1) $m_1 : m_2 : m_3$
2) $m_1 : 2m_2 : 3m_3$
3) $1 : 1 : 1$
4) $\frac{1}{m_1} : \frac{1}{m_2} : \frac{1}{m_3}$

46. In Millikan's experiment, static electric charge obtained by shining X-ray on the oil drop. If the static electric charge on the oil drop is $1.282 \times 10^{-19} \text{ C}$, what will be the number of electrons present on it?

- 1) 8 2) 10
3) 12 4) 6

47. A hydrogenic species requires 30.7 eV to its electron from second orbit to third orbit. atomic number of the element is

- 1) 2 2) 3
3) 4 4) 5

48. The wave number of the lowest energy line in emission spectrum of hydrogen atom in Ba series of lines in terms of R_H is

- 1) $2.645 \times 10^{-10} \text{ m}$
2) $1.322 \times 10^{-10} \text{ m}$
3) $1.851 \times 10^{-10} \text{ m}$
4) $4.6 \times 10^{-10} \text{ m}$

49. If radius of second stationary orbit (in Bohr's atom) is R. Then radius of third orbit will be:

- 1) $R/3$
2) $9R$
3) $R/9$
4) $2.25R$

50. According to Bohr's atomic theory, which of the following is correct?

- 1) Potential energy of electron $\propto \frac{Z^2}{n^2}$
2) The product of velocity of electron and principle quantum number (n) $\propto Z^2$
3) $\frac{8}{9}R_H$
4) $\frac{7}{144}R_H$

51. The distance between 4th and 3rd Bohr orbits of He^+ is:

- 1) $2.645 \times 10^{-10} \text{ m}$
2) $1.322 \times 10^{-10} \text{ m}$
3) $1.851 \times 10^{-10} \text{ m}$
4) $4.6 \times 10^{-10} \text{ m}$

52. The ratio of velocity of the electron in the third and fifth orbit of Li^{2+} would be:

- 1) 3 : 5 2) 5 : 3
3) 25 : 9 4) 9 : 25

53. If radius of second stationary orbit (in Bohr's atom) is R. Then radius of third orbit will be:

- 1) $R/3$
2) $9R$
3) $R/9$
4) $2.25R$

54. According to Bohr's atomic theory, which of the following is correct?

- 1) $\frac{R}{9}$
2) $\frac{9}{R}$
3) $\frac{1}{R}$
4) $\frac{40.8}{54.5} \text{ eV}$

55. What is the separation energy (in eV) for Be^{2+} in the first excited state in eV?

- 1) 13.6 eV 2) 27.2 eV
3) 40.8 eV 4) 54.5 eV

56. The energy of the second Bohr orbit in the hydrogen atom is -3.41 eV. The energy of the second Bohr orbit of He^+ ion would be:

- 1) -0.85 eV 2) -13.64 eV
3) -1.70 eV 4) -6.82 eV

57. Find the value of wave number (\bar{v}) in terms of Rydberg's constant, when transition of electron takes place between two levels of He^+ ion whose sum is 4 and difference is 2.

- 1) $\frac{8R}{9}$
2) $\frac{32R}{9}$
3) $\frac{3R}{4}$
4) $\frac{32}{9R}$

58. What is the shortest wavelength line in the Paschen series of Li^{2+} ion?

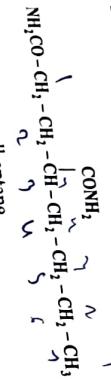
- 1) $\frac{R}{9}$
2) $\frac{9}{R}$
3) $\frac{1}{R}$
4) $\frac{4R}{9}$

59. Which of the following is a favourable factor for cation formation?

- 1) High electron affinity
2) High electronegativity
3) Small atomic size
4) Low ionization potential

QUESTION BOOKLET VERSION: P-11

71. The IUPAC name of compound



1) 1,1,3-Dicarbamoyloheptane

2) 4-Carbamoylooctane

3) 2-n-Butylpentanediaminoketone

4) 2-n-Butylpentanediaminoketone

72. 4 - methyl pent-1,2 - diene is

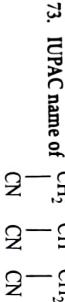
1) $\text{CH}_2 = \text{CH}(\text{CH}_2)_2 \text{CH}_3$

2) $\text{CH}_2 = \text{CHCH}(\text{CH}_3)\text{CH}_2\text{CH}_3$

3) $\text{CH}_3\text{CH} = \text{C}(\text{CH}_3)\text{CH} = \text{CH}_2$

4) $\text{CH}_2 = \text{C} = \text{CH} - \text{CH}(\text{CH}_3)_2$

73. IUPAC name of



1) 3 - cyanopentane-1,5 - dinitrile

2) Propane-1,2,3 - tri nitrile

3) 1,2,3 - tri cyano propane

4) Propane - 1,2,3 - tricarbonitrile

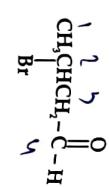
74. Structure of bicyclo (4,3,0) nonane is



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QUESTION BOOKLET VERSION: P-11

75. What is the IUPAC name for the following compound?



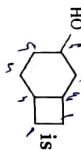
1) 2-bromobutanal

2) α -bromobutanal

3) β -bromobutanal

4) β -bromobutyraldehyde

76. The IUPAC name for the compound



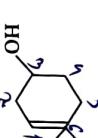
1) 1,1,3-trimethylcyclohex-2-ene

2) 1,3,3-trimethylcyclohex-1-ene

3) 1,1,5-trimethylcyclohex-5-ene

4) 2,6,6-trimethylcyclohex-1-ene

77. What is the IUPAC name for the following compound?



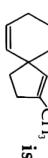
1) 1,1-Dimethylcyclohexen-2-ol

2) 3,3-Dimethyl-1-cyclohexen-6-ol

3) 6,6-Dimethyl-1-cyclohexene-3-ol

4) 4,4-Dimethylcyclohexen-2-ol

78. The IUPAC name of the spiro compound



1) 1-(1-Methylpropyl)cyclobutane

2) 2-(n-butyl)cyclobutane

3) 2-Cyclobutylbutane

4) 1-Cyclobutylbutane

QUESTION BOOKLET VERSION: P-11

79. What is the IUPAC name for the following compound?



1) o-nitro-m-bromotoluene

2) m-bromo-6-nitrotoluene

3) n-bromo-o-nitrotoluene

4) 5-bromo-2-nitrotoluene

80. The IUPAC name for is



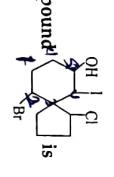
1) 2-chloro-2-bromo-6-iodospiro[4,5]decan-5-ol

2) 2-Bromo-2-Chloro-6-iodospiro[4,5]decan-5-ol

3) 10-Bromo-1-Chloro-6-iodospiro[4,5]decan-7-ol

4) none of these

81. What is the IUPAC name of the following compound?



82. The IUPAC name for is



1) 2-nitro-3-azacycloheptan-2-one

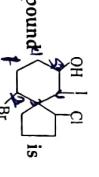
2) 2-azacycloheptan-1-one

3) 1-oxo-3-azacycloheptane

4) 2-oxo-1-azacycloheptane

RCC

83. The IUPAC name of Compound



1) 2-chloro-2-bromo-6-iodospiro[4,5]decan-5-ol

2) 2-Bromo-2-Chloro-6-iodospiro[4,5]decan-5-ol

3) 10-Bromo-1-Chloro-6-iodospiro[4,5]decan-7-ol

4) none of these

84. Caprolactam, its IUPAC name according to aza system of nomenclature is



1) 8-Methylspiro [4,5] deca-1,7-diene

2) 3-Methylspiro [5,4] deca-3,7-diene

3) 2-Methylspiro [5,4] deca-1,6-diene

4) 2-Methylspiro [4,5] deca-1,6-diene

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QUESTION BOOKLET VERSION:P-11

97. Assertion : Kinetochore is essential for cell division.
Reason : Kinetochore serve as the sites of attachment of spindle fibres to the chromosome.

- If both Assertion and Reason are true & the reason is a correct explanation of the assertion
- If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

- If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- If both Assertion and Reason are false.

- If Assertion is true but Reason is false.
- If Assertion is true but Reason is false.

- If both Assertion and Reason are false.
- If both Assertion and Reason are false.

98. Assertion : In anaphase number of chromosomes get doubled.

Reason :- During anaphase each chromosome splits simultaneously and two daughter chromatids now referred to as chromosomes.

- If both Assertion and Reason are true & the reason is a correct explanation of the assertion
- If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

- If both Assertion and Reason are true but Reason is not the correct explanation of the assertion
- If both Assertion and Reason are true but Reason is not the correct explanation of the assertion

- If Assertion is true but Reason is false.
- If both Assertion and Reason are false.

99. Assertion : Meiosis-I is most significant phenomenon from evolution point of view.

Reason : Meiosis-I leads to reduction in chromosome so that consistancy of chromosome can be maintained.

- If both Assertion and Reason are true & the reason is a correct explanation of the assertion
- If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

- If Assertion is true but Reason is false.
- If both Assertion and Reason are false.
- If Assertion is true but Reason is false.
- If both Assertion and Reason are false.

100. Roots associated with nitrogen fixing bacteria are

- Fusiform roots
- Napiform roots
- Nodulated roots
- Conical roots

QUESTION BOOKLET VERSION:P-11

101. Assertion: Telophase-I leads to formation of cells.

Reason : Telophase-I is marked by completion of karyokinesis and cytokinesis as well.

- If both Assertion and Reason are true & the reason is a correct explanation of the assertion
- If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

- If Assertion is true but Reason is false.
- If Assertion is true but Reason is false.

- If Assertion is true but Reason is false.
- If both Assertion and Reason are false.

- If both Assertion and Reason are false.
- If both Assertion and Reason are false.

102. Assertion : Each chromatid is attached with spindle fibres during S-phase

Reason : During Anaphase-I each chromosome found in bivalent form.

- If both Assertion and Reason are true & the reason is a correct explanation of the assertion
- If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

- If both Assertion and Reason are true & the reason is a correct explanation of the assertion
- If both Assertion and Reason are true but Reason is not the correct explanation of the assertion

- If Assertion is true but Reason is false.
- If both Assertion and Reason are false.

103. Radish is an example of -

- Fusiform root
- Napiform root
- Conical root
- Tuberous root

104. The edible part of turnip is -

- Modified Adventitious roots
- Modified tap root
- Stem
- All

QUESTION BOOKLET VERSION:P-11

106. Shoot/Stem develops from:

- Plumule
- Radicle
- Both 1 & 2
- Endosperm

107. Rhizome of ginger is a modification of stem because :

- It bears Adventitious roots
- It bears nodes and internodes
- It is underground
- It stores food material

- In onion the swollen underground structure is -
- Root
- Rhizome
- Bulb
- Tuber

109. Roots developing from plant parts other than radicle are:

- Tap roots
- Adventitious roots
- Both (1) & (2)
- Conical roots

110. Prop roots are:

- Tap roots
- Adventitious roots
- All
- Conical roots

111. Stilt roots occur in:

- Groundnut
- Rice
- Sugarcane
- Wheat

112. Function of stem is to:

- Bear leaves and branches
- Conduction of water and minerals
- Conduction and storage of food
- All

113. A cell has 46 chromosomes at each pole in mitotic telophase. In this division the number of chromosomes at the metaphase was:

- 46
- 23
- 92
- 69

QUESTION BOOKLET VERSION:P-11

114. Label the structure indicated by i, ii, iii and iv:



- i-Chromatid
- ii-Centromere
- iii-Chromosome
- iv-Centriole

115. Number of chromosome pairs at equator in metaphase-I of a diploid plant cell ($n = 25$) chromosomes) shall be

- 50
- 100
- 75
- 25

116. How many meiotic divisions are required during the formation of 500 zygotes, if in males one meiotic division results in formation of four male gametes and in females one meiotic division results in formation of one female gamete?

- 625
- 500
- 100
- 2500

117. In which of the following stages of mitosis, chromosomes are most condensed?

- Stage between the stage of cell plate formation and stage of DNA replication
- Stage between the stage of centrioles separation and stage of splitting of centromere

118. Stage between the stage of DNA replication and stage of initiation of condensation of chromatin

- Stage between the stage of metaphase plate formation and stage of decondensation of chromosomes

QUESTION BOOKLET VERSION: P-11
135. Match the column-I with column-II and select the correct answer.

135. Match the column

Quesn 1

A. Pachytene i. Bouquet stage
B. Zygotene ii. Chiama visible
C. Diplotene iii. Terminalisation
D. Lepotene iv. Gene exchange
E. Diakinesis v. Synapsis

1) A-i, B-ii, C-iii, D-iv, E-v
 2) A-iv, B-v, C-ii, D-i, E-iii
 3) A-iii, B-iv, C-v, D-ii, E-ii
 4) A-ii, B-iii, C-iv, D-i, E-v

136. Assertion (A): Alveoli are the primary sites for exchange of gases in humans.

Reason (R): Alveoli have a large surface area and are richly supplied with blood capillaries.

1) If both Assertion and Reason are true & the reason is a correct explanation of the assertion

2) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

3) If Assertion is true but Reason is false.

4) If both Assertion and Reason are false.

137. Assertion (A): The oxygen dissociation curve is sigmoid in shape.

Reason (R): Binding of one molecule of O₂ to hemoglobin increases the affinity for the next molecule.

1) If both Assertion and Reason are true & the reason is a correct explanation of the assertion

2) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

3) If Assertion is true but Reason is false.

4) If both Assertion and Reason are false.

PCB TEST

138. Which of the following are incorrect regarding RBC production?

RBC production.

3. Hypoxia stimulates erythropoietin secretion by liver.

4. RBCs originate from myeloid stem cells.

1) 1 and 2

2) 3 and 4

3) 1 and 4

4) 2 and 3

39. Assertion (A): CO₂ is mostly transported in blood as carbaminohemoglobin.

Reason (R): Carbonic anhydrase is found only in plasma and catalyzes CO₂ transport.

1) If both Assertion and Reason are true & the reason is a correct explanation of the assertion.

2) If both Assertion and Reason are true but Reason is not the correct explanation of the assertion.

3) If Assertion is true but Reason is false.

4) If both Assertion and Reason are false.

40. Assertion (A): At the tissue level, oxygen is released from oxyhemoglobin.

Reason (R): Low pO₂, high pCO₂ and high pH tissues facilitate oxygen release.

1) If both Assertion and Reason are true & the reason is a correct explanation of the assertion.

2) If both Assertion and Reason are true but Reason is not the correct explanation of the assertion.

3) If Assertion is true but Reason is false.

4) If both Assertion and Reason are false.

141. Assertion (A): Residual volume can be measured using a spirometer.

Reason (R): Residual volume remaining in the lungs

If both Assertion and Reason are true & the reason is a correct explanation of the assertion.

1) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

2) If both Assertion and Reason are true but Assertion is false but Reason is true.

3) If Assertion is true but Reason is false.

4) If Assertion is false but Reason is true.

142. Assertion (A): During inspiration, the diaphragm contracts and flattens.

Reason (R): Contraction of EICM increases thoracic volume and decreases intrapulmonary pressure.

1) If both Assertion and Reason are true & the reason is a correct explanation of the assertion.

2) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

3) If Assertion is true but Reason is false.

4) If both Assertion and Reason are false.

143. Assertion (A): Vital capacity is lower than total lung capacity.

Reason (R): Vital capacity includes residual volume.

1) If both Assertion and Reason are true & the reason is a correct explanation of the assertion.

2) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

3) If Assertion is true but Reason is false.

4) If both Assertion and Reason are false.

144. Which of the following are incorrect about hemoglobin in RBCs?

1. Hemoglobin is a conjugated protein made of globin and heme.
2. One molecule of hemoglobin can carry eight oxygen molecules.
3. Each RBC contains about 270 million hemoglobin molecules.
4. Hemoglobin binds O₂ irreversibly.
 - 1) 2 and 4 ✕
 - 2) 1 and 3
 - 3) 1 and 2K
 - 4) 3 and 4

145. Assertion (A): Gaseous exchange in lungs occurs

3. Assertion (A): Gaseous exchange in lungs occurs across a thin diffusion membrane.

Reason (R): The diffusion membrane comprises alveolar epithelium, capillary endothelium, and their fused basement membranes.

1) If both Assertion and Reason are true & the reason is a correct explanation of the assertion

2) If both Assertion and Reason are true but Reason is not the correct explanation of the Assertion.

3) If Assertion is true but Reason is false.

4) If both Assertion and Reason are false.

146. Assertion (A): Hemoglobin has a higher affinity for carbon monoxide than oxygen.

Reason (R): Carboxyhemoglobin formation is irreversible and blocks oxygen transport.

1) If both Assertion and Reason are true & the reason is a correct explanation of the assertion

2) If both Assertion and Reason are true but Reason is not the correct explanation of the Assertion.

3) If Assertion is true but Reason is false.

4) If both Assertion and Reason are false.

147. Assertion (A): Pneumotaxic center in the Pons decrease the duration of inspiration.

Reason (R): Pneumotaxic center limits inspiration phase to regulate breathing rhythm.

1) If both Assertion and Reason are true & the reason is a correct explanation of the assertion

2) If both Assertion and Reason are true but Reason is not the correct explanation of the Assertion.

3) If Assertion is true but Reason is false.

4) If both Assertion and Reason are false.

QUESTION BOOKLET VERSION:P-11

161. Which of the following statements correctly describe the trachea?

1. Trachea is a straight tube extending up to the mid-thoracic cavity.
2. It is supported by C-shaped cartilaginous rings.
3. Trachea branches into the left and right bronchi.
4. It is lined by stratified squamous epithelium.

- 1) 1, 2, and 3
- 2) 2 and 4
- 3) 1 and 4
- 4) All are correct

162. Which statements are correct about alveoli?

1. They provide a large surface area for gaseous exchange.
2. They are surrounded by a dense network of capillaries.
3. Alveolar walls are made up of squamous epithelium.
4. The diffusion membrane includes alveolar epithelium, basement membrane, and capillary endothelium.

- 1) 1, 2, and 3
- 2) 2 and 4
- 3) 1 and 4
- 4) All of the above

163. Which statements correctly describe hemoglobin's role in gas transport?

- 1) 1, 2, and 4
- 2) 1 and 3
- 3) 2, 3, and 4
- 4) All of the above

164. It is lined by stratified squamous epithelium.

- 1) 1, 2, and 3
- 2) 2 and 4
- 3) 1 and 4
- 4) All are correct

165. Which statements are correct about the oxygen dissociation curve?

1. It shows the percentage saturation of hemoglobin with oxygen at different pH levels.
2. A rightward shift occurs in high CO₂ and low pH.
3. Bohr effect promotes oxygen release in tissue.
4. The curve is linear in shape.

- 1) 1, 2, and 3
- 2) 2, 3 and 4
- 3) 1 and 4
- 4) All of the above

166. Which of the following statements about respiratory rhythm are correct?

1. Respiratory rhythm is controlled by the medulla oblongata.
2. Pneumotaxic centre of the pons inhibits inspiration.
3. Chemosensitive area near the medulla responds to O₂ concentration.
4. High CO₂ concentration stimulates the respiratory center.

- 1) 1, 2, and 4
- 2) 2 and 3
- 3) 1 and 4
- 4) All of the above

QUESTION BOOKLET VERSION:P-11

167. Which of the following are correct about respiratory disorders?

1. Asthma is caused by inflammation and narrowing of bronchioles.
2. Emphysema leads to reduced respiratory surface area.
3. Pneumonia is always caused by viral infection.
4. Occupational lung diseases like silicosis are due to dust inhalation.

- 1) 1 and 4
- 2) 1 only
- 3) 2 and 3
- 4) 3 and 4

168. Which are correct statements regarding partial pressure?

1. Partial pressure of O₂ in alveolar air is ~104 mmHg.
2. pCO₂ in oxygenated blood is ~40 mmHg.
3. Gases diffuse from higher to lower partial pressure.
- 4) All of the above

169. Which of the following statements are correct about intercostal muscles?

1. They play's main role in altering thoracic volume.
2. External intercostals elevate the ribs during inspiration.
3. Internal intercostals help in forced expiration.
4. They are found between alveolar walls.

170. Which statements are incorrect regarding RBCs and gas exchange?

1. CO₂ binds to the heme portion of hemoglobin.
2. O₂ binds to Fe²⁺ in the heme group.
3. Hemoglobin increases the oxygen-carrying capacity of blood.
4. Hb transports CO₂ mainly as bicarbonate.

171. Which statements are correct about the lungs?

1. Right lung has 3 lobes and left has 2 lobes.
2. Pleural fluid between membranes allows frictionless movement.
3. Lungs are enclosed in the thoracic cavity.
4. Gas exchange occurs in the bronchi.

172. Which statements are incorrect regarding the oxygen dissociation curve?

1. It is hyperbolic in shape.
2. High pCO₂ shifts the curve to the right.
3. Low pH enhances oxygen unloading.
4. Bohr effect is not related to pH or CO₂.

173. Which of the following are incorrect regarding exchange of gases in alveoli?

1. Gases move against their partial pressure gradients.
2. Diffusion is rapid due to thin diffusion membrane.
3. Partial pressure difference is a key factor in diffusion.
4. Total surface area of alveoli is around 500 cm².

- 1) 1 and 2
- 2) 2 and 3
- 3) 1 and 3
- 4) 1 and 4

QUESTION BOOKLET VERSION: P-11

174. Which of the following are incorrect regarding forced expiration?

1. It is an active process involving muscular effort.
 2. Internal intercostal muscles contract.
 3. Abdominal muscles play no role.
 4. Diaphragm contracts forcefully.
- 1 and 4 2) 2 and 3
 3) 1 and 4 4) 3 and 4

175. Which statements are incorrect regarding diffusion of gases?

1. Oxygen diffuses from blood to alveolar air.
 2. CO₂ diffuses from pulmonary capillaries to alveoli.
 3. Diffusion is passive and driven by partial pressure gradient.
 4. Diffusion occurs across 3 thin layers.
- 1) 1 only 2) 2 and 3
 3) 1 and 3 4) 1 and 4

176. Which of the following are incorrect regarding anatomical adaptations for breathing?

1. Epiglottis prevents entry of food into trachea.
 2. Trachea is lined with non-ciliated squamous epithelium.
 3. C-shaped cartilage prevents collapse of trachea.
 4. Bronchi are muscular tubes with cartilaginous support.
- 1) 2 and 3
 2) 2 Only
 3) 3 and 4
 4) 1 and 2

177. Which statements are incorrect regarding exchange at tissue level?

1. Oxygen diffuses from tissues to blood.
 2. CO₂ is picked up from tissues by blood.
 3. pCO₂ is higher in tissues than in blood.
 4. Conditions at alveoli favor oxygen loading.
- 1 and 4 2 and 3
 3) 3 and 4 4) 1 Only

178. Which of the following statements are incorrect about the Bohr effect?

1. It facilitates oxygen loading at tissues.
 2. It is due to low pH and high CO₂.
 3. It shifts the oxygen dissociation curve to the left.
 4. It helps hemoglobin bind more oxygen at the lungs.
- 1) 1 and 3 2) 2 and 4
 3) 1, 3 and 4 4) 2 and 3

179. Which of the following statements are incorrect regarding types of breathing?

1. Thoracic breathing involves mainly the diaphragm.
 2. Abdominal breathing uses intercostal muscles.
 3. During forced inspiration, accessory muscles are involved.
 4. Normal breathing is entirely passive.
- 1 and 2 2) 2 and 4
 3) 1 and 4 4) 3 and 4

180. Which are incorrect features of hemoglobin?

1. It is a protein with four iron-containing heme groups.
 2. It forms irreversible complexes with CO.
 3. It transports CO₂ as bicarbonate ions.
 4. Hemoglobin is present in plasma.
- 1) 2 and 4 2) 4 Only
 3) 1 and 2 4) 3 and 4