



Aakash

Medical | IIT-JEE | Foundations

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MM : 720

Final Test Series(P1)_NEET2026_Test-01B

Time : 180 Min.

Topics Covered:

Physics: Units & Measurements, Motion in a Straight Line, Motion in a Plane

Chemistry: Amines, Biomolecules, Principles Related to Practical Chemistry

Botany: Ecosystem, Biodiversity and Conservation

Zoology: Animal Kingdom

General Instructions :

Duration of Test is 3 hrs.

The Test consists of 180 questions. The maximum marks are 720.

There are four parts in the question paper consisting of Physics, Chemistry, Botany and Zoology having 45 questions in each part of equal weightage.

Each question carries +4 marks. For every wrong response, -1 mark shall be deducted from the total score. Unanswered/unattempted questions will be given no marks.

Use blue/black ballpoint pen only to darken the appropriate circle.

Mark should be dark and completely fill the circle.

Dark only one circle for each entry.

Dark the circle in the space provided only.

Rough work must not be done on the Answer sheet and do not use white fluid or any other rubbing material on the Answer sheet.

Some parts of this question paper have been masked to maintain its integrity. The missing information will be announced during/before the test.

PHYSICS

- A vector $\vec{A} = \hat{i} + \sqrt{3}\hat{j}$ is rotated clockwise through an angle 15° about origin in x-y plane. The unit vector along the new vector is

(1) $\sqrt{2}\hat{i} + \sqrt{2}\hat{j}$ (2) $\frac{\hat{i} + \hat{j}}{2}$
 (3) $\frac{\hat{i}}{\sqrt{2}} + \frac{\hat{j}}{\sqrt{2}}$ (4) $\frac{1}{2}\hat{i} - \frac{1}{2}\hat{j}$
- If $y = x^2 + 3x - 2$, find the value of x at which y is minimum.

(1) $-\frac{3}{2}$ (2) $\frac{3}{2}$
 (3) $\frac{2}{3}$ (4) $-\frac{2}{3}$
- A car moving with speed 20 m/s along a straight line is given uniform retardation 5 m/s². The distance covered by it before stopping is

(1) 20 m (2) 25 m
 (3) 30 m (4) 40 m
- The angle made by the vector $\vec{A} = 7\hat{i} + 8\hat{j}$ with x-axis is

(1) $\tan^{-1}\left(\frac{7}{8}\right)$ (2) $\tan^{-1}\left(\frac{8}{7}\right)$
 (3) $\sin^{-1}\left(\frac{7}{8}\right)$ (4) $\cos^{-1}\left(\frac{8}{7}\right)$
- In a Vernier Callipers, 50 VSD coincides with 48 MSD and 1 MSD is 0.5 mm. Least count of vernier callipers is

(1) 0.01 mm (2) 0.02 mm
 (3) 0.04 mm (4) 0.05 mm
- Two particles having mass m and $2m$ are moving in a circular path having radius r and $2r$ respectively. If their time periods are same, then the ratio of their angular velocities will be

(1) 1 : 2 (2) 2 : 1
 (3) 1 : 1 (4) $\sqrt{2} : 1$
- A projectile is projected from ground passes through points (4, 5) m and (5, 4) m during its motion. The range of the projectile will be ($g = 10 \text{ m/s}^2$)

(1) $\frac{61}{7} \text{ m}$ (2) $\frac{61}{9} \text{ m}$
 (3) $\frac{31}{7} \text{ m}$ (4) $\frac{31}{9} \text{ m}$
- Let \vec{v} and \vec{a} be the instantaneous velocity and acceleration of a particle moving in a plane. Then rate of change of speed $\frac{dv}{dt}$ of the particle is equal to

(1) $|\vec{a}|$
 (2) $\frac{\vec{v} \cdot \vec{a}}{a}$
 (3) The component of \vec{a} parallel to \vec{v}
 (4) The component of \vec{a} perpendicular to \vec{v}
- A body moves along x-axis such that its position changes with time as $x = \frac{t^3}{3} - \frac{5t^2}{2} + 6t + 2$ where x is in m, t is in s. Mark the wrong statement.

(1) At $t = 2$ s, body changes its direction of motion.
 (2) At $t = 3$ s, body changes its direction of motion.
 (3) Body has non-uniform accelerated motion.
 (4) Velocity-time graph of the motion is downward parabolic.

10. Which of the following is the most precise measurement?
 (1) 0.001 m^3 (2) 0.010 m^3
 (3) 0.011 m^3 (4) 0.0001 m^3
11. A 300 m long train moving with uniform velocity of 90 km/h. Time taken by it to cross a 700 m long bridge is
 (1) 40 s (2) 60 s
 (3) 80 s (4) 100 s
12. A compressive force $F = (5 \pm 0.005)$ dyne is applied on a rod of cross-sectional radius $r = (2 \pm 0.01)$ cm. The maximum percentage error in stress is
 (1) 1.2% (2) 1.1%
 (3) 1.5% (4) 0.5%
13. Position of a particle moving along x-axis is given by $x = (4 + 3t + 6t^2)$ m. Speed of the particle at time $t = 1$ s is
 (1) 10 m/s (2) 13 m/s
 (3) 12 m/s (4) 15 m/s
14. Equation of a straight line having slope 1 and intercept on y-axis is 2, will be
 (1) $y = x + 2$ (2) $y = 2x + 1$
 (3) $y = x - 2$ (4) $y = 2x + 2$
15. A bullet from a gun is fired towards a wooden block with velocity u . When bullet travels 30 cm through the block along its length horizontally, velocity of bullet becomes $\frac{u}{3}$. Then it further penetrates into the block in the same direction before coming to rest, exactly at 5 cm from the other end of the block. The total length of the block is
 (1) 33.75 cm (2) 38.75 cm
 (3) 42.75 cm (4) 36.25 cm
16. The pair of quantities not having same dimensions is
 (1) Angular momentum and angular impulse
 (2) Work and torque
 (3) Young's modulus and energy density
 (4) Force and surface tension
17. Magnitude of resultant of two vectors of magnitude 3 and 4 cannot be
 (1) 1 (2) 5
 (3) 7 (4) 8
18. Planck's constant (h) has the same dimensions as
 (1) $\frac{\text{Energy}}{\text{Frequency}}$
 (2) Angular momentum
 (3) Power
 (4) Both (1) and (2)
19. A projectile is projected with a velocity $\vec{v} = a\hat{i} + b\hat{j}$. The radius of curvature of the trajectory of the particle at the topmost point of its trajectory is
 (1) $\frac{b}{ag}$ (2) $\frac{ag}{b}$
 (3) $\frac{a^2}{g}$ (4) $\frac{b^2}{ag}$
20. A body is moving with constant acceleration in $x - y$ plane. Then
 (1) Its velocity changes in x-direction only
 (2) Its velocity changes in y-direction only
 (3) Its velocity may change in both x and y direction
 (4) Its velocity must change in both x and y direction
21. Given below are two statements: one is labelled as Assertion (A) and other is labelled as Reason (R).
Assertion (A): Two bodies when projected vertically upward from the ground with different initial speeds, cover same distance in last second of their journey.
Reason (R): For a particle projected vertically upward, the distance travelled in last second before coming to rest does not depend on initial speed (u), where $u > 10 \text{ m s}^{-1}$.
 In the light of above statements, choose the most appropriate answer from the options given below.
 (1) Both A and R are true and R is the correct explanation of A
 (2) Both A and R are true and R is not the correct explanation of A
 (3) A is true but R is false
 (4) A is false but R is true
22. In a screw gauge, the pitch is 1 mm and there are 100 divisions on circular scale. The least count of the screw gauge is
 (1) 0.01 mm (2) 0.02 cm
 (3) 0.1 cm (4) 0.1 mm
23. If u is the speed of projectile fired at an angle 60° with respect to horizontal, then what is its speed at the highest point?
 (1) u (2) $2u$
 (3) $\frac{u}{4}$ (4) $\frac{u}{2}$
24. The resultant of \vec{P} and \vec{Q} is \vec{R} . If \vec{Q} is doubled, then \vec{R} is doubled. When \vec{Q} is reversed, \vec{R} is again doubled. Ratio of $P : Q : R$ is.
 (1) $\sqrt{3} : \sqrt{2} : 1$ (2) $\sqrt{2} : \sqrt{3} : \sqrt{2}$
 (3) $1 : \sqrt{3} : \sqrt{2}$ (4) $2 : 3 : 4$
25. An object travels 40 m in 5 s and then another 40 m in 10 s. Average speed of the object for complete journey is
 (1) 11.44 m/s (2) 5.33 m/s
 (3) 7 m/s (4) 2.45 m/s
26. A particle is projected from the ground with an initial speed of v at an angle θ with horizontal. The average velocity of the particle between its point of projection and highest point of trajectory is,
 (1) $v \cos \theta$ (2) $\frac{v}{2} \sqrt{1 + \cos^2 \theta}$
 (3) $\frac{v}{2} \sqrt{1 + 3 \cos^2 \theta}$ (4) $\frac{v}{2} \sqrt{1 + \sin^2 \theta}$
27. A man swims in a river of width d such that it reaches exactly opposite point on the bank in time t . He covers distance d while swimming downstream in time T . The ratio of man's speed in still water to the speed of river water will be :
 (1) $\frac{T^2 + t^2}{T^2 - t^2}$ (2) $\frac{T^2 - t^2}{T^2 + t^2}$
 (3) $\frac{t^2 + T^2}{t^2 - T^2}$ (4) $\frac{t^2 - T^2}{t^2 + T^2}$

28. If $y = x - x^2$ is the path of a projectile projected from ground. Match column I with column II in S.I units ($g = 10 \text{ m/s}^2$)

Column I	Column II
(A) Speed of projection (u)	(P) 1
(B) Time of flight (T)	(Q) 3.16
(C) Range (R)	(R) 0.25
(D) Maximum height (H)	(S) 0.45

- (1) A(Q); B(S); C(P); D(R) (2) A(Q); B(S); C(R); D(P)
 (3) A(Q); B(P); C(S); D(R) (4) A(P); B(Q); C(R); D(S)

29. Number of significant figures in 0.50300 is

- (1) 5 (2) 4
 (3) 3 (4) 6

30. A particle is dropped from point A at a certain height from ground. It falls freely and passes through three points B, C and D with $BC = CD$. The time taken by the particle to move from B to C is 2 seconds and from C to D is 1 second. The time taken to move from A to B is

- (1) 1 s (2) 0.5 s
 (3) 0.25 s (4) 0.75 s

31. The force acting on a particle depends upon its position (x) and time (t) as $F = A^2 \sin(\sqrt{B}x - ct)$. Select the correct answer from the options given below.

Statement A: Dimensional formula for A is $[M^{1/2} L^{1/2} T^{-1}]$.

Statement B: Dimensional formula for $\frac{\sqrt{B}}{c}$ is $[L^{-1} T^1]$

Statement C: $\sqrt{B}x$ and ct are dimensionless.

Statement D: B and c are dimensionless.

- (1) Only statements A and B are correct
 (2) Only statements B and C are correct
 (3) Only statements C and D are correct
 (4) Only statements A, B and C are correct
32. A new system of units is chosen in which density (ρ), frequency (f) and velocity (V) are taken as fundamental quantities. Column I contains a list of physical quantities and column II list dimensional formula. Match Column I with Column II.

Column I	Column II
(A) Force	(P) $[\rho^1 f^{-4} V^5]$
(B) Angular Momentum	(Q) $[\rho^1 f^{-3} V^3]$
(C) Mass	(R) $[\rho^0 f^{-1} V^1]$
(D) Length	(S) $[\rho^1 f^{-2} V^4]$

- (1) A(S); B(P); C(Q); D(R) (2) A(P); B(Q); C(R); D(S)
 (3) A(S); B(P); C(R); D(Q) (4) A(Q); B(P); C(S); D(R)

33. A park in the form of a square has an area of $(100 \pm 0.4) \text{ m}^2$. The side of the park is

- (1) $(10 \pm 0.02) \text{ m}$ (2) $(10 \pm 0.03) \text{ m}$
 (3) $(10 \pm 0.04) \text{ m}$ (4) $(10 \pm 0.3) \text{ m}$

34. When the number 6.03587 is rounded up to the second place of decimals, it becomes

- (1) 6.035 (2) 6.04
 (3) 6.03 (4) 6.036

35. A body is projected horizontally from top of a tall tower with velocity V_0 . The speed at the moment when magnitude of horizontal and vertical displacements become equal is

- (1) $2V_0$ (2) $\sqrt{3}V_0$
 (3) $\sqrt{5}V_0$ (4) $\sqrt{2}V_0$

36. Initial velocity of a projectile from the horizontal ground is $(\hat{i} + \sqrt{3}\hat{j}) \text{ m/s}$, the equation of its trajectory is ($g = 10 \text{ m/s}^2$)

- (1) $y = x\sqrt{3} - \frac{x^2}{\sqrt{3}}$ (2) $y = \sqrt{3}x - 5x^2$
 (3) $y = 5x - \sqrt{3}x^2$ (4) $y = x - \frac{x^2}{\sqrt{3}}$

37. In a circular motion, the angle between the acceleration and velocity may be

- (1) 90° (2) Acute
 (3) Obtuse (4) All of these

38. Read the given statements and choose the **correct** option.

Statement A: It is not possible to have constant velocity and variable acceleration.

Statement B: If a particle has non-zero acceleration, its velocity has to vary in magnitude only.

- (1) Only statement A is correct
 (2) Only statement B is correct
 (3) Both statements A and B are correct
 (4) Both statements A and B are incorrect

39. Three physical quantities A, B and C are related as $A = B + C$, then

- (1) Dimensions of A, B and C are same
 (2) Dimensions of A, B and C are different
 (3) Dimensions of A and B are same but dimensions of A and C are different
 (4) Dimensions of B and C are same but dimensions of A and C are different

40. A boy completes one round of a circular track of radius 20 m in 50 seconds. The displacement at the end of 4 minute 10 second will be

- (1) 40 m (2) 20 m
 (3) $80\pi \text{ m}$ (4) Zero

41. A person sitting on the top of a tall building is dropping balls at regular intervals of one second. Find ratio of the distance covered by the 3rd, 4th and 5th ball when 6th ball is being dropped. Take $g = 10 \text{ m/s}^2$.

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

42. A displacement vector of magnitude 5 m makes an angle 30° with the x-axis. Its rectangular components in x-y plane are (in m)

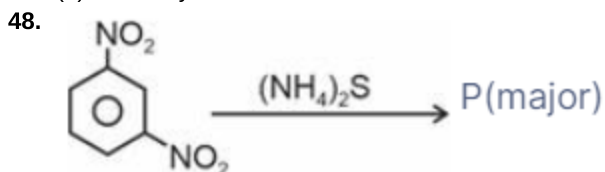
- (1) $5\sqrt{3}, \frac{5}{2}$ (2) $\frac{5\sqrt{3}}{2}, \frac{5}{2}$
 (3) $\frac{5}{\sqrt{3}}, 5\sqrt{2}$ (4) $5\sqrt{3}, \frac{5\sqrt{3}}{2}$

43. The magnitude of displacement of a particle moving in a circle of radius R with constant angular speed ω varies with time t as

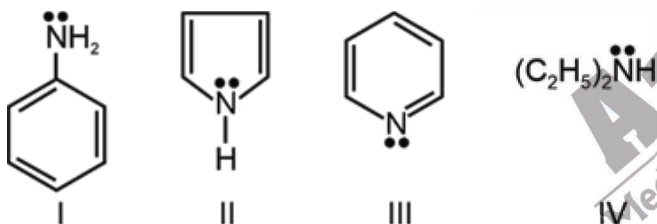
- (1) $2R \sin \omega t$ (2) $2R \cos \omega t$
 (3) $2R \sin \frac{\omega t}{2}$ (4) $2R \cos \frac{\omega t}{2}$

44. A motorboat needs to reach a point located upstream at 30° w.r.t. normal (to bank), on the opposite bank of a river flowing at 5 m/s. If the boat's speed relative to water is $5\sqrt{3}$ m/s, then the angle at which the driver should steer the boat is
- (1) 120° with respect to the direction of flow
 - (2) 150° with respect to the direction of flow
 - (3) 90° with respect to the direction of flow
 - (4) Not possible

46. The electrolytic reduction of nitrobenzene in strongly acidic medium produces
- (1) Aniline
 - (2) p-Aminophenol
 - (3) Azoxybenzene
 - (4) Azobenzene
47. The correct IUPAC name for the compound $(\text{CH}_3-\text{CH}_2)_2\text{NCH}_3$ is
- (1) N-methyl-N-ethylethanamine
 - (2) N-ethyl-N-methylethanamine
 - (3) N,N-diethylmethanamine
 - (4) N-methylbutanamine



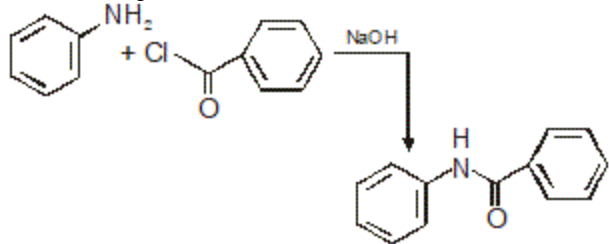
49. The correct order of basicity of



in water is

- (1) $\text{IV} > \text{III} > \text{I} > \text{II}$
- (2) $\text{IV} > \text{I} > \text{III} > \text{II}$
- (3) $\text{IV} > \text{II} > \text{III} > \text{I}$
- (4) $\text{III} > \text{I} > \text{IV} > \text{II}$

50. The following reaction



is known by the name

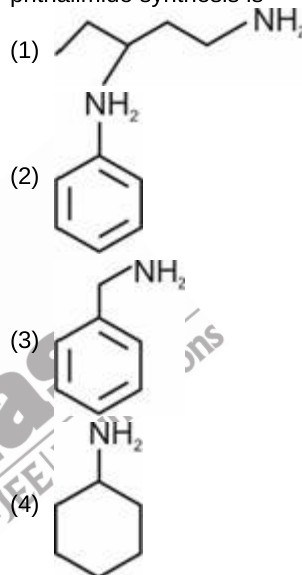
- (1) Acetylation reaction
- (2) Schotten-Baumen reaction
- (3) Friedel-Craft's reaction
- (4) Perkin's reaction

45. In a new system of units, unit of mass is taken as 10 kg, unit of length is taken as 100 m and unit of time is 0.5 minute. Weight of a body in this system, if in S.I system its weight is 10 N.
- (1) 5 units
 - (2) 45 units
 - (3) 9 units
 - (4) 90 units

CHEMISTRY

51. The reaction of Benzenediazonium bromide with $\text{Cu}_2\text{Br}_2/\text{HBr}$ to give bromobenzene is known as
- (1) Gatterman reaction
 - (2) Swarts reaction
 - (3) Sandmeyer reaction
 - (4) Balz-Schiemann reaction

52. The compound which cannot be synthesised by Gabriel phthalimide synthesis is



53. Given below are two statements

Statement I: Benzene diazonium chloride reacts with aniline in acidic medium gives p-amino azobenzene (yellow in colour).

Statement II: Reaction of benzenediazonium chloride with aniline in acidic medium is an example of electrophilic substitution reaction.

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

- (1) Both statement I and statement II are correct
 - (2) Both statement I and statement II are incorrect
 - (3) Statement I is correct but statement II is incorrect
 - (4) Statement I is incorrect but statement II is correct
54. Which among the following is a cyclic amino acid?
- (1) Proline
 - (2) Arginine
 - (3) Lysine
 - (4) Serine
55. Which of the following nitrogenous base is not common in both DNA and RNA?
- (1) Adenine
 - (2) Cytosine
 - (3) Thymine
 - (4) Guanine

56. Match List-I with List-II.

	List-I		List-II
a.	Glucose $\xrightarrow{\text{NaHSO}_3}$ (i)		Gluconic acid
b.	Glucose $\xrightarrow{\text{HNO}_3}$ (ii)		No reaction
c.	Glucose $\xrightarrow[\text{H}_2\text{O}]{\text{Bromine}}$ (iii)		n-hexane
d.	Glucose $\xrightarrow[\Delta]{\text{HI}}$ (iv)		Saccharic acid

Choose the correct answer from the options given below.

- (1) a(ii), b(iv), c(i), d(iii) (2) a(ii), b(iv), c(iii), d(i)
 (3) a(ii), b(iii), c(iv), d(i) (4) a(ii), b(i), c(iii), d(iv)

57. Given below are the two statements

Statement I: Lactose is a disaccharide and is found in milk.**Statement II:** Lactose is composed of β -D-galactose and β -D-fructose.

In light of the above statements, choose the correct answer.

- (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 incorrect
 (4) Both statement I and statement II are correct

58. Consider the following statements

- (a) α -form and β -form of glucose are called anomers.
 (b) α -D-(+)-glucopyranose has five chiral centres.
 (c) melting point of α -form of glucose and β -form of glucose is same.

The correct statements are

- (1) (a) and (b) only (2) (b) and (c) only
 (3) (a) and (c) only (4) (a), (b) and (c)

59. In titration of Mohr's salt against KMnO_4 , iron is oxidized.

The oxidation number of iron changes from

- (1) +1 to +3 (2) +2 to +3
 (3) +3 to +4 (4) +1 to +2

60. Colour of phenolphthalein in acidic medium is

- (1) Pink (2) Orange
 (3) Blue (4) Colourless

61. The pair which represents non-essential amino acids is

- (1) Proline and serine
 (2) Lysine and Histidine
 (3) Leucine and Valine
 (4) Methionine and phenylalanine

62. Which of the following is/are incorrect regarding denaturation of proteins?

- (a) Biological activity remains unaltered.
 (b) 2° structure remains unaltered.
 (c) 3° structure remains unaltered.

The correct option is

- (1) (a) only (2) (a) and (b) only
 (3) (b) and (c) only (4) (a), (b) and (c)

63. Which of the following is a neutral amino acid?

- (1) Lysine (2) Histidine
 (3) Leucine (4) Glutamic acid

64. Given below are two statements:

Statement (I) : If adrenal cortex does not function properly then one of the results may be Addison's disease**Statement (II):** Steroid hormones are produced by adrenal cortex and gonads.

In the light of above statements, choose the correct answer.

- (1) Statement (I) is correct but statement (II) is incorrect.
 (2) Both statement (I) and statement (II) are correct
 (3) Both statement (I) and statement (II) are incorrect
 (4) Statement (I) is incorrect but statement (II) is correct.

65. Prussian blue colour observed during detection of nitrogen is due to the formation of

- (1) $[\text{Fe}(\text{NCS})]^{2+}$ (2) $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$
 (3) $[\text{Fe}(\text{CN})_6]^{3-}$ (4) $[\text{Fe}(\text{CN})_5\text{NOS}]^{4-}$

66. Given below are the two statements: One is labelled as **Assertion (A)** and other is labelled as **Reason (R)**.**Assertion (A) :** During the neutralisation reaction of acetic acid with sodium hydroxide, the heat released is less than 57 kJ mol^{-1} .**Reason (R) :** During neutralisation of acetic acid with strong base some energy is required for ionisation of acetic acid.

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

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

67. $\text{CH}_3 - \text{C} \equiv \text{N} \xrightarrow{\text{H}_2/\text{Ni}}$ Product

The product is,

- (1) $\text{CH}_3 - \text{NH}_2$
 (2) $\text{CH}_3 - \text{CH}_2 - \text{NH}_2$
 (3) $\begin{array}{c} \text{CH}_3 - \text{N} - \text{CH}_3 \\ | \\ \text{H} \end{array}$
 (4) $\text{CH}_3 - \text{CH}_3$

68. Match List-I with List-II.

List-I	List-II
Cation group number	Group reagent
a. Group-I	(i) H_2S gas in presence of dil.HCl
b. Group-II	(ii) H_2S in presence of NH_4OH
c. Group-III	(iii) Dilute HCl
d. Group-IV	(iv) NH_4OH in presence of NH_4Cl

Choose the correct answer from the options given below.

- (1) a(iv), b(ii), c(iii), d(i) (2) a(i), b(iii), c(iv), d(ii)
 (3) a(iii), b(i), c(ii), d(iv) (4) a(iii), b(i), c(iv), d(ii)

69. Consider the following statements

- (a) Amylopectin is insoluble in water
 (b) Amylopectin is long unbranched chain polymer of α -D-glucose
 (c) Amylose is water soluble component which constitutes about 15-20% of starch.

The correct statements are

- (1) (a) and (b) only (2) (b) and (c) only
 (3) (a) and (c) only (4) (a), (b) and (c)

70. Given below are the two statements

Statement I: A tripeptide contains three amino acids linked by two peptide linkages.**Statement II:** Insulin is an example of globular protein.

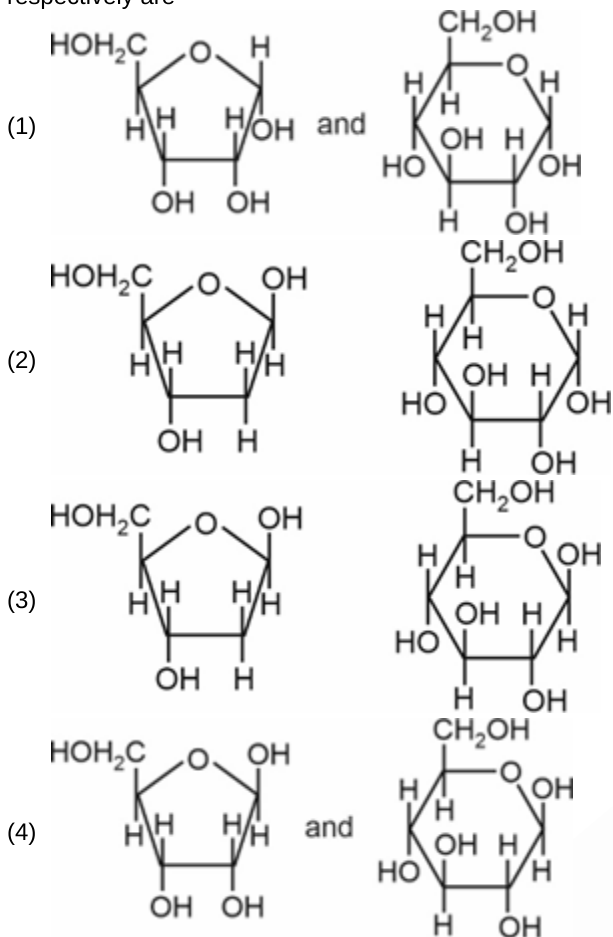
In light of above statements, choose the correct answer

- (1) Statement I is correct but statement II is incorrect
 (2) Both statement I and statement II are correct
 (3) Both statement I and statement II are incorrect
 (4) Statement is incorrect but statement II is correct.

71. Rickets and scurvy are caused by the deficiency of

- (1) Vitamin D and Vitamin C respectively
 (2) Vitamin E and Vitamin B_1 respectively
 (3) Vitamin K and Vitamin B_2 respectively
 (4) Vitamin C and Vitamin B_{12} respectively

72. Correct structures of β -D-ribose and β -D-glucose respectively are



73. Consider the following statements
 (a) Thyroxine is produced in thyroid gland
 (b) Epinephrine and norepinephrine mediate response to external stimuli
 (c) Progesterone is responsible for preparing the uterus for implantation of fertilised egg.
 The correct statements are
 (1) (a) and (b) only (2) (b) and (c) only
 (3) (a) and (c) only (4) (a), (b) and (c)

74. Given below are the two statements

Statement I: Cellulose occurs exclusively in plants

Statement II: Cellulose is a straight chain polysaccharide and composed of only α -D-glucose units.

In light of above statements, choose the correct answer

- (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
75. Correct order of pK_b values of the given compounds in aqueous medium is
 (a) Benzenamine
 (b) N, N-Dimethylaniline
 (c) N-methylaniline
 (d) Phenylmethanamine
 Choose the correct option.
 (1) (d) > (b) > (c) > (a) (2) (a) > (c) > (b) > (d)
 (3) (d) > (a) > (c) > (b) (4) (b) > (a) > (d) > (c)

76. Consider the following bases

- (a) Adenine
 (b) Cytosine
 (c) Uracil
 (d) Guanine

Pyrimidine bases are

- (1) (b) and (c) only (2) (a) and (b) only
 (3) (a), (b) and (c) only (4) (c) and (d) only

77. The compound which will not give positive isocyanide test is

- (1) Isopropylamine (2) Aniline
 (3) N, N-Diethylbutylamine (4) n-propylamine

78. Consider the following statements

(a) p-Nitroacetanilide on reaction with aqueous alkali gives p-nitroaniline.

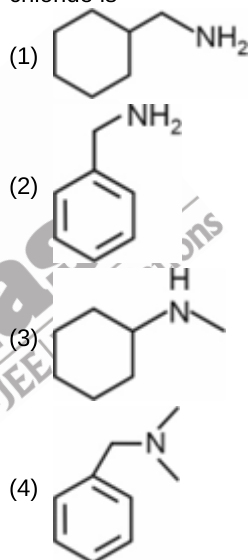
(b) Aniline does not undergo Friedel-Crafts reaction

(c) Aniline reacts with bromine water at room temperature to give a white precipitate of 2, 4, 6-tribromoaniline.

The correct statements are

- (1) (a) and (b) only (2) (b) and (c) only
 (3) (a) and (c) only (4) (a), (b) and (c)

79. Compound which does not react with benzenesulphonyl chloride is



80. Consider the following compounds

- (a) $n\text{-C}_4\text{H}_9\text{OH}$
 (b) $(\text{C}_2\text{H}_5)_2\text{NH}$
 (c) $n\text{-C}_4\text{H}_9\text{NH}_2$
 (d) $\text{C}_2\text{H}_5\text{N}(\text{CH}_3)_2$

The correct order of boiling point is

- (1) (c) > (a) > (b) > (d) (2) (a) > (b) > (c) > (d)
 (3) (c) > (b) > (a) > (d) (4) (a) > (c) > (b) > (d)

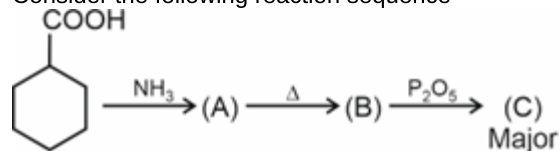
81. Methyl cyanide on reaction with stannous chloride in presence of hydrochloric acid gives compound (A) which on hydrolysis gives compound (B). The compound (B) is

- (1) $\text{CH}_3\text{CH}_2\text{OH}$ (2) CH_3CHO
 (3) CH_3COOH (4) $\text{CH}_3\text{CH}_2\text{NH}_2$

82. Given below are the two statements
Statement I: Benzenediazonium chloride is stable in cold water but reacts with water when warmed.
Statement II: Benzenediazonium fluoroborate on heating gives fluorobenzene
 In light of above statements, choose the correct answer
 (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
83. The compound which gives immediate turbidity with $ZnCl_2$ and Conc. HCl is
 (1) 4-Methylhexan-1-ol (2) 4-Methylpentan-1-ol
 (3) 4-Methylpentan-2-ol (4) 2-Methylpentan-2-ol
84. The compound which give positive iodoform test is
 (1) Benzophenone (2) Acetophenone
 (3) Benzaldehyde (4) Isobutyraldehyde
85. Match List-I with List-II.
- | | List-I
(Metal cations) | | List-II
(Colour of the flame
observed by naked
eye) |
|----|---------------------------|-------|--|
| a. | Ba^{2+} | (i) | Brick red |
| b. | Ca^{2+} | (ii) | Crimson red |
| c. | Cu^{2+} | (iii) | Apple green |
| d. | Sr^{2+} | (iv) | Green flame with blue
centre |
- Choose the correct match
 (1) a(i), b(iii), c(iv), d(ii) (2) a(iii), b(i), c(iv), d(ii)
 (3) a(iii), b(i), c(ii), d(iv) (4) a(ii), b(iv), c(i), d(iii)
86. Colour of PbS and $PbCrO_4$ respectively are
 (1) Black and Green (2) Blue and yellow
 (3) Black and Yellow (4) Yellow and Orange
87. Consider the following statements
 (a) $Cu_2[Fe(CN)_6]$ is a chocolate brown colour solid.
 (b) I_2 in starch solution gives blue colour
 (c) Chromate ion on reaction with H_2O_2 forms chromium pentoxide
 The correct statements are
 (1) (a) and (b) only (2) (b) and (c) only
 (3) (a) and (c) only (4) (a), (b) and (c)

88. The pair of compounds which can be distinguished by Tollens' test is
 (1) Benzaldehyde and Acetaldehyde
 (2) Acetone and Benzaldehyde
 (3) Propanal and Acetaldehyde
 (4) Methanol and Ethanol

89. Consider the following reaction sequence



Major product (C) is

- (1)
- (2)
- (3)
- (4)

90. Ethyl isonitrile on hydrolysis with dilute HCl majorly gives
 (1) Ethanamine and methanol
 (2) Ethanamine and Formic acid
 (3) Ethanoic acid and methanamine
 (4) Formic acid and Ethanamide

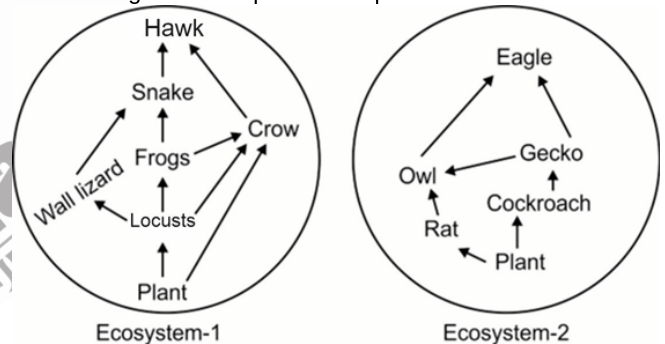
BOTANY

91. The food web
 (1) Is a network of interconnected food chains at different trophic levels
 (2) Is usually unstable and decreases the overall stability of ecosystem
 (3) Can accommodate only a single species
 (4) In an ecosystem is represented in form of ecological pyramids
92. In ecological pyramids,
 (1) The trophic level represents a species as such
 (2) A given species always occupy more than one trophic levels
 (3) Energy at a lower trophic level is always more than that at a higher level
 (4) Decomposers are always kept at bottom trophic level

93. Consider the following food chain.
 Trees → Birds → Lice → Bacteria.
 The above given food chain is an example of
 (1) Predatory food chain (2) Grazing food chain
 (3) Detritus food chain (4) Parasitic food chain
94. Which among the following is the least productive ecosystem?
 (1) Coral reefs (2) Deep sea
 (3) Tropical rain forest (4) Agroecosystem
95. Two main structural features of an ecosystem are
 (1) Standing crop and nutrient cycling
 (2) Productivity and standing state
 (3) Species composition and stratification
 (4) Stratification and energy flow
96. In forest ecosystem, bottom strata or layer is occupied by
 (1) Trees only (2) Herbs only
 (3) Both shrubs and trees (4) Both herbs and grasses

97. Select **incorrect** one w.r.t. humus.
- (1) Highly resistant to microbial activity
 - (2) Decomposed at an extremely slow rate
 - (3) Light coloured amorphous substance
 - (4) Degraded by some microbes and release inorganic substance
98. Which one of the following organisms can be placed at second as well as third trophic levels?
- (1) Sparrow
 - (2) Snake
 - (3) Eagle
 - (4) Jackal
99. Vertical distribution of different species occupying different levels in an ecosystem is called
- (1) Species composition
 - (2) Speciation
 - (3) Energy flow
 - (4) Stratification
100. Major conduit of energy flow in an aquatic ecosystem is
- (1) Detritus food chain
 - (2) Grazing food chain
 - (3) Parasitic food chain
 - (4) Auxiliary food chain
101. Extinction of more than 200 species of Cichlid fish in a lake of East Africa occurred because of introduction of
- (1) Carrot grass
 - (2) *Clarias*
 - (3) Nile Perch
 - (4) *Lantana*
102. There are A wildlife sanctuaries and B biosphere reserves in India. Here, A and B respectively are
- (1) 90 and 448
 - (2) 448 and 14
 - (3) 448 and 90
 - (4) 90 and 14
103. India having more than 50,000 genetically different strains of rice, and 1000 varieties of mango shows
- (1) Species diversity
 - (2) Community diversity
 - (3) Genetic diversity
 - (4) Ecological diversity
104. Which of the following regions is considered as the sacred groves in Meghalaya?
- (1) Khasi and Jaintia Hills
 - (2) Aravalli Hills
 - (3) Chanda and Bastar
 - (4) Sarguja
105. Match the column-I with column-II and choose the **correct** option.
- | Column-I | Column-II |
|----------------------|----------------|
| A. Quagga | (i) Mauritius |
| B. Thylacine | (ii) Africa |
| C. Dodo | (iii) Russia |
| D. Steller's sea cow | (iv) Australia |
- (1) A(ii), B(i), C(iv), D(iii)
 - (2) A(iv), B(iii), C(i), D(ii)
 - (3) A(ii), B(iv), C(i), D(iii)
 - (4) A(iii), B(i), C(iv), D(ii)
106. If we consider the different animals like birds (B), reptiles (R), fishes (F) and mammals (M), the **correct** order for their number of species in Amazonian rain forest will be?
- (1) F > M > R > B
 - (2) B > M > F > R
 - (3) B > F > M > R
 - (4) F > B > M > R
107. If we analyse the species-area relationship among the entire continent, we will find that the regression coefficient (z) values in the range of
- (1) 1.2 to 2.6
 - (2) 0.1 to 0.2
 - (3) 0.6 to 1.2
 - (4) 0.2 to 0.6
108. Which of the following statements is **correct**?
- (1) Passenger pigeon became extinct due to co-extinction
 - (2) Species diversity increases from pole to equator
 - (3) Organisms at high trophic levels in a food chain, are less susceptible to extinction
 - (4) Now the tropical rain forest covers 14% of earth's land area, which was previously only 0.6%

109. As per the Red Data Book of IUCN, a taxon which is facing an extremely high risk of extinction in the wild in the immediate future, is put in the category of
- (1) Critically endangered
 - (2) Endangered
 - (3) Vulnerable
 - (4) Low risk
110. According to David Tilman's outdoor plots experiments, which of the following statements is **true** for a stable community?
- (1) More diverse community will show less year to year variation in total biomass.
 - (2) Increased diversity contributes to lesser productivity.
 - (3) More diverse communities show more year to year variation in total biomass.
 - (4) Decreased diversity contributes to more productivity.
111. When a host fish species becomes extinct, its unique assemblage of parasites also meets the same fate. This exemplifies
- (1) Habitat loss
 - (2) Co-extinctions
 - (3) Over-exploitation
 - (4) Alien-species invasion
112. In Rivet popper hypothesis, the rivets on the wings represents
- (1) Key species that drive major ecosystem function
 - (2) Invasive species that drive major ecosystem function
 - (3) Ecosystem
 - (4) Extinct species of an ecosystem
113. Given below are the representations of two ecosystems, with each having different species composition.



- How many of the given statements are correct for the above ecosystems?
- (a) Ecosystem-2 has more species diversity than the ecosystem-1.
 - (b) Ecosystem-2 can be said less stable than ecosystem-1.
 - (c) The largest food chain in ecosystem-1 has 0.1 kJ for hawk as available energy and in 2nd largest food chain, hawk has 1 kJ of available energy, if plant has 1000 kJ as GPP.
 - (d) Ecosystem-2 has three food chains, of which, two have T₄ trophic level as the highest one, while the other has T₅ as the highest one.
 - (e) Major conduit of energy flow for both the ecosystems is the GFC.
- (1) Two
 - (2) Three
 - (3) Four
 - (4) Five

- 114.** Gross primary productivity minus respiratory losses is equal to
- (1) The rate of formation of new organic matter by consumers
 - (2) The rate of production of organic matter during photosynthesis
 - (3) The available biomass for the consumption to herbivores or decomposers
 - (4) The amount of biomass or organic matter produced per unit area over a time period by plants during photosynthesis

115. Read the following statements (A – D).

- A. The total energy output in the form of heat from an ecosystem should be equal to the solar input.
 - B. There is always unidirectional flow of energy towards the higher trophic levels.
 - C. Energy is created during the process of photosynthesis by producers.
 - D. Detritus, from which DFC starts, can be obtained from the organisms of all the trophic levels in the entire food chain.
- Select the **correct** option.

- (1) Only A and B are correct
- (2) Only A and D are correct
- (3) Only B and D are correct
- (4) Only B and C are correct

116. Select the **correct** pair of characteristics for the given ecosystems from the following options.

	Tree ecosystem	Grassland ecosystem
(1)	Biomass of the top carnivore is lower than the organism at T ₁ level	Biomass at higher trophic level is higher than the lower trophic levels.
(2)	Primary productivity is higher than the secondary productivity	Primary productivity is lower than the secondary productivity
(3)	Pyramid of number can be inverted	Pyramid of number for grazing food chain is always upright
(4)	It is not connected to the DFC at any level	It is connected to the DFC at all levels

- (1) (1)
- (2) (2)
- (3) (3)
- (4) (4)

117. The following data represents the energy flow in a salt marsh ecosystem.

Form of energy	kcal m ⁻² yr ⁻¹
• Solar radiation	600,000
• Gross primary productivity	34,580
• Net primary productivity	6,585
• Gross secondary productivity	305
• Net secondary productivity	81
• Detritus leaving marsh	3,671

Which of the following options is **correct** w.r.t. the above data?

- (1) About 5.8% of solar energy is used in net primary production, and the respiratory loss by the producer is 28,000 kcal m⁻² yr⁻¹
- (2) About 5.8% of solar energy is used in gross primary production, and the respiratory loss by consumer is 224 kcal m⁻² yr⁻¹
- (3) About 0.6% of solar energy is converted into gross primary production and respiratory loss by producer is 27,995 kcal m⁻² yr⁻¹
- (4) About 0.1 % of solar energy is converted into net primary production and detritus accounts for more than 80% of NPP.

118. Read the following Assertion (A) and Reason (R) statements and select the **correct** option.

Assertion (A): With the increase in the depth of the oceans, the intensity of the light decreases, decreasing the rate of photosynthesis.

Reason (R): Despite oceans occupying about 70 percent of the surface of earth, the productivity of the oceans is only 55 billion tons.

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

119. State the following statements as **true (T)** or **false (F)** and select the **correct** option.

A. Measurement of biomass is expressed in terms of dry weight rather than fresh weight because it eliminates variability caused by moisture content.

B. In a terrestrial ecosystem, major producers are herbaceous and woody plants, while in aquatic ecosystem, producers are planktons, algae and higher plants.

C. Of the incident solar radiation, less than 50% is photosynthetically active radiation and only 1% of PAR results into GPP.

D. Each bar in the ecological pyramid of energy indicates the amount of energy present at each trophic level in a given time or annually, per unit area.

	A	B	C	D
(1)	T	F	T	T
(2)	F	T	T	F
(3)	T	F	F	T
(4)	T	T	F	T

- (1) (1)
- (2) (2)
- (3) (3)
- (4) (4)

120. Select the **correct** option if in an ecosystem, gross primary productivity (GPP) of the first trophic level is $4000x(\text{kcal m}^{-2}) \text{yr}^{-1}$.

- (1) Available energy for trophic level where primary consumers are placed will be $40x(\text{k cal m}^{-2}) \text{yr}^{-1}$
- (2) The amount of energy fixed at the trophic level where secondary consumers are placed will be $\frac{40x}{10}(\text{k cal m}^{-2}) \text{yr}^{-1}$
- (3) Available energy for trophic level where tertiary consumers are placed will be $\frac{4}{10}x(\text{k cal m}^{-2}) \text{yr}^{-1}$
- (4) Fixed energy at the trophic level where primary consumer are placed will be $\frac{40}{10} \times (\text{k cal m}^{-2}) \text{yr}^{-1}$

121. Read the following statements and select the **correct** option.

Statement A: Warm and moist environment favours decomposition of detritus, whereas low temperature and anaerobiosis inhibit its decomposition, resulting in the build up of organic materials.

Statement B: The standing crop is measured as the mass of living organisms (biomass) or the number in a unit area.

- (1) Both the given statements are correct
- (2) Only statement A is correct
- (3) Both the given statements are incorrect
- (4) Only statements B is correct

122. Correctly match the types of ecological pyramids (Column I) with their food chains (Column II).

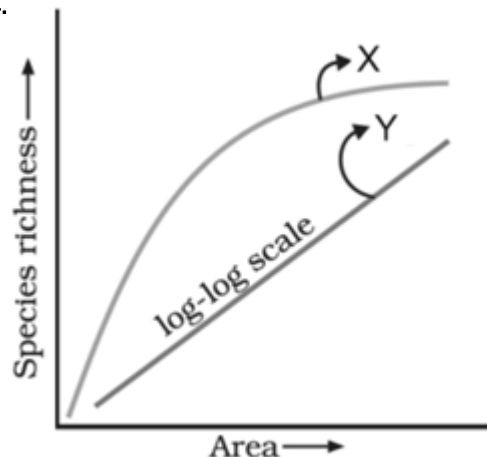
	Column I		Column II
a.	Inverted pyramid of biomass	(i)	Tree → Frugivorous birds → Falcon
b.	Upright pyramid of energy	(ii)	Phytoplankton → Small fishes → Large fishes
c.	Upright pyramid of biomass	(iii)	Grass → Grasshopper → Frog
d.	Spindle-shaped pyramid of number	(iv)	Tree → Insects → Sparrow

- (1) a(ii); b(iv); c(i), d(iii)
- (2) a(ii); b(iv); c(iii), d(i)
- (3) a(iv); b(iii); c(ii), d(i)
- (4) a(iii); b(i); c(ii), d(iv)

123. Given below are some statements. Consider these statements and select the option that is **true**.

- P. Speciation is generally a function of time.
 Q. Tropical latitudes have remained relatively undisturbed for millions of years.
 R. Productivity of tropical environments is higher than the temperate environments.
 S. There is more solar energy available in the tropics.
- (1) P and Q are true and Q is the correct reason for P
 - (2) Q and S are true and S is the correct reason for Q
 - (3) R and S are true and S is the correct reason for R
 - (4) P and R are true and P is the correct reason for R

124.



How many of the following statements is/are **correct** w.r.t the given graph.

- (a) This relation between species richness and area was given by the great British naturalist and geographer during his pioneering and extensive explorations in the South American jungles.
- (b) The relation between species richness and area for a wide variety of taxa turns out to be a curve shown by 'X'
- (c) For the latitudinal range of 23.5°N to 23.5° S, the steepness of curve 'Y' is more than the regions located at 71°N or 71°S w.r.t. bird species
- (d) The equation used for 'X' and 'Y' curves, respectively, are $S = CA^Z$ and $\log S = \log C + \log Z$.

- (1) One
- (2) Two
- (3) Three
- (4) Four

125. Match the following columns and select the **correct** option.

	Column I		Column II
a.	Insects	(i)	According to IUCN Red list, this group appears to be more vulnerable to extinction
b.	Reptiles	(ii)	This group makes up more than 70 percent of the total animals
c.	Birds	(iii)	378 species of this group are found in the tropical Amazonian rain forest
d.	Amphibians	(iv)	Nearly 1400 species of this group are present in Colombia

Choose the **correct** option.

- (1) a(iii); b(ii); c(i), d(iv)
- (2) a(iv); b(ii); c(iii), d(i)
- (3) a(ii); b(iii); c(iv), d(i)
- (4) a(ii); b(iv); c(iii), d(i)

126. Read the following statements and select the **correct** option.

Statement A: The fast-dwindling Amazon forest is estimated to produce, through photosynthesis, 20% of the total oxygen in the earth's atmosphere.

Statement B: The use of fruits or seeds by us, that are formed by the process of the fusion of male gamete with the egg cell, is considered as a broadly utilitarian service of ecosystem.

- (1) Both the statements are correct
- (2) Both the statement are incorrect
- (3) Only statements B is correct
- (4) Only statements A is correct

127. Certain events are mentioned below:
- The World Summit on sustainable development in Johannesburg.
 - The historical convention on Biological Diversity in Rio de Janeiro, held to call upon all nations, to take appropriate measure for conservation of biodiversity.
 - Documentation of extinction of 784 species in IUCN Red List.
 - IUCN described the total number of plants and animal species, that was slightly more than 1.5 million.
- Select the option that chronologically define the timeline of the above events.
- $b \rightarrow a \rightarrow c$
 - $a \rightarrow b \rightarrow c$
 - $d \rightarrow b \rightarrow c$
 - $d \rightarrow b \rightarrow a$
128. Select the **odd** one w.r.t. zonation in a terrestrial Biosphere Reserve.
- Transition zone is an area of active cooperation between reserve management and the local people.
 - Core zone comprises an undisturbed and legally protected ecosystem.
 - The buffer zone surrounds the transition zone and is managed to accommodate a greater research
 - Core zone is the innermost zone and also termed as the natural zone.
129. Read the following Assertion (A) and Reason (R) statements and select the **correct** option.
- Assertion (A):** Many nations find *in-situ* conservation unrealistic and economically not feasible to conserve all their biological wealth.
- Reason (R):** Invariably, the number of species waiting to be saved from extinction far exceeds the conservation resources available.
- Both (A) and (R) are true and (R) is the correct explanation of (A)
 - Both (A) and (R) are true but (R) is not the correct explanation of (A)
 - (A) is true but (R) is false
 - Both (A) and (R) are false

136. *Limulus* is an example of living fossil belonging to the phylum
- Arthropoda
 - Mollusca
 - Annelida
 - Hemichordata
137. Complete the analogy by selecting **correct** option.
Internal fertilization : *Culex* :: External fertilization : _____
- Fasciola*
 - Wuchereria*
 - Euspongia*
 - Ctenoplana*
138. All of the salient features of different phyla in the animal kingdom presented in the below given table are generally correct, **except**

	Phylum	Level of organisation	Digestive system	Feature
(1)	Echinodermata	Organ-system	Incomplete	Water vascular system
(2)	Chordata	Organ-system	Complete	Dorsal nerve cord
(3)	Platyhelminthes	Organ level	Incomplete	Flame cells
(4)	Aschelminthes	Organ-system	Complete	Pseudocoelom

- (1)
- (2)
- (3)
- (4)

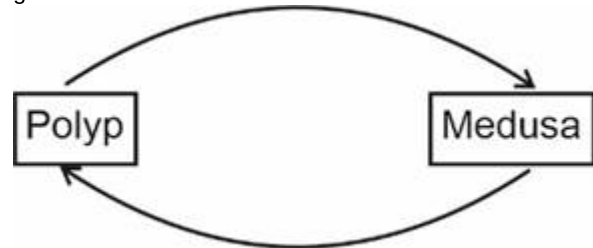
130. *Eichhornia* led to the decline of the indigenous plants in India because
- It requires low area and O_2 for photosynthesis which was provided by aquatic indigenous plants.
 - In the absence of its natural predator, it grows rapidly, competing for resources.
 - Indigenous species created the favourable environment for it
 - It turned invasive and killed its predators
131. Biodiversity hotspots differ from sacred groves, as the
- Former is protected but latter is not
 - Latter has special religious importance to a particular culture
 - Former is a conserved area but latter is not
 - Former has endemic species
 - Latter are conserved through *in-situ* conservation while the former is conserved by *ex-situ* conservation.
- The **correct** one(s) is/are
- Only (b)
 - Only (a) and (b)
 - Only (a), (c) and (e)
 - Only (b), (d) and (e)
132. Select the **incorrectly** matched pair.
- Detritus – Detritivores act over it
 - Fungi – Degrade detritus into simpler inorganic substances
 - Converter – Converts the plant matter into animal matter
 - Transducer – Converts the sunlight energy into chemical energy
133. Select the **odd** one w.r.t. terrestrial ecosystem
- Estuary
 - Grassland
 - Forest
 - Desert
134. Select the **incorrect** one for anthropogenic ecosystem.
- Does not possess self-regulatory mechanism
 - Has little species diversity
 - Considered as stable as natural ecosystem
 - Shows high productivity
135. A total of how many biodiversity hotspots have been identified globally?
- 20
 - 3
 - 34
 - 50

ZOOLOGY

139. Consider the following statements.
- Pharynx is perforated by gill slits in all the members of phylum Chordata from embryonic to adult stages.
 - In all chordates, notochord is replaced by a cartilaginous or bony vertebral column.
 - Central nervous system is hollow and dorsal.
 - In all vertebrates, heart is dorsal and associated with systemic and pulmonary circulation.
 - All vertebrates are chordates.
- Choose the most appropriate answer from the options given below representing only the **incorrect** statements about chordates.
- a, b and c only
 - c and e only
 - a, b and d only
 - b, c and e only
140. All of the following are poikilotherms possessing cornified skin and epidermal scales, **except**
- Chelone*
 - Corvus*
 - Chameleon*
 - Calotes*

141. Which of the following statements are not true about sharks?
 a. Their skin is tough and covered with placoid scales.
 b. They possess a swim bladder which regulates buoyancy.
 c. Their tail is heterocercal.
 d. They possess two-chambered heart.
 e. They have five pairs of gill slits covered by operculum.
 Choose the correct option.
 (1) a, c, d, e (2) b, c, d, e
 (3) b and e (4) c and e
142. The animals included in the largest phylum of the kingdom Animalia have
 (1) Only two germ layers
 (2) Nephridia as their excretory structures
 (3) A segmented body
 (4) Closed circulatory system
143. Mantle cavity is the space between
 (1) Shell and mantle
 (2) Mantle and visceral hump
 (3) Visceral hump and muscular foot
 (4) Mantle and head
144. All of the following statements are correct for poriferans, **except**
 (1) Eggs and sperms are produced by the same individual
 (2) They are generally marine and mostly asymmetrical animals
 (3) They reproduce sexually as well as asexually
 (4) They exhibit extracellular type of digestion
145. *Meandrina* belongs to a group of animals which are best described as
 (1) Unicellular with tissue level of organisation
 (2) Multicellular with radially symmetrical body
 (3) Multicellular with organ level of organisation
 (4) Unicellular with bilaterally symmetrical bodies
146. Read the following carefully
 (a) They show external fertilisation and direct development
 (b) They have moist skin without scales
 (c) Body is divided into head and trunk
 (d) The eyes have eyelids
 Which of the above given statements are correct for frogs?
 (1) b, c and d (2) a, b and c
 (3) a and c only (4) a, b and d
147. The scaly hindlimbs of birds are modified for performing all of the given functions, **except**
 (1) Walking
 (2) Flying
 (3) Swimming
 (4) Clasping the tree branches
148. Which one of the following statements about certain given animals is **incorrect**?
 (1) *Struthio* is a flightless bird.
 (2) *Platypus* is an oviparous mammal.
 (3) Snakes do not have external ear opening.
 (4) Cutaneous respiration occurs in *Carcharodon*.
149. The **correct** classification of *Myxine* is
 (1) Chordata → Vertebrata → Agnatha → Cyclostomata
 (2) Chordata → Acraniata → Protochordata → Cephalochordata
 (3) Chordata → Cephalochordata → Cyclostomata
 (4) Chordata → Tunicata → Vertebrata → Tetrapoda

150. Which of the following statements is **incorrect** about the members of the phylum Annelida?
 (1) They are triploblastic, metamerically segmented coelomate animals
 (2) They possess both longitudinal and circular muscles which help in locomotion
 (3) A closed circulatory system is present
 (4) All are monoecious and reproduction is sexual in them
151. Sea cucumber and sea urchin differ from sea pen and sea fan w.r.t. all the given characters, **except**
 (1) Presence of coelomic cavity
 (2) Marine habitat
 (3) Symmetry of larval form
 (4) Complete digestive system
152. Consider the following.
 (a) Possesses organ system level of organization
 (b) Pseudocoelomate
 (c) Dioecious
 The above mentioned features are true for
 (1) Earthworm (2) Tapeworm
 (3) Silk worm (4) Hookworm
153. Which of the following features is common to *Balanoglossus*, *Anopheles* and *Laccifer*?
 (1) Marine habitat
 (2) Members of the largest phylum of the animal kingdom
 (3) Presence of an open circulatory system
 (4) External fertilisation
154. Select the **odd** member w.r.t. the phylum Coelenterata.
 (1) Sea-pen (2) Sea-anemone
 (3) Sea-hare (4) Sea-fan
155. Presence of which character is mainly responsible for diversification of insects on land?
 (1) Simple eyes (2) Pseudometamerism
 (3) Chitinous exoskeleton (4) Bilateral symmetry
156. Exclusively marine animals with worm-like body and stomochord have
 (1) Closed circulatory system
 (2) Open circulatory system
 (3) Incomplete digestive system
 (4) Endoskeleton of calcareous ossicles
157. Observe the schematic representation of life cycle of *Obelia* given below.



- Select the **incorrect** option w.r.t. it.
 (1) Polyps produce medusae asexually
 (2) This sort of alternation of generation of body forms is feature of some cnidarians
 (3) Polyp is umbrella-shaped and free-swimming form
 (4) Medusa, the umbrella-shaped body form, produces the polyp sexually
158. Which of the following options represents the correct pair of animals that have open and closed type of circulatory system, respectively?
 (1) *Pila*, *Pristis* (2) *Pila*, *Pinctada*
 (3) *Sepia*, *Bombyx* (4) *Dentalium*, *Chaetopleura*

159. Malpighian tubules of arthropods are functionally similar to
 (1) Trachea of insects (2) Book gills of prawns
 (3) Nephridia of annelids (4) Gills of hemichordates

160. Choose the option representing the correct combination of features present in *Aurelia*.

- (1) Cellular level of organisation, diploblastic, radial
 (2) Tissue level of organisation, triploblastic, radial
 (3) Organ level of organisation, triploblastic, bilateral
 (4) Tissue level of organisation, diploblastic, radial

161. Which of the following is **not incorrect** w.r.t. ctenophores?

- (1) They possess eight pairs of comb plates on their external body surface
 (2) They do not possess statocyst
 (3) They do not have nematocysts
 (4) They are dioecious and show indirect development via a free-swimming larva

162. Read statements A and B and select the **correct** option.

Statement A: All vertebrates possess a closed circulatory system but all chordates do not.

Statement B: All vertebrates bear jaw, but all true fishes do not.

- (1) Both the statements A and B are correct
 (2) Both the statements A and B are incorrect
 (3) Only statement A is incorrect
 (4) Only statement B is incorrect

163. **Assertion (A):** Reptiles exhibit incomplete double circulation.

Reason (R): Their ventricles are incompletely divided and receive mixed blood from the atria.

In the light of above statements, select the **correct** option.

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

164. Match column I with column II w.r.t. animal class and features of their members.

	Column I		Column II
a.	Amphibia	(i)	Only one pair of walking limbs, air sacs present
b.	Reptilia	(ii)	Cutaneous respiration in addition to pulmonary respiration
c.	Aves	(iii)	Diaphragm and only pulmonary respiration
d.	Mammalia	(iv)	Tympanum represents ear

Choose the **correct** option.

- (1) a(iv); b(ii); c(iii), d(i) (2) a(ii); b(iv); c(i), d(iii)
 (3) a(ii); b(i); c(iv), d(iii) (4) a(iii); b(ii); c(i), d(iv)

165. Which of the following pairs correctly represents an animal with its exclusive feature?

- (1) *Ascaris* – Flame cells for excretion
 (2) *Nereis* – Parapodia for locomotion
 (3) *Euspongia* – Water vascular system
 (4) *Asterias* – Green gland for excretion

166. Select the option representing the **correct** trend w.r.t. the body organisation across the kingdom Animalia from complex to simple forms.

- (1) Porifera → Cnidaria → Platyhelminthes → Annelida → Arthropoda → Mollusca → Echinodermata → Chordata
 (2) Porifera → Cnidaria → Platyhelminthes → Annelida → Mollusca → Arthropoda → Echinodermata → Chordata
 (3) Chordata → Echinodermata → Mollusca → Arthropoda → Annelida → Platyhelminthes → Cnidaria → Porifera
 (4) Chordata → Mollusca → Echinodermata → Arthropoda → Annelida → Platyhelminthes → Cnidaria → Porifera

167. Presence of which of the following features **correctly** differentiates hemichordates from true chordates?

- (1) Bilateral symmetry in latter
 (2) True coelom
 (3) Dorsal heart in former
 (4) Triploblastic condition

168. Select the **incorrect** match.

- (1) Aschelminths – Unsegmented body
 (2) Coelenterates – Cnidocytes present
 (3) Porifers – Ostia and osculum present
 (4) Platyhelminths – Body cavity lined by mesoderm

169. Observe the given diagram and select the **incorrect** option w.r.t. it.



- (1) Shows anadromous migration
 (2) Possesses cartilaginous cranium and vertebral column
 (3) Devoid of scales and unpaired fins
 (4) Circulation is of closed type

170. Which of the following options represents the progressive advancement w.r.t. respiration among chordates?

- (1) Gills → Lungs → Trachea
 (2) Gills → Skin → Lungs
 (3) Skin → Gills → Lungs
 (4) Skin → Lungs → Gills

171. **Assertion (A):** There is a transition from radial to bilateral symmetry across the animal kingdom.

Reason (R): Evolution favoured increase in specialisation from directional mobility to sedentary or passive lifestyle.

In the light of above statements, choose the **correct** option.

- (1) Both (A) and (R) are true and (R) explains (A) correctly
 (2) Both (A) and (R) are true but (R) does not explain (A) correctly
 (3) (A) is true but (R) is false
 (4) (A) is false but (R) is true

172. In chordates, the notochord is located

- (1) Dorsal to nerve cord and ventral to gut
 (2) Dorsal to gut and ventral to nerve cord
 (3) Ventral to both gut and nerve cord
 (4) Dorsal to both nerve cord and gut

173. Diploblastic animals lack

- (1) Mesoglea and bilateral symmetry
 (2) Mesoderm and radial symmetry
 (3) Mesoderm and bilateral symmetry
 (4) Mesoglea and radial symmetry

17/03/2026

Code-B



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MM : 720

Final Test Series(P1)_NEET2026_Test-01B

Time : 180 Min.

PHYSICS

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| 1. (3) | 24. (2) |
| 2. (1) | 25. (2) |
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| 4. (2) | 27. (3) |
| 5. (2) | 28. (1) |
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| 22. (1) | 45. (3) |
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CHEMISTRY

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| 46. (2) | 69. (3) |
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| 47. (2) | 70. (2) |
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| 65. (2) | 88. (2) |
| 66. (1) | 89. (2) |
| 67. (2) | 90. (2) |
| 68. (4) | |



BOTANY

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|----------|----------|
| 91. (1) | 114. (3) |
| 92. (3) | 115. (3) |
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| 94. (2) | 117. (2) |
| 95. (3) | 118. (2) |
| 96. (4) | 119. (4) |
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| 98. (1) | 121. (1) |
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ZOOLOGY

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- 177. (3)
- 178. (2)
- 179. (3)

157. (3)

180. (2)

158. (1)

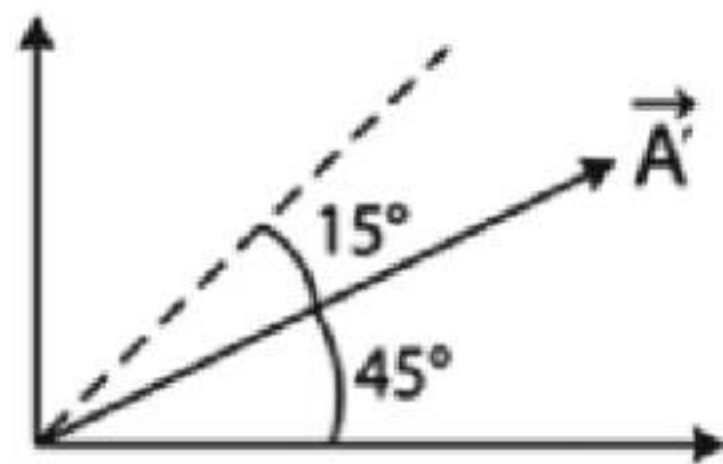
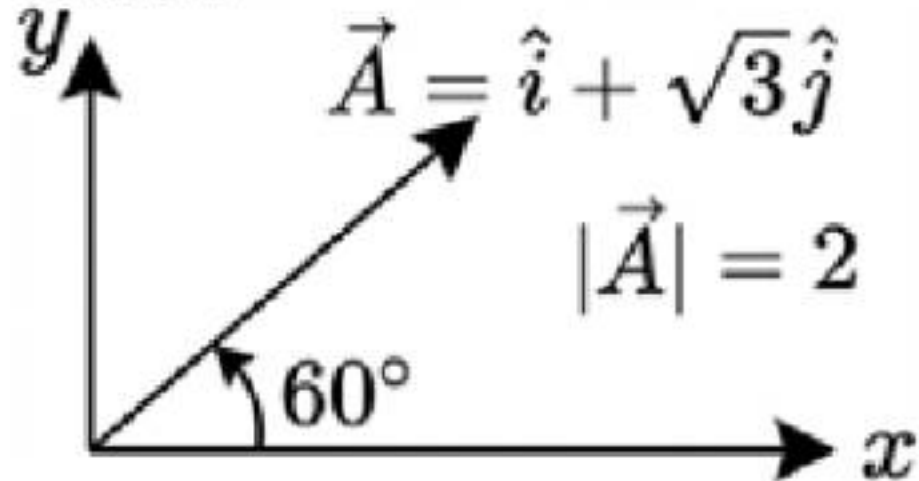


Hints and Solutions

PHYSICS

(1) Answer : (3)

Solution:



$$A_x = 2 \cos 45^\circ$$

$$A_y = 2 \sin 45^\circ$$

$$\text{New vector } \vec{A}' = \frac{2}{\sqrt{2}}\hat{i} + \frac{2}{\sqrt{2}}\hat{j} = \sqrt{2}\hat{i} + \sqrt{2}\hat{j}.$$

$$\frac{\vec{A}'}{|\vec{A}'|} = \hat{A} = \frac{\sqrt{2}\hat{i} + \sqrt{2}\hat{j}}{2} = \frac{1}{\sqrt{2}}\hat{i} + \frac{1}{\sqrt{2}}\hat{j}.$$

(2) Answer : (1)

Solution:

$$\frac{dy}{dx} = 2x + 3 = 0$$

$$\Rightarrow x = -\frac{3}{2}$$

(3) Answer : (4)

Solution:

$$\text{Stopping distance} = \frac{u^2}{2a} = \frac{(20)^2}{2 \times 5} = 40 \text{ m}$$

(4) Answer : (2)

Solution:

$$\tan \theta = \frac{A_y}{A_x}$$

$$\text{Step-1: } \tan \theta = \frac{8}{7}$$

$$\theta = \tan^{-1}\left(\frac{8}{7}\right)$$

(5) Answer : (2)

Solution:

$$\text{LC} = 1 \text{ MSD} - 1 \text{ VSD}$$

$$50 \text{ VSD} = 48 \text{ MSD}$$

$$\text{So, } 1 \text{ VSD} = \frac{48}{50} = \frac{24}{25} \text{ MSD}$$

Now,

$$\text{Least count} = 1 \text{ MSD} - 1 \text{ VSD}$$

$$= 1 \text{ MSD} - \frac{24}{25} \text{ MSD}$$

$$= \frac{1}{25} \text{ MSD} = \frac{1}{25} \times 0.5 \text{ mm}$$

$$= 0.02 \text{ mm}$$


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(6) Answer : (3)**Hint:**In uniform circular motion, $\omega = \frac{2\pi}{T}$ **Solution:**

Since time period is same for both

$$\therefore \omega_1 = \omega_2$$

(7) Answer : (2)**Hint:**

$$y = x \tan \theta \left(1 - \frac{x}{R}\right)$$

Solution:

Since trajectory of a projectile in x-y plane is given by

$$y = x \tan \theta \left(1 - \frac{x}{R}\right)$$

$$5 = 4 \tan \theta \left(1 - \frac{4}{R}\right) \dots (i)$$

$$4 = 5 \tan \theta \left(1 - \frac{5}{R}\right) \dots (ii)$$

$$\frac{5}{4} = \frac{4}{5} \frac{(R-4)}{(R-5)}$$

$$\frac{25}{16} = \frac{R-4}{R-5}$$

$$25R - 125 = 16R - 64$$

$$9R = 61$$

$$R = \frac{61}{9} \text{ m}$$

(8) Answer : (3)**Solution:**

$$\text{Speed } v = \sqrt{v_x^2 + v_y^2}$$

$$v^2 = v_x^2 + v_y^2$$

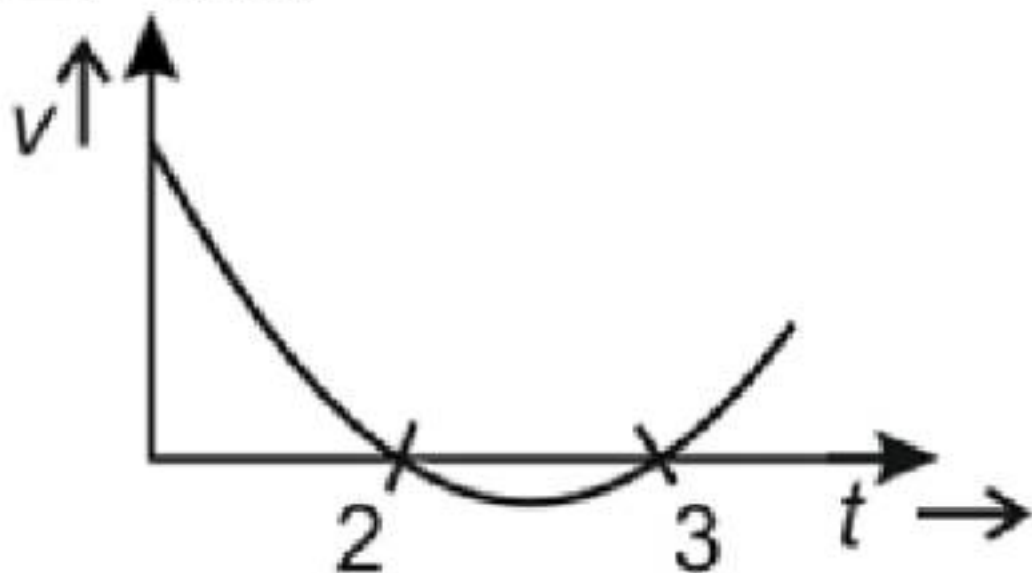
$$2v \frac{dv}{dt} = 2v_x \frac{dv_x}{dt} + 2v_y \frac{dv_y}{dt}$$

$$\frac{dv}{dt} = \frac{v_x a_x + v_y a_y}{v} = \frac{\vec{v} \cdot \vec{a}}{v}$$

i.e. component of \vec{a} parallel to \vec{v} **(9) Answer : (4)****Solution:**

$$x = \frac{t^3}{3} - \frac{5t^2}{2} + 6t + 2$$

$$V = t^2 - 5t + 6$$



$$t^2 - 5t + 6 = 0 \Rightarrow t = 2, 3$$

Velocity-time graph is upward parabola.

(10) Answer : (4)**Solution:**

Precision is related to least count.

(11) Answer : (1)**Solution:**

$$T = \text{Total distance} / \text{Speed}$$

$$= 1000 / 25$$

$$= 40 \text{ s}$$


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(12) Answer : (2)

Solution:

$$\sigma = \frac{F}{\pi r^2}$$

Maximum percentage error in σ ($\% \sigma$) = $1 \times \%F + 2 \times \%r$

$$\%F = \frac{0.005}{5} \times 100 = 0.1\%$$

$$\%r = \frac{0.01}{2} \times 100 = 0.5\%$$

$$\therefore \%P = 0.1 + 2(0.5) = 1.1\%$$

(13) Answer : (4)

Solution:

$$x = 4 + 3t + 6t^2$$

$$v = \frac{dx}{dt} = 3 + 12t$$

$$\text{at } t = 1 \text{ s, } v = 15 \text{ m/s}$$

(14) Answer : (1)

Solution:

Equation of straight line

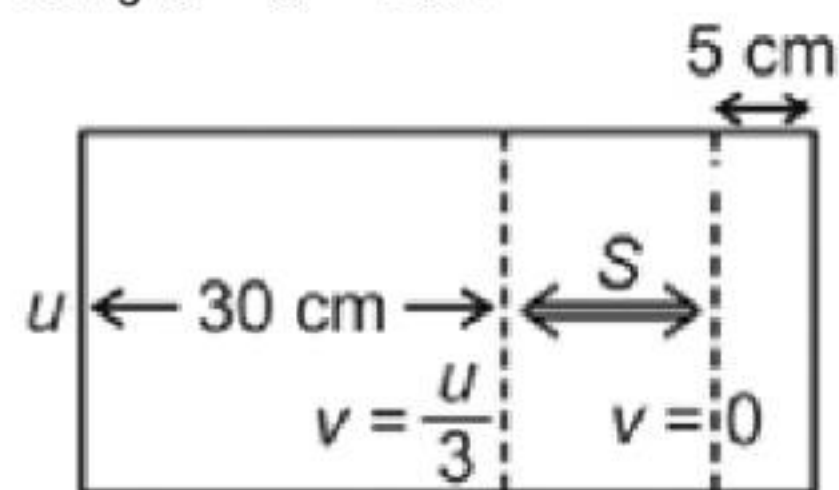
$$y = mx + c$$

Here $m = 1$ and $c = 2$

$$\therefore y = x + 2$$

(15) Answer : (2)

Solution:

Using $v^2 - u^2 = 2aS$.

$$\frac{u^2}{9} - u^2 = 2a(30) \quad \dots (1)$$

$$0 - \frac{u^2}{9} = 2a(S) \quad \dots (2)$$

$$-\frac{8u^2}{9} = 30$$

$$-\frac{u^2}{9} = S$$

$$\Rightarrow S = \frac{30}{8} = 3.75$$

$$\therefore \text{Total length of the block} = 30 + 3.75 + 5 = 38.75 \text{ cm}$$

(16) Answer : (4)

Solution:

$$\text{Surface tension} = \frac{\text{Force}}{\text{Length}}$$

(17) Answer : (4)

Solution:

$$R_{\max} = A + B = 7$$

$$R_{\min} = |A - B| = 1$$

$$R_{\min} \leq R \leq R_{\max}$$

(18) Answer : (4)

Solution:

$$\text{Angular momentum, } L = \frac{n\hbar}{2\pi}$$

 \therefore Unit of angular momentum (L) is same as Planck's constant.

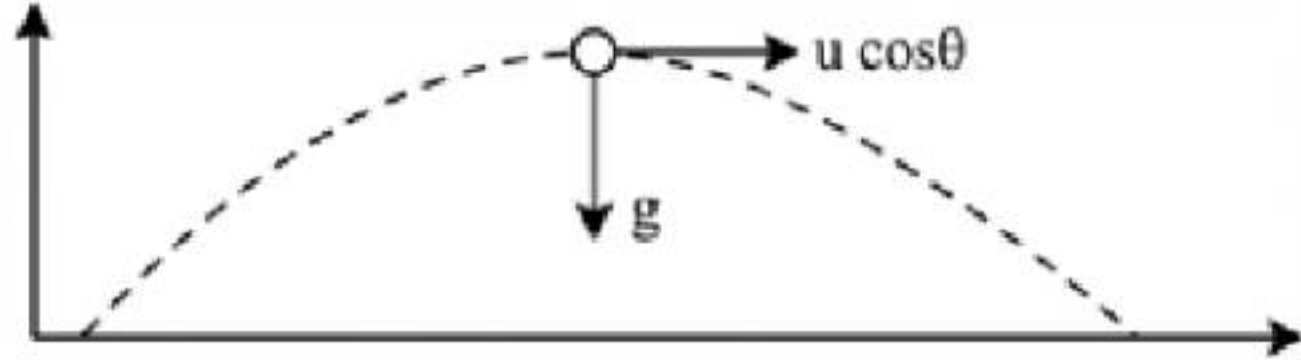
$$E = hf \Rightarrow h = \frac{E}{f}$$

 \therefore Unit of $\frac{\text{Energy}}{\text{Frequency}}$ is same as Planck's constant.


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(19) Answer : (3)

Solution:



$$r = \frac{u^2 \cos^2 \theta}{g} = \frac{(u \cos \theta)^2}{g} = \frac{a^2}{g}$$

(20) Answer : (3)

Solution:

 If $a_x \neq 0$, v_x will change

 If $a_y \neq 0$, v_y will change

(21) Answer : (4)

Solution:

Distance travelled in last second $s_{n^{\text{th}}} = u + \frac{a}{2}(2n-1)$, hence distance travelled in last second of the journey depends on initial speed also.

Distance covered in last second of upward journey before coming to rest = $\frac{1}{2}g(1)^2 = \frac{g}{2}$.

(22) Answer : (1)

Hint:

$$\text{L.C. of screw gauge} = \frac{\text{Pitch}}{\text{Number of divisions on circular scale}}$$

Solution:

$$\text{L.C. of screw gauge} = \frac{1 \text{ mm}}{100} = 0.01 \text{ mm}$$

(23) Answer : (4)

Solution:

If velocity of particle is u at point of projection then

At the highest point velocity is $= u \cos \theta$

$$= u \cos 60^\circ$$

$$= \frac{u}{2}$$

(24) Answer : (2)

Solution:

$$|\vec{P} + \vec{Q}| = |\vec{R}| \Rightarrow R^2 = P^2 + Q^2 + 2PQ \cos \theta \quad \dots (1)$$

$$|\vec{P} + 2\vec{Q}| = 2|\vec{P} + \vec{Q}| \Rightarrow 4R^2 = P^2 + 4Q^2 + 4PQ \cos \theta \quad \dots (2)$$

$$|\vec{P} - \vec{Q}| = 2|\vec{P} + \vec{Q}| \Rightarrow 4R^2 = P^2 + Q^2 - 2PQ \cos \theta \quad \dots (3)$$

Solving (1) and (3)

$$R^2 = P^2 + Q^2 + 2PQ \cos \theta$$

$$4R^2 = P^2 + Q^2 - 2PQ \cos \theta$$

$$5R^2 = 2P^2 + 2Q^2 \quad \dots (4)$$

Solving (2) and (3)

$$4R^2 = P^2 + 4Q^2 + 4PQ \cos \theta$$

$$8R^2 = 2P^2 + 2Q^2 - 4PQ \cos \theta$$

$$12R^2 = 3P^2 + 6Q^2$$

$$4R^2 = P^2 + 2Q^2 \quad \dots (5)$$

Solving (4) and (5)

$$R^2 = P^2$$

$$R^2 = \frac{2}{3}Q^2$$

$$P^2 = \frac{2}{3}Q^2$$

$$\therefore P : Q : R$$

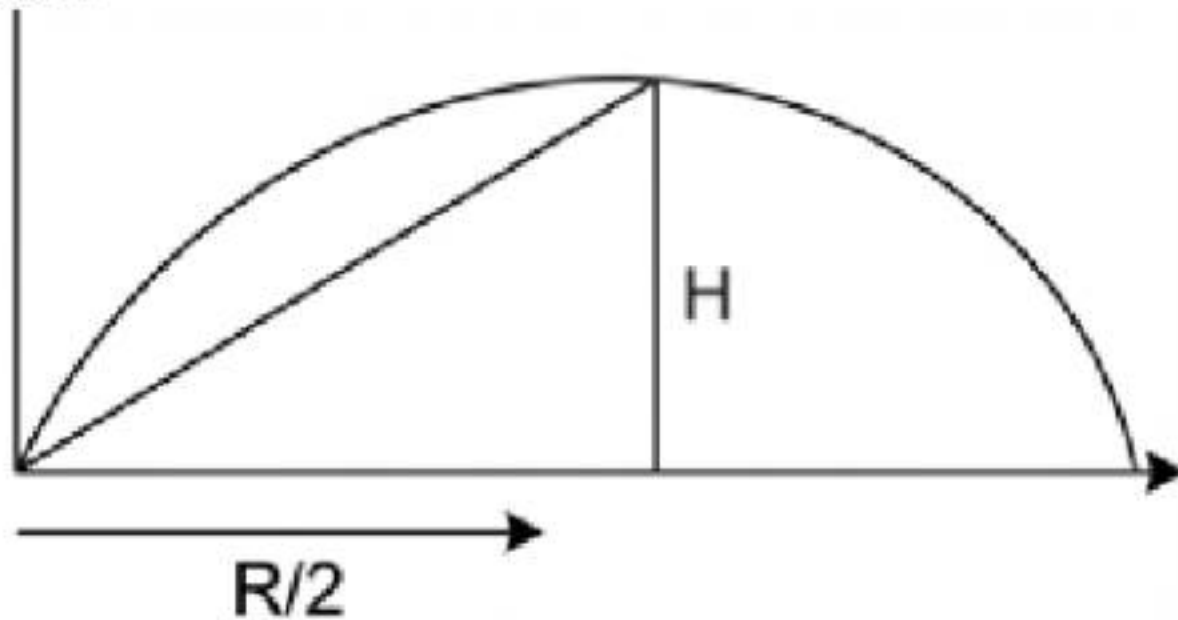
$$\sqrt{2} : \sqrt{3} : \sqrt{2}$$

(25) Answer : (2)
Solution:

$$V_{(avg)} = \frac{\text{distance}}{\text{time}}$$

$$= \frac{40+40}{15} = \frac{80}{15} = 5.33 \text{ m/s}$$

(26) Answer : (3)
Solution:



$$\text{Average velocity} = \frac{\text{displacement}}{\text{time}}$$

$$= \frac{\sqrt{H^2 + \frac{R^2}{4}}}{T/2}$$

$$H = \frac{v^2 \sin^2 \theta}{2g}, \quad R = \frac{v^2 2 \sin \theta \cos \theta}{g}$$

$$\rightarrow T = \frac{2v \sin \theta}{g}$$

$$= \frac{\sqrt{\left(\frac{v^2 \sin^2 \theta}{2g}\right)^2 + \frac{1}{4} \left(\frac{v^2 2 \sin \theta \cos \theta}{g}\right)^2}}{\frac{v \sin \theta}{g}}$$

$$= \frac{\sqrt{\frac{v^4 \sin^4 \theta}{4g^2} + \frac{4v^4 \sin^2 \theta \cos^2 \theta}{4g^2}}}{\frac{v \sin \theta}{g}}$$

$$= \frac{\sqrt{\frac{v^4 \sin^2 \theta}{4g^2} (\sin^2 \theta + 4 \cos^2 \theta)}}{\frac{v \sin \theta}{g}}$$

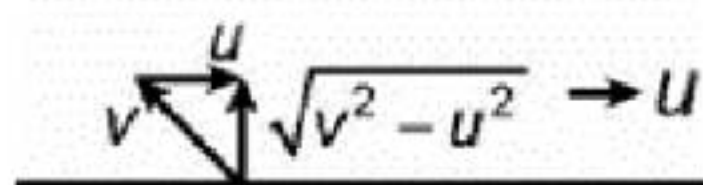
$$= \frac{\frac{v^2 \sin \theta}{2g} \sqrt{\sin^2 \theta + \cos^2 \theta + 3 \cos^2 \theta}}{\frac{v \sin \theta}{g}}$$

$$= \frac{v}{2} \sqrt{1 + 3 \cos^2 \theta}$$

(27) Answer : (3)
Solution:

Let velocity of man in still water be v and that of water with respect to ground be u .

Velocity of man perpendicular to river flow with respect to ground = $\sqrt{v^2 - u^2}$



Velocity of man downstream = $v + u$

As given, $\sqrt{v^2 - u^2} t = (v + u) T$

$$\Rightarrow (v^2 - u^2)t^2 = (v + u)^2 T^2$$

$$\Rightarrow (v - u)t^2 = (v + u)T^2$$

$$\therefore \frac{v}{u} = \frac{t^2 + T^2}{t^2 - T^2}$$

(28) Answer : (1)



Solution:

$$y = x - x^2$$

$$y = x[1 - x]$$

On comparing it with $y = x \tan \theta \left[1 - \frac{x}{R}\right]$

$$\theta = 45^\circ$$

$$R = 1$$

$$\text{Also } y = x \tan \theta - \frac{1}{2} \frac{gx^2}{u^2 \cos^2 \theta}$$

$$y = x - \frac{5}{u^2} x^2$$

$$\frac{u^2}{5} = 1 \Rightarrow u_x = \sqrt{5}$$

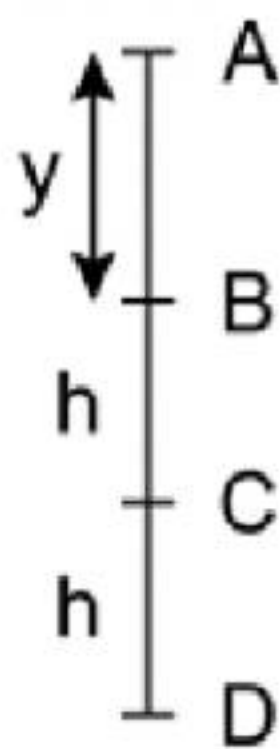
$$u \cos 45^\circ = \sqrt{5} \quad \therefore u = \sqrt{10} = 3.16 \text{ m/s}$$

$$T = \frac{2u \sin \theta}{g} = 2 \times \frac{\sqrt{10}}{10} \times \frac{1}{\sqrt{2}} = \sqrt{\frac{2}{10}} = \sqrt{0.2} = 0.447 \text{ s}$$

$$H = \frac{u^2 \sin^2 \theta}{2g} = \frac{10}{2 \times 10} \times \frac{1}{2} = \frac{1}{4} = 0.25 \text{ m}$$

(29) Answer : (1)**Solution:**

Trailing zero(s) in a number with a decimal point are significant.

(30) Answer : (2)**Solution:**

$$\text{Let } AB = y$$

$$BC = CD = h$$

$$t_{AB} = t$$

$$y = \frac{1}{2}gt^2 \quad \dots (1)$$

$$y + h = \frac{1}{2}g(t+2)^2 \quad \dots (2)$$

$$y + 2h = \frac{1}{2}g(t+3)^2 \quad \dots (3)$$

solving (1) and (2)

$$h = \frac{g}{2}[4 + 4t] \quad \dots (4)$$

solving (2) and (3)

$$h = \frac{g}{2}[5 + 2t] \quad \dots (5)$$

Solving (4) and (5)

$$4 + 4t = 5 + 2t$$


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$$2t = 1$$

$$t = 0.5 \text{ s}$$

(31) Answer : (4)

Solution:

$$F = A^2$$

$$MLT^{-2} = A^2$$

$$\therefore A = M^{1/2} L^{1/2} T^{-1}$$

$\sqrt{B}x$ and ct are dimensionless.

$$\frac{\sqrt{B}}{c} = \frac{t}{x} = L^{-1}T^1$$

$$B = L^{-2}$$

$$c = T^{-1}$$

(32) Answer : (1)

Solution:

(1) Force = $\rho^a f^b V^c$

$$MLT^{-2} = (ML^{-3})^a (T^{-1})^b (LT^{-1})^c$$

Solving, we get $a = 1, b = -2, c = 4$

$$\therefore [\text{Force}] = \rho^1 f^{-2} V^4$$

2. Angular momentum

$$ML^2T^{-1} = (ML^{-3})^a (T^{-1})^b (LT^{-1})^c$$

Solving, we get $a = 1, b = -4, c = 5$

$$[\text{Angular momentum}] = [\rho^1 f^{-4} V^5]$$

3. Mass

$$ML^0T^0 = (ML^{-3})^a (T^{-1})^b (LT^{-1})^c$$

$a = 1, b = -3, c = 3$

$$[\text{Mass}] = [\rho^1 f^{-3} V^3]$$

4. Length

$$M^0L^1T^0 = (ML^{-3})^a (T^{-1})^b (LT^{-1})^c$$

$a = 0, b = -1, c = 1$

$$[\text{Length}] = [\rho^0 f^{-1} V^1]$$

(33) Answer : (1)

Solution:

$$\therefore l^2 = A \Rightarrow l = \sqrt{A} = 10 \text{ m}$$

$$\Rightarrow \frac{\Delta l}{l} = \frac{1}{2} \frac{\Delta A}{A} \Rightarrow \Delta l = \frac{l \Delta A}{2A} = \frac{0.4 \times 10}{2 \times 100} = 0.02 \text{ m}$$

$$\therefore \text{side} = (10 \pm 0.02) \text{ m}$$

(34) Answer : (2)

Solution:

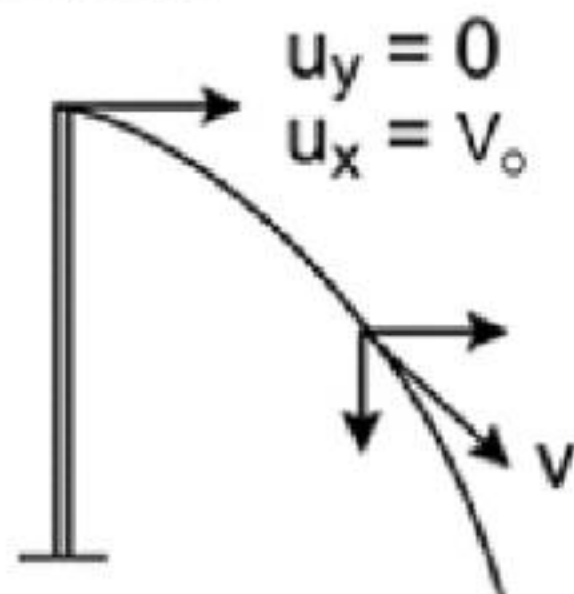
$$6.03587$$

odd (increment it by 1)

$$6.04$$

(35) Answer : (3)

Solution:



$$S_x = S_y$$


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$$u_x t = \frac{1}{2} g t^2.$$

$$V_0 t = \frac{1}{2} g t^2.$$

$$t = \frac{2V_0}{g}.$$

After time t , $V_x = V_0$.

$$V_y = g t = g \frac{2V_0}{g} = 2V_0.$$

$$\therefore \text{Speed} = \sqrt{V_x^2 + V_y^2} = \sqrt{V_0^2 + (2V_0)^2} = \sqrt{5}V_0.$$

(36) Answer : (2)

Solution:

$$\tan \theta = \frac{u_y}{u_x} = \sqrt{3}, \theta = 60^\circ.$$

$$R = \frac{2u_x u_y}{g} = \frac{2 \times (1) \times \sqrt{3}}{10} = \frac{\sqrt{3}}{5}$$

Equation of trajectory is

$$y = x \tan \theta \left[1 - \frac{x}{R} \right]$$

$$y = x \sqrt{3} \left[1 - \frac{5x}{\sqrt{3}} \right]$$

$$y = \sqrt{3}x - 5x^2$$

(37) Answer : (4)

Solution:

The angle is 90° for uniform circular motion only. For circular motions with increasing and decreasing speeds, the angle is acute and obtuse respectively.

(38) Answer : (1)

Solution:

If a particle has non-zero acceleration, its velocity has to vary either in magnitude or in direction or in both. Acceleration is defined as rate of change of velocity.

(39) Answer : (1)

Solution:

According to principle of homogeneity, $[A] = [B] = [C]$.

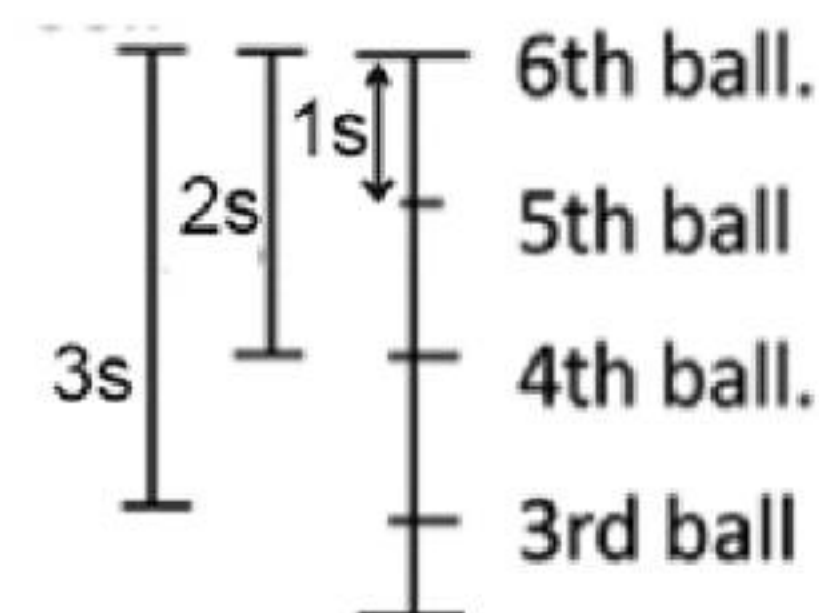
(40) Answer : (4)

Solution:

In 4 minutes 10 seconds, boy will complete 5 revolutions. Therefore displacement will be zero.

(41) Answer : (3)

Solution:



For 5th ball; it was dropped for just one second before.

$$\therefore \text{distance fallen} = \frac{1}{2} g t^2 = \frac{1}{2} \times 10 \times 1^2 = 5 \text{ m.}$$

For 4th ball, it was dropped for two second before

$$\therefore \text{distance fallen} = \frac{1}{2} \times 10 \times 2^2 = 20 \text{ m}$$

$$\text{For 3rd ball, distance fallen} = \frac{1}{2} \times 10 \times 3^2 = 45 \text{ m}$$

\therefore Required ratio of positions of 3rd : 4th : 5th balls.

$$45 : 20 : 5$$

$$9 : 4 : 1$$

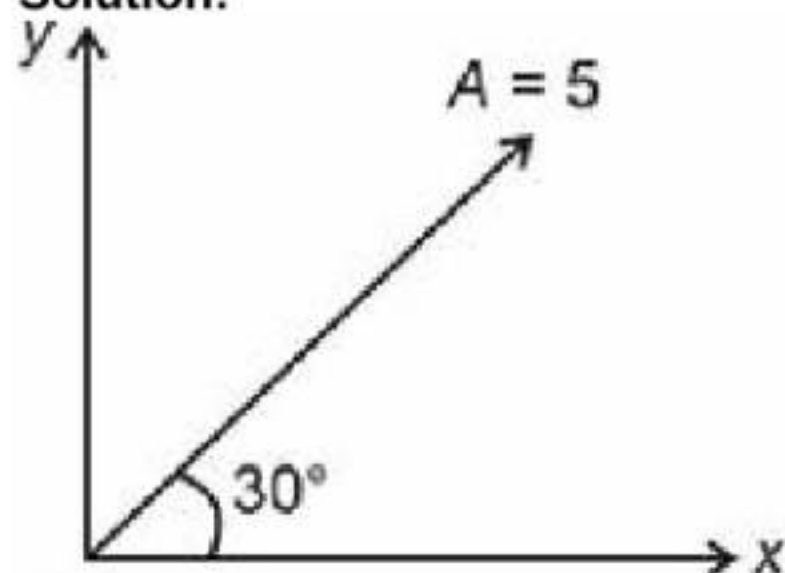
(42) Answer : (2)

Hint:

$$\vec{A} = A_x \hat{i} + A_y \hat{j}$$

$$= A \cos \theta \hat{i} + A \sin \theta \hat{j}$$

Solution:

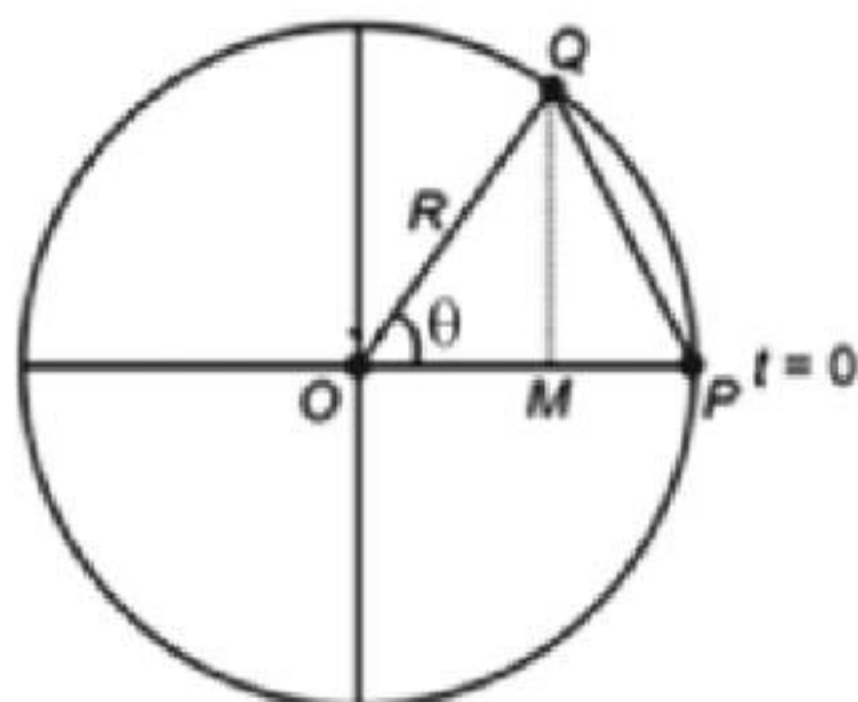


$$A_x = 5 \cos 30^\circ = 5 \frac{\sqrt{3}}{2} \text{ m}$$

$$A_y = 5 \sin 30^\circ = \frac{5}{2} \text{ m}$$

(43) Answer : (3)

Solution:



In time t , particle has rotated an angle $\theta = \omega t$.

$$\therefore \text{Displacement } PQ = \sqrt{QM^2 + PM^2}$$

$$QM = R \sin \theta = R \sin \omega t$$

$$PM = OP - OM$$

$$= R - R \cos \theta = R(1 - \cos \omega t)$$

$$\therefore PQ = \sqrt{(R \sin \omega t)^2 + R^2(1 - \cos \omega t)^2}$$

$$PQ = \sqrt{R^2 \sin^2 \omega t + R^2 + R^2 \cos^2 \omega t - 2R^2 \cos \omega t}$$

$$= \sqrt{2R^2(1 - \cos \omega t)}$$

$$= \sqrt{2R^2 \cdot 2 \cdot \sin^2 \frac{\omega t}{2}}$$

$$= 2R \sin \frac{\omega t}{2}$$

(44) Answer : (2)

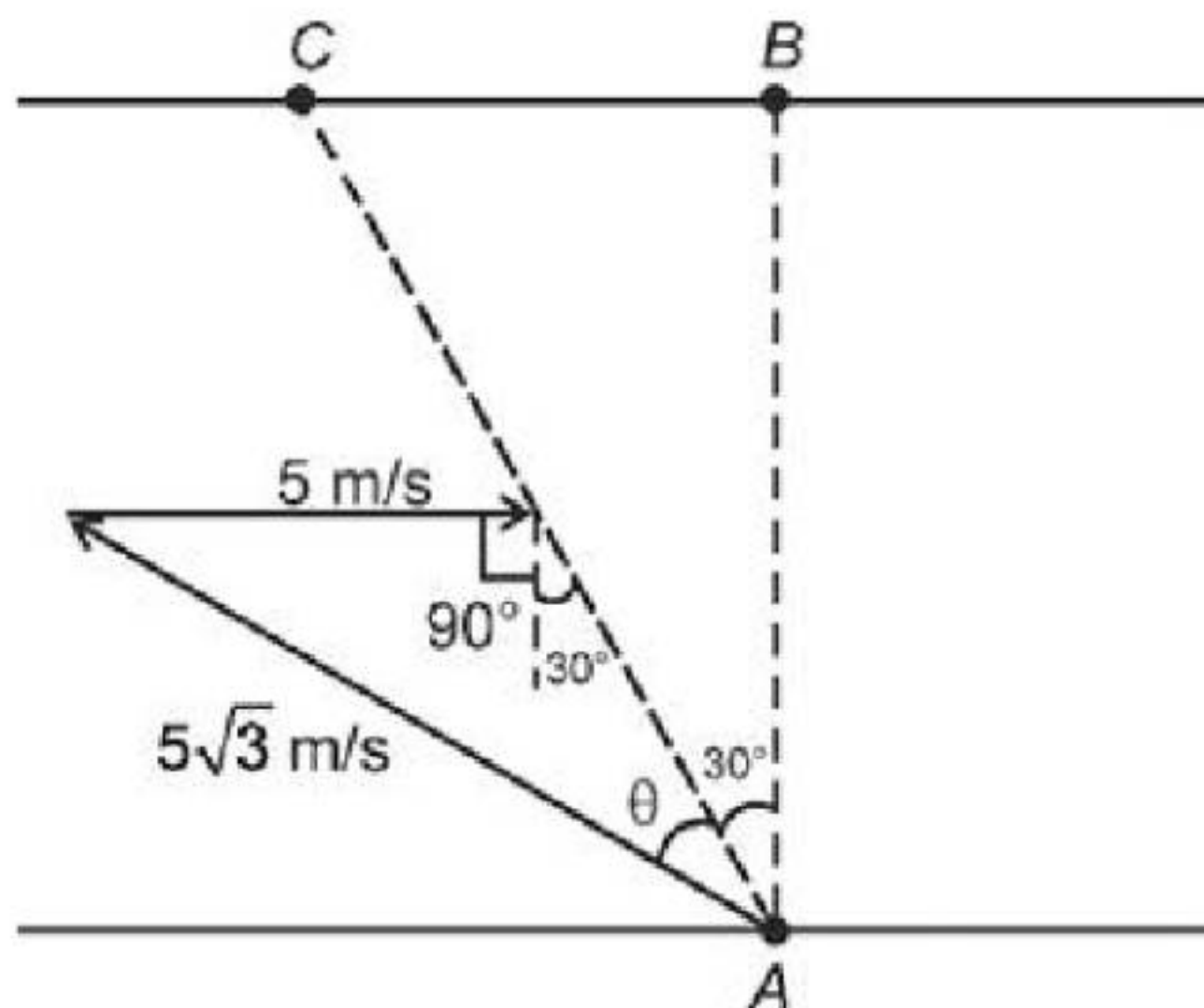
Hint:

Make proper figure and apply sine rule.

Solution:



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Apply sine rule :

$$\frac{\sin(90^\circ + 30^\circ)}{5\sqrt{3}} = \frac{\sin \theta}{5}$$

$$\frac{\cos 30^\circ}{\sqrt{3}} = \sin \theta \Rightarrow \sin \theta = \frac{1}{2}$$

$$\Rightarrow \theta = 30^\circ$$

Angle with respect to the direction of flow = $90^\circ + 30^\circ + 30^\circ = 150^\circ$

(45) Answer : (3)

Solution:

$$10 \text{ N} = x \text{ units}$$

$$10 [M_1 L_1 T_1^{-2}] = x [M_2 L_2 T_2^{-2}]$$

$$x = 10 \left[\left(\frac{M_1}{M_2} \right) \left(\frac{L_1}{L_2} \right) \left(\frac{T_1}{T_2} \right)^{-2} \right]$$

$$= 10 \cdot \left[\left(\frac{1}{10} \right) \left(\frac{1}{100} \right) \left(\frac{1}{30} \right)^{-2} \right]$$

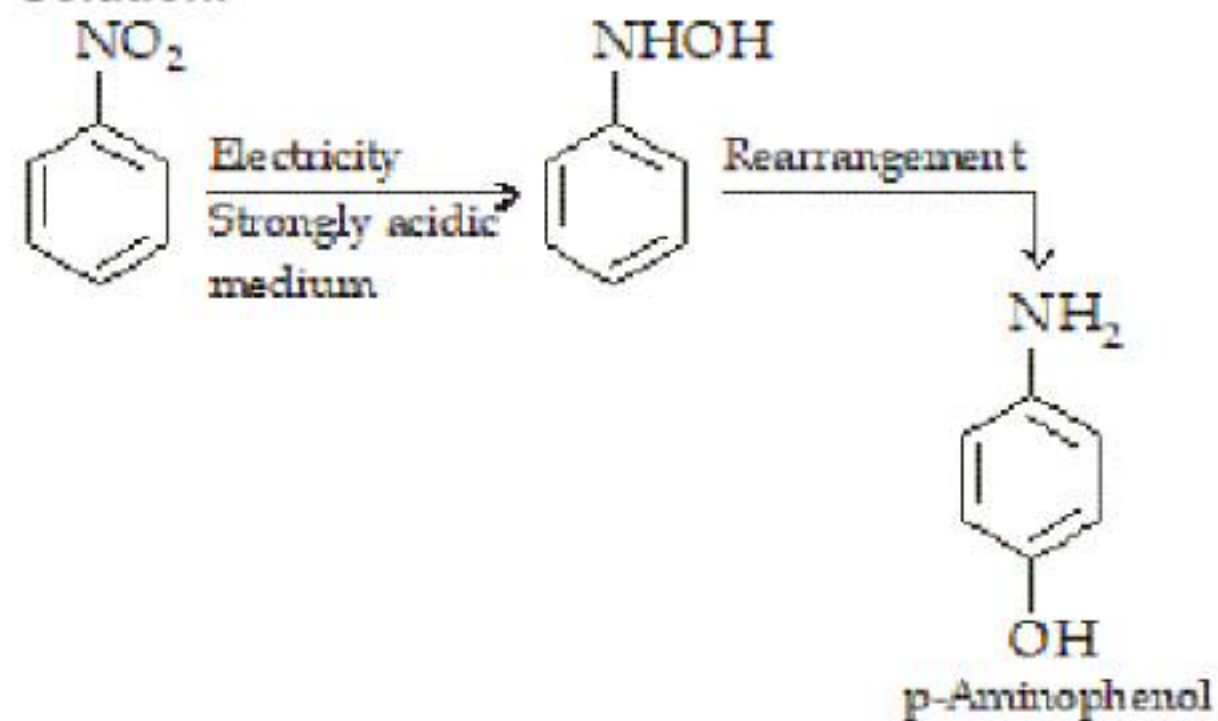
$$= \frac{10 \times 900}{10 \times 100} = 9 \text{ units}$$


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CHEMISTRY

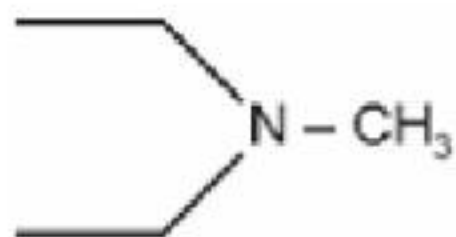
(46) Answer : (2)

Solution:



(47) Answer : (2)

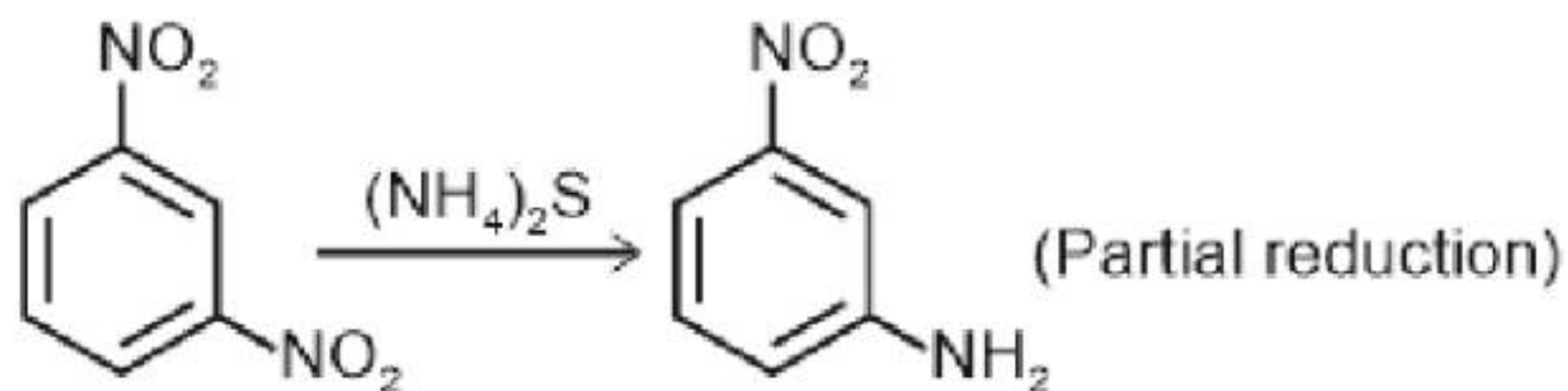
Solution:



N-Ethyl-N-methylethanamine

(48) Answer : (1)

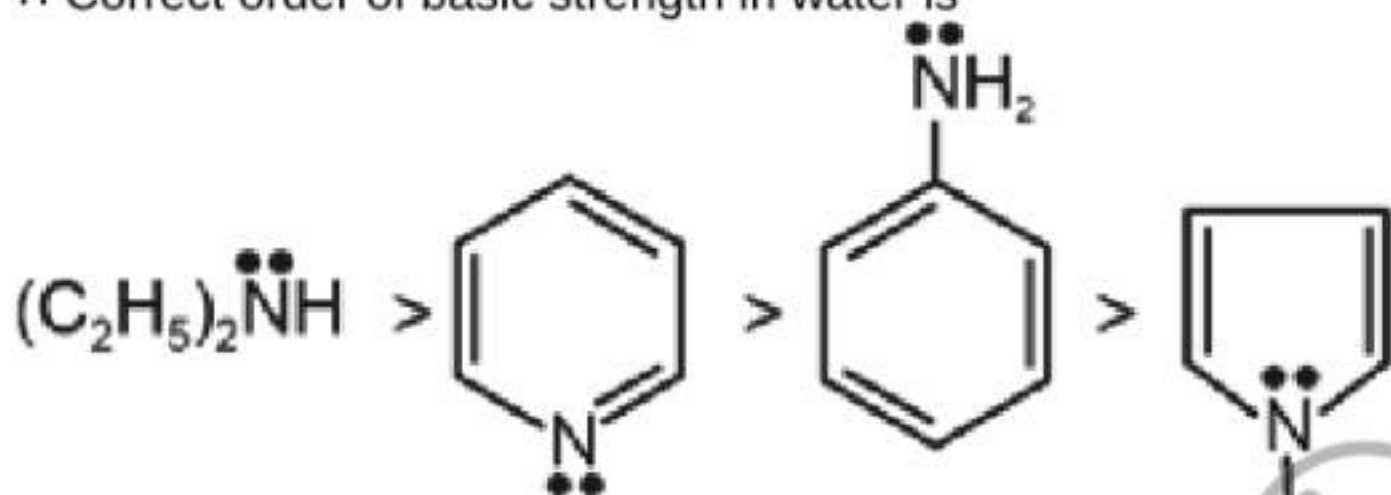
Solution:



(49) Answer : (1)

Solution:

⇒ As electron density increases on nitrogen atom, its basic strength increases.
 ⇒ Due to delocalisation of electron pair of nitrogen, its basic strength decreases.
 ∴ Correct order of basic strength in water is



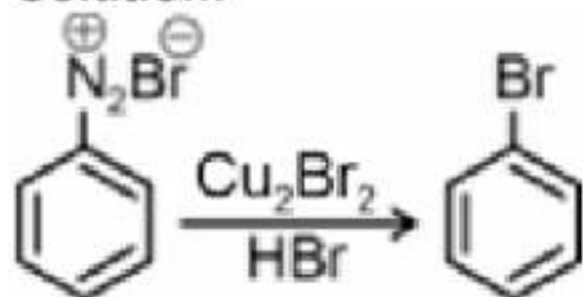
(50) Answer : (2)

Solution:

The synthesis of amides from amines with acyl halides or anhydrides in the presence of aqueous base is known as the Schotten-Baumann reaction.

(51) Answer : (3)

Solution:



The reaction is called Sandmeyer reaction.

(52) Answer : (2)

Solution:

Aniline or vinyl amine cannot be synthesised by Gabriel phthalimide synthesis.

(53) Answer : (1)

Solution:



The above reaction is an example of electrophilic substitution reaction.

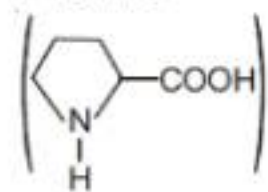
(54) Answer : (1)

Hint:

Amino acid containing five membered ring.

Solution:

Proline



is a cyclic amino acid.

(55) **Answer :** (3)

Hint:

Uracil is present in RNA

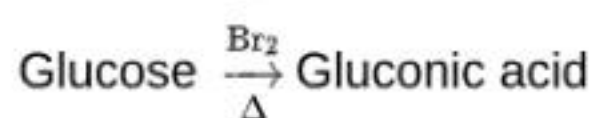
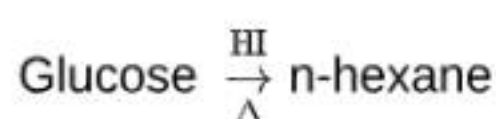
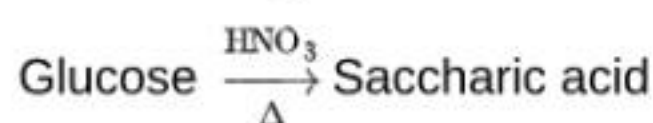
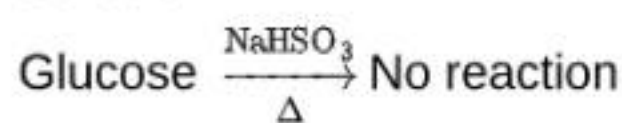
Solution:

Nitrogenous bases in RNA are

Adenine, Guanine, Cytosine and Uracil

(56) **Answer :** (1)

Solution:

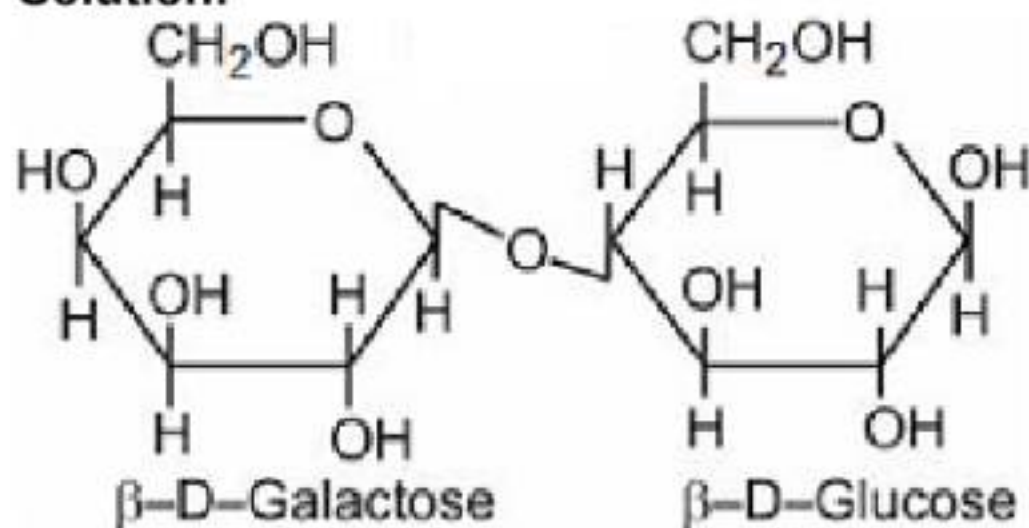


(57) **Answer :** (1)

Hint:

Lactose is commonly known as milk sugar

Solution:



(58) **Answer :** (1)

Solution:

Melting point of α -form of glucose is 419 K while that of β -form of glucose is 423 K.

(59) **Answer :** (2)

Solution:

In Mohr's salt, iron is in +2 oxidation state & KMnO_4 oxidises it to +3.

(60) **Answer :** (4)

Solution:

Phenolphthalein is colourless in acidic medium.

(61) **Answer :** (1)

Solution:

Proline and serine are non-essential amino acids.

(62) **Answer :** (4)

Hint:

1° structure remains unaltered during denaturation of proteins.

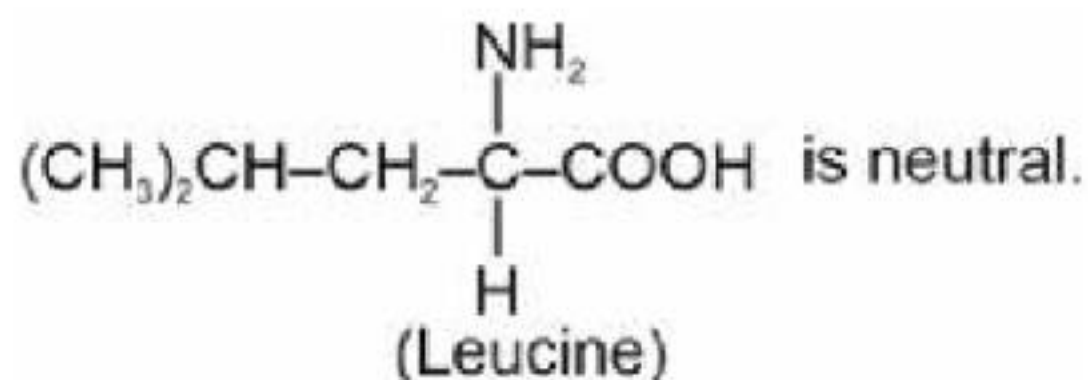
Solution:

Proteins loses its biological activity after denaturation.

(63) **Answer :** (3)

Solution:

Equal number of amino and carboxyl group makes amino acid molecule as neutral.

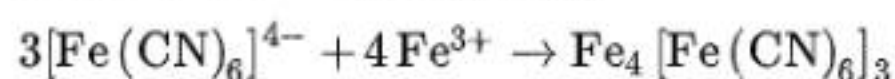
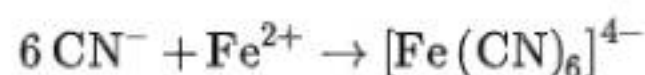


(64) Answer : (2)

Solution:

If adrenal cortex does not function properly then one of the results may be Addison's disease which is characterised by hypoglycemia, weakness and increased susceptibility to stress.

(65) Answer : (2)

Solution:

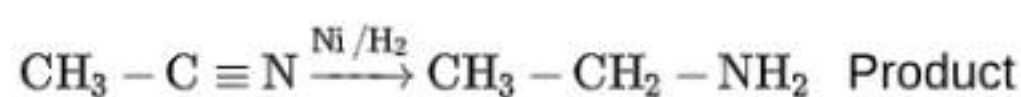
Prussian blue

(66) Answer : (1)

Solution:

Some of the heat released during neutralisation is used for ionisation of weak acid when strong base and weak acid undergoes neutralization.

(67) Answer : (2)

Solution:

(68) Answer : (4)

Hint:

Group reagents are used for the separation of cation due to their selective precipitation.

Solution:**Group Group reagent**

Group-I Dilute HCl

Group-II H₂S gas in presence of dil.HClGroup-III NH₄OH in presence of NH₄ClGroup-IV H₂S in presence of NH₄OH

(69) Answer : (3)

Solution:

Amylopectin is a branched chain polymer of α -D-glucose units in which chain is formed by C₁ – C₄ glycosidic linkage whereas branching occurs at C₁ – C₆ glycosidic linkage.

(70) Answer : (2)

Solution:

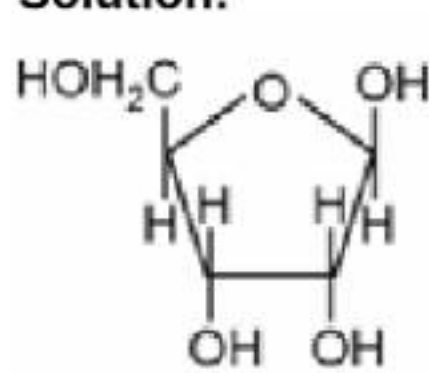
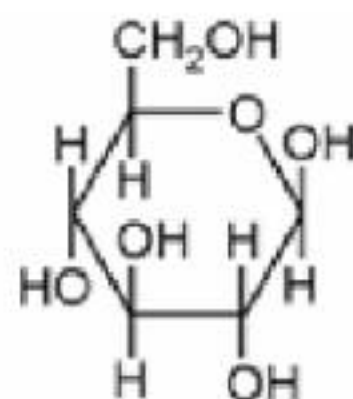
Insulin is an example of globular protein.

(71) Answer : (1)

Solution:

Rickets and scurvy are caused by the deficiency of vitamin D and vitamin C respectively.

(72) Answer : (4)

Solution: β -D-ribose β -D-glucose

(73) Answer : (4)

Solution:

Thyroxine produced in thyroid glands is an iodinated derivative of amino acid tyrosine.

(74) **Answer :** (1)**Solution:**

Cellulose is a straight chain polysaccharide composed of only β -D-glucose units.

(75) **Answer :** (2)**Solution:**

	Compounds	pK _b in aqueous medium
(a)	Benzenamine	9.38
(b)	N, N-Dimethylaniline	8.92
(c)	N-methylaniline	9.30
(d)	Phenylmethanamine	4.70

(76) **Answer :** (1)**Solution:**

- Cytosine, thymine and uracil are pyrimidine bases.
- Adenine and guanine are purine bases.

(77) **Answer :** (3)**Solution:**

Aliphatic and aromatic primary amines on heating with chloroform and ethanolic KOH form isocyanides.

(78) **Answer :** (4)**Solution:**

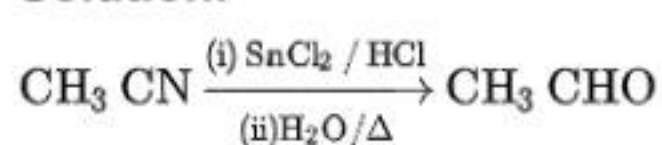
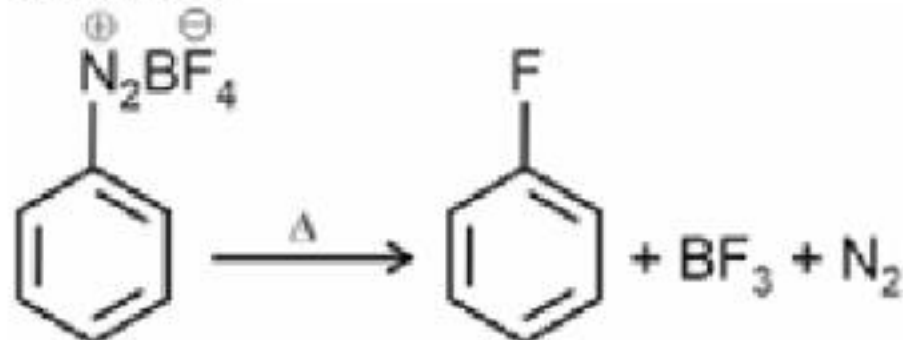
Aniline does not undergo Friedel-Crafts reaction due to salt formation with aluminium chloride which is used as catalyst.

(79) **Answer :** (4)**Solution:**

Three degree amines do not react with benzenesulphonyl chloride.

(80) **Answer :** (4)**Solution:**

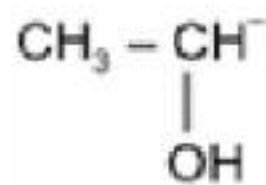
Compounds	Boiling point (K)
n-C ₄ H ₉ OH	390.3
n-C ₄ H ₉ NH ₂	350.8
(C ₂ H ₅) ₂ NH	329.3
C ₂ H ₅ N(CH ₃) ₂	310.5

(81) **Answer :** (2)**Solution:**(82) **Answer :** (3)**Solution:**(83) **Answer :** (4)**Solution:**

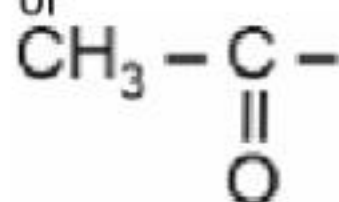
3° alcohols give immediate turbidity on reaction with Lucas reagent (ZnCl₂ and Conc. HCl).

(84) **Answer :** (2)**Solution:**

Iodoform test is given by the compounds containing



or



groups.

(85) Answer : (2)

Solution:

Metal cations	Colour of the flame observed by naked eye
Cu^{2+}	Green flame with blue centre
Sr^{2+}	Crimson red
Ba^{2+}	Apple green
Ca^{2+}	Brick red

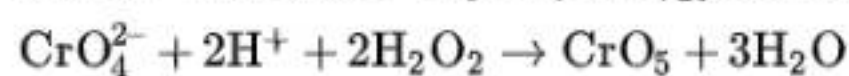
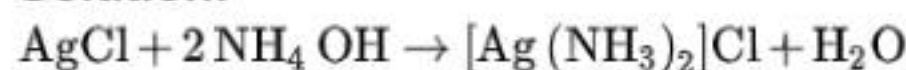
(86) Answer : (3)

Solution:

PbS is black in colour while PbCrO_4 is yellow colour compound.

(87) Answer : (4)

Solution:



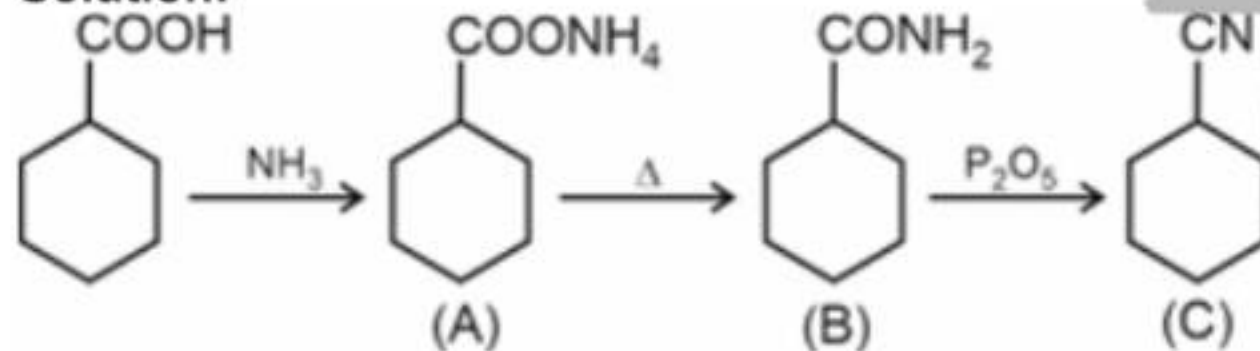
(88) Answer : (2)

Solution:

Tollens' test is given by both aliphatic and aromatic aldehydes.

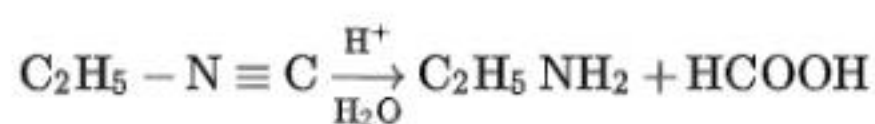
(89) Answer : (2)

Solution:



(90) Answer : (2)

Solution:



BOTANY

(91) Answer : (1)

Hint:

Occurrence of food webs provide stability to the ecosystem.

Solution:

The network of interconnected food chains at different trophic levels in a biotic community is termed as food web.

(92) Answer : (3)

Solution:

In ecological pyramids, energy at a lower trophic level is always more than that at a higher level. Trophic level represents a functional level, not a species as such. A given species may occupy more than one trophic level in the same ecosystem at the same time.

- (93) **Answer :** (4)
Solution:
The food chain Trees → Birds → Lice → Bacteria, represents a parasitic food chain.
- (94) **Answer :** (2)
Solution:
Deep sea is the least productive ecosystem among the given options.
- (95) **Answer :** (3)
Solution:
Productivity, nutrient cycling, energy flow and decomposition are the functional aspects of an ecosystem.
- (96) **Answer :** (4)
Solution:
Trees occupy the top vertical layer of a forest, shrubs occupy the second layer and herbs and grasses occupy the bottom layer.
- (97) **Answer :** (3)
Solution:
Humus is dark coloured amorphous substance.
- (98) **Answer :** (1)
Solution:
Sparrow is a primary consumer when it eats seeds, fruits, etc. and a secondary consumer when it eats insects and worms.
- (99) **Answer :** (4)
Solution:
Vertical distribution of different species occupying different levels is called stratification.
- (100) **Answer :** (2)
Solution:
A much larger fraction of energy flows through DFC than through GFC in terrestrial ecosystems. GFC is the major conduit of energy flow in an aquatic ecosystem.
- (101) **Answer :** (3)
Solution:
Nice Perch was responsible for the extinction of more than 200 species of Cichlid fish.
- (102) **Answer :** (2)
Solution:
In India,
Wild life sanctuaries are 448,
Biosphere reserves are 14 and
National parks are 90
- (103) **Answer :** (3)
Solution:
India has more than 50,000 genetically different strains of rice, and 1,000 varieties of mango, showing genetic diversity.
- (104) **Answer :** (1)
Solution:
Khasi and Jaintia hills are the sacred groves in Meghalaya.
- (105) **Answer :** (3)
Solution:
Some recent extinctions include Quagga from Africa, Thylacine from Australia, Dodo from Mauritius and Steller's sea cow from Russia.
- (106) **Answer :** (4)
Solution:
- | Taxa | Number of species in Amazonian rain forest |
|----------|--|
| Birds | 1300 |
| Reptiles | 378 |
| Fishes | 3000 |
| Mammals | 427 |
- (107) **Answer :** (3)
Solution:

The regression coefficient (z) values are in the range of 0.6 to 1.2 for very large areas.

(108) Answer : (2)

Solution:

Species diversity increases from pole to equator. Passenger pigeon became extinct due to over-exploitation by humans.

(109) Answer : (1)

Solution:

Critically Endangered category represents that a species is facing an extremely high risk of extinction in the wild in the immediate future.

(110) Answer : (1)

Solution:

Increased diversity contributes to more productivity. More diverse communities show less year to year variation in biomass production. Productivity decreases with decrease in biodiversity.

(111) Answer : (2)

Solution:

When a host fish species becomes extinct, its unique assemblage of parasites also meets the same fate, this exemplifies co-extinctions.

(112) Answer : (1)

Solution:

An analogy used by Stanford ecologist Paul Ehrlich suggested that rivets on the wings of a plane represents key species.

(113) Answer : (2)

Solution:

Ecosystem-1 has more species diversity as compared to ecosystem-2. Complexity of food web in ecosystem-1 is greater than ecosystem-2 thus the ecosystem-1 is more stable than ecosystem-2. The given food chains are of terrestrial habitat and major conduit of energy flow in such ecosystem is DFC.

(114) Answer : (3)

Solution:

$$GPP - R = NPP$$

NPP is the available biomass for the consumption to herbivores and decomposers.

(115) Answer : (3)

Solution:

According to the first law of thermodynamics, energy can neither be created nor destroyed, only converted from one form to another.

(116) Answer : (3)

Solution:

Detritus food chain may be connected with the grazing food chain at some level.

Pyramid of number in tree ecosystem can be inverted, while in a grassland ecosystem, it is always upright.

(117) Answer : (2)

Solution:

$$\text{The \% of solar energy used for GPP} = \frac{34580}{600000} \times 100 \approx 5.8\%$$

$$\text{Respiratory loss by consumer} = GPP - NPP = 305 - 81 \text{ kcal m}^{-2} \text{ yr}^{-1}$$

(118) Answer : (2)

Solution:

Primary productivity depends on the plant species inhabiting a particular area. It also depends on a variety of environmental factors, the availability of nutrients and the photosynthetic capacity of plants; thus, sunlight and the availability of nutrients are major limiting factors for the low productivity of oceans.

(119) Answer : (4)

Solution:

Primary producers convert only 1% of the trapped solar energy and utilize it for production of biomass (GPP).

(120) Answer : (2)

Solution:

	T1	→ T2	→ T3	→ T4
	Producer	Primary consumer	Secondary consumer	Tertiary consumer
GPP (kcal m ⁻² yr ⁻¹)	4000x	400x	40x	4x
NPP (kcal m ⁻² yr ⁻¹)	400x	40x	4x	0.4x

(121) Answer : (1)

Solution:

Each trophic level has a certain mass of living material at a particular time, called as the standing crop. Decomposition is an oxygen-requiring process.

(122) Answer : (2)

Solution:

Inverted pyramid of biomass is seen in an aquatic ecosystem.
Pyramid of energy is always upright for any ecosystem.
Tree ecosystem can be spindle-shaped or inverted w.r.t. number.

(123) Answer : (3)

Solution:

Productivity of tropical environments is higher than the temperate environments because there is more solar energy available in the tropics.

(124) Answer : (2)

Solution:

Alexander von Humboldt was the German naturalist and geographer. On log scale, the relationship is a straight line, described by the equation $\log S = \log C + Z \log A$

(125) Answer : (3)

Solution:

According to the IUCN Red list, amphibians appear to be more vulnerable to extinction. Colombia has nearly 1400 species of birds. The Tropical Amazon forest is home to 378 reptile species.

(126) Answer : (4)

Solution:

Formation of fruits or seeds in nature is a broadly utilitarian service, but their use by humans is a narrowly utilitarian service.

(127) Answer : (1)

Solution:

The Earth Summit was held in 1992.
World Summit on sustainable development was held in 2002 in Johannesburg.
IUCN Red list (2004) documented the extinction of 784 species.

(128) Answer : (3)

Solution:

The transition zone surrounds the buffer zone. The buffer zone surrounds the core area and is managed to accommodate greater research and educational activity.

(129) Answer : (1)

Solution:

Many nations find *in-situ* conservation unrealistic and economically not feasible to conserve all their biological wealth. Invariably, the number of species waiting to be saved from extinction far exceeds the conservation resources available.

(130) Answer : (2)

Solution:

Predators keep the prey population under control. Water hyacinth, introduced in India, did not have its natural predator.

(131) Answer : (1)

Solution:

Sacred groves have special religious importance to a particular culture.

(132) Answer : (3)

Solution:

Converter or transducer are the producers that convert solar energy into chemical energy.

(133) Answer : (1)

Solution:

Estuary is an aquatic ecosystem.

(134) Answer : (3)

Solution:

Due to low species diversity, the anthropogenic ecosystem is not considered as stable ecosystem.

(135) Answer : (3)

Solution:

Total 34 biodiversity hotspots have been identified globally.

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(136) Answer : (1)

Solution:

Limulus is also known as king crab.

(137) Answer : (4)

Solution:

Ctenoplana belongs to the phylum Ctenophora, in which fertilisation is external with indirect development.

(138) Answer : (1)

Solution:

In echinoderms, digestive system is complete with mouth on the lower (ventral) side and anus on the upper (dorsal) side.

(139) Answer : (3)

Solution:

Perforated gill slits are characteristic feature of chordates which persist usually in fishes from embryonic to adult stages. In urochordates, cyclostomes and cartilaginous fishes, notochord is not completely replaced by vertebral column. The four chambered heart found in birds and mammals is associated with pulmonary and systemic circulation.

(140) Answer : (2)

Solution:

Corvus is a bird and is a homeotherm.

(141) Answer : (3)

Solution:

Sharks are cartilaginous fishes (Chondrichthyes). In cartilaginous fishes, skin is tough and covered with placoid scales; swim bladder or air bladder is absent. So, they have to swim continuously. Tail or caudal fin is heterocercal in members of the class Chondrichthyes. They possess 5-7 pairs of gills slits, without operculum.

(142) Answer : (3)

Solution:

Arthropods have an open circulatory system and three germ layers. Insects have Malpighian tubules as their excretory structures. Green glands are present in crustaceans for excretion. Arthropods are segmented animals.

(143) Answer : (2)

Solution:

In molluscs, the space between the visceral hump and the mantle is called the mantle cavity in which feather-like gills are present.

(144) Answer : (4)

Solution:

Sponges are hermaphrodites *i.e.*, male and female gametes are produced by the same individual. Most of the sponges are marine and asymmetric animals. Both sexual and asexual reproduction occur in them.

Sponges have intracellular digestion as food is digested within food vacuoles inside the cells. There is no extracellular digestion in sponges.

(145) Answer : (2)

Solution:

Meandrina belongs to the phylum Coelenterata. Coelenterates are multicellular animals, which are radially symmetrical and have tissue level of organization.

(146) Answer : (1)

Solution:

Frogs show external fertilisation and indirect development. Their skin is moist without scales. Their body is divided into head and trunk. Their eyes have eyelids.

(147) Answer : (2)

Solution:

The forelimbs of birds are modified into wings. The hind limbs generally have scales and are modified for walking, swimming and clasping the tree branches.

(148) Answer : (4)

Solution:

Carcharodon is a cartilaginous fish and they have gill slits without operculum.

Fishes respire through gills.

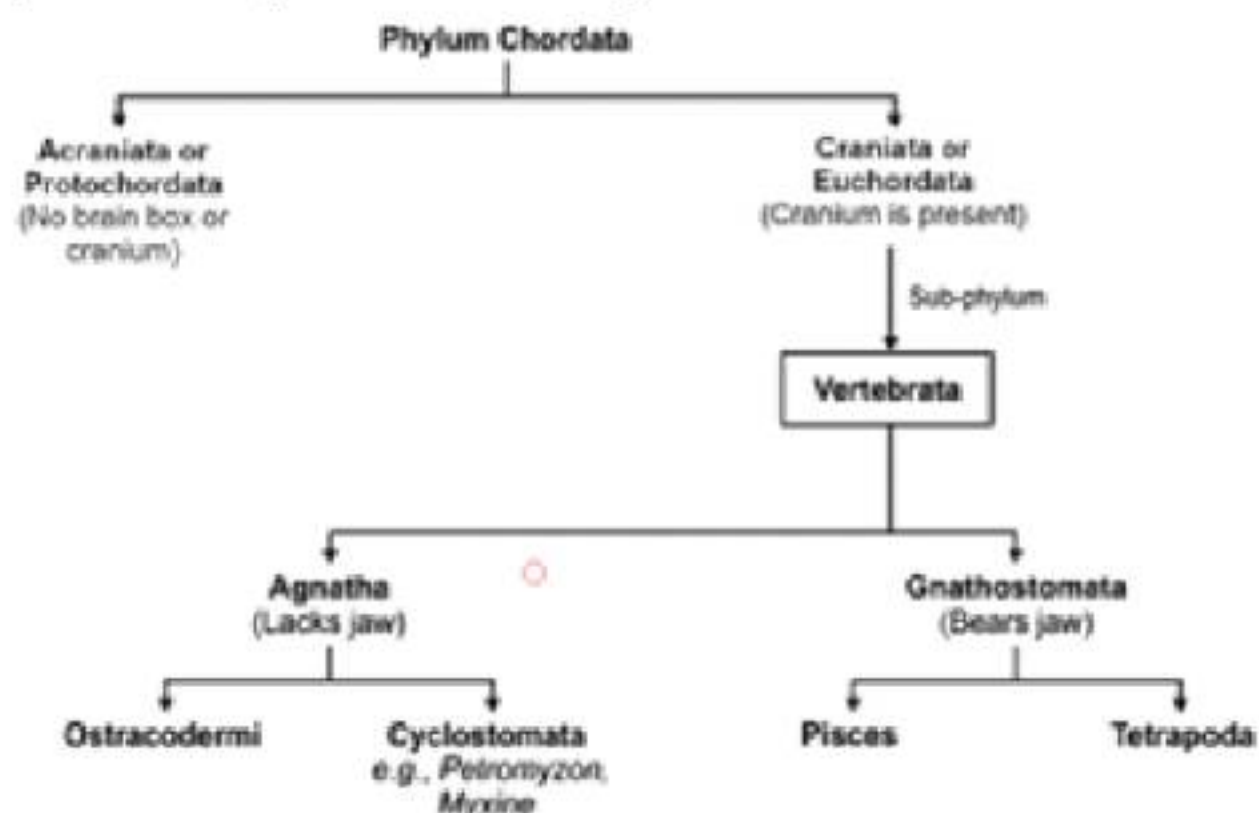
Struthio (Ostrich) is a flightless bird.

External ear openings are absent in snakes.

(149) Answer : (1)

Solution:

Myxine belongs to the class Cyclostomata.



(150) Answer : (4)

Solution:

Nereis, an aquatic annelid, is dioecious.

(151) Answer : (2)

Solution:

Sea cucumber, sea urchin, sea-pen and sea-fan are found in the marine habitat.

Adult echinoderms are radially symmetrical but their larvae are bilaterally symmetrical.

(152) Answer : (4)

Solution:

- Hookworm *i.e.*, *Ancylostoma*, belongs to the phylum Aschelminthes.
- Earthworm is a coelomate and monoecious organism.
- Silkworm is a coelomate and dioecious organism.
- Tapeworm is an acoelomate and monoecious organism.

(153) Answer : (3)

Solution:

Balanoglossus – Belongs to the phylum Hemichordata.

Anopheles – Belongs to the phylum Arthropoda

Laccifer – Belongs to the phylum Arthropoda

Both hemichordates and arthropods have an open circulatory system.

(154) Answer : (3)

Solution:

Pennatula (Sea-pen), *Adamsia* (Sea-anemone) and *Gorgonia* (Sea-fan) belong to the phylum Coelenterata. *Aplysia* (Sea-hare) is a mollusc.

(155) Answer : (3)

Solution:

The body of arthropods is covered by a hard and water-proof exoskeleton made up of chitin. This chitinous exoskeleton is one of the reasons of successful existence of arthropods on land.

(156) Answer : (2)

Solution:

In hemichordates, circulatory system is of open type. They have proboscis gland for excretion.

In echinoderms, no excretory structure is present. Echinoderms are characterized by calcareous ossicles.

(157) Answer : (3)

Solution:

In cnidarians, two basic body forms are seen, called polyp and medusa. Former is a sessile and cylindrical form like *Hydra*, whereas the latter is umbrella-shaped and free-swimming. Alternation of generation between these two body forms is called metagenesis.

(158) Answer : (1)

Solution:

Except cephalopods, molluscs have an open type of circulation. *Sepia* (cephalopod) has closed type of circulatory system.

Pila, *Pinctada*, *Dentalium* and *Chaetopleura* have an open circulatory system.

Bombyx has an open circulatory system. *Pristis* is a chordate and chordates have closed circulatory system.

(159) Answer : (3)**Solution:**

Malpighian tubules of arthropods and nephridia of annelids are excretory in function, hence these are functionally similar. Book gills, trachea and gills structures are respiratory structures.

(160) Answer : (4)**Solution:**

Aurelia (Jelly fish) is a cnidarian and it exhibits tissue level of organisation. It has two germ layers and shows radial symmetry.

(161) Answer : (3)**Solution:**

Ctenophores have eight comb plates. Special sense organs called statocysts are present in ctenophores. They lack nematocysts. Sexes are not separate, *i.e.*, they are monoecious.

(162) Answer : (4)**Solution:**

Urochordates have an open circulatory system. They are chordates but not vertebrates. Pisces is a super-class under the division Gnathostomata (that includes all true fishes). All vertebrates do not bear jaw. Cyclostomes fall under the division Agnatha and the sub-phylum Vertebrata; they are jawless.

(163) Answer : (3)**Solution:**

Reptiles show incomplete double circulation as their ventricle is incompletely divided, allowing mixing of oxygenated and deoxygenated blood.

(164) Answer : (2)**Solution:**

Amphibia	–	Cutaneous respiration in addition to pulmonary respiration
Reptilia	–	Tympanum represents ear
Aves	–	Only one pair of walking limbs, air sacs present
Mammalia	–	Diaphragm and only pulmonary respiration

(165) Answer : (2)**Solution:**

Ascaris uses excretory tube for excretion. Water vascular system is present in echinoderms. *Euspongia* (sponges) have a water canal system. Green gland is an excretory structure in prawn.

(166) Answer : (3)**Solution:**

Correct trend w.r.t. the body organisation from simple to complex forms:

Porifera → Cnidaria → Platyhelminthes → Annelida → Arthropoda → Mollusca → Echinodermata → Chordata

(167) Answer : (3)**Solution:**

Both hemichordates and chordates show bilateral symmetry, triploblasty and have true coelom.

Ventral heart is present in chordates.

(168) Answer : (4)**Solution:**

Platyhelminths are acoelomates, *i.e.*, body cavity is absent in them.

(169) Answer : (3)**Solution:**

The given figure is of *Petromyzon* which belongs to the class Cyclostomata. Cyclostomes have a sucking and circular mouth without jaws. Their body is devoid of scales and paired fins. Cranium and vertebral column are cartilaginous. Circulation is of closed type. Cyclostomes are marine but migrate for spawning to fresh water.

(170) Answer : (2)**Solution:**

Evolutionarily, aquatic respiration by gills gave way to cutaneous respiration in amphibians and then to pulmonary respiration in reptiles, birds and mammals.

(171) Answer : (3)

Solution:

The transition from radial to bilateral symmetry is a major evolutionary trend in the animal kingdom, marking the shift from sedentary or passively drifting lifestyle to active and directional mobility.

(172) Answer : (2)**Solution:**

In chordates, the notochord lies between the gut and the nerve cord, a key diagnostic feature of chordates. In vertebrates, notochord is replaced by the vertebral column in adults.

(173) Answer : (3)**Solution:**

Diploblastic animals like cnidarians lack mesoderm and bilateral symmetry. Between ectoderm and endoderm, an undifferentiated layer called mesoglea is present.

(174) Answer : (1)**Solution:**

Roundworms possess pseudocoelom and are unsegmented, bilaterally symmetrical organisms that perform internal fertilisation, while earthworms possess true coelom and are segmented, bilaterally symmetrical organisms that perform external fertilisation.

(175) Answer : (2)**Solution:**

Sycon – Porifera – Choanocytes
Pleurobrachia – Ctenophora – Ciliated locomotory structure
Balanoglossus – Hemichordata – Proboscis gland
Physalia – Coelenterata – Metagenesis

(176) Answer : (1)**Solution:**

Rana, *Naja* and *Calotes* are tetrapod vertebrates. *Pristis* and *Pterophyllum* are vertebrates that belong to the superclass Pisces and class Chondrichthyes and Osteichthyes, respectively.

(177) Answer : (3)**Solution:**

Adult echinoderms are eucoelomates and show radial symmetry in the adult form. Platyhelminths are triploblastic acoelomates. All diploblastic animals (cnidarians and ctenophores) show tissue level of body organisation. *Hydra* is a freshwater diploblastic animal.

(178) Answer : (2)**Solution:**

Adult echinoderms are eucoelomates and exhibit radial symmetry. All animals are multicellular. *Amoeba* is a protozoan.

(179) Answer : (3)**Solution:**

Amphibians, reptiles, birds and *Ornithorhynchus* (mammal) are oviparous tetrapods. They have a closed circulatory system.

(180) Answer : (2)**Solution:**

Presence of hair on skin and presence of mammary glands are unique features of mammals. Birds also have 4-chambered muscular heart.

Birds and mammals are homeotherms, *i.e.*, they are able to maintain a constant body temperature.