

09/09/2026



Aakash

Medical | IIT-JEE | Foundations

Code-D

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Fortnightly Test for NEET-2027 (XII-Passed_P4)_FT-01D

MM : 720

Time : 180 Min.

Topics Covered:**Physics:** Units & Measurements, Motion in a Straight Line**Chemistry:** Some Basic Concepts of Chemistry**Botany:** Cell: The Unit of Life**Zoology:** Structural Organisation in Animals–Animal Tissues, Biomolecules**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.

PHYSICS

1. Momentum can be expressed as a derived quantity in terms of

- (1) Mass and time (2) Length and time
(3) Length and mass (4) Length, mass and time

2. The number of significant figures in measured value 5.40×10^3 is

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

3. A : The absolute error has the same unit as the quantity itself.

R : Fractional error has no unit.

- (1) Both Assertion & Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion & Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Both Assertion and Reason are false statements

4. A physical quantity P is related to four measured quantities A, B, C and D as

$$P = \frac{A^2 B}{C^{2/3} D^{3/4}}$$

The percentage errors in the measurement of A, B, C and D are 1%, 2%, 3% and 2% respectively. The percentage error in the measurement of P is

- (1) 0.5% (2) 7.5%
(3) 6% (4) 8.5%

5. The time period of oscillation of simple pendulum given by $T = 2\pi\sqrt{\frac{L}{g}}$ where $L = (200 \pm 0.1)$ cm. The time period, $T = 4$

s and the time of 100 oscillations is measured using a stopwatch of least count 0.1 s. The percentage error in g is

- (1) 0.1% (2) 1.5%
(3) 2% (4) 4%

6. Which of the following is the smallest unit of length?

- (1) Millimeter (2) Angstrom
(3) Picometer (4) Fermi

7. 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)

8. The value of $(24.36 + 0.0623 + 256.2)$ with proper significant digit is

- (1) 280.7 (2) 280.6
(3) 280.622 (4) 281

9. Match the List-I with List-II.

List-I

List-II

(A) Gravitational constant (P) $[ML^0T^{-3}K^{-4}]$ (B) Coefficient of viscosity (Q) $[MLT^{-3}K^{-1}]$ (C) Thermal conductivity (R) $[M^{-1}L^3T^{-2}]$ (D) Stefan constant (S) $[ML^{-1}T^{-1}]$

Choose the correct option from the option given below

(1) (A)-(Q), (B)-(R), (C)-(P), (D)-(S)

(2) (A)-(S), (B)-(Q), (C)-(P), (D)-(R)

(3) (A)-(P), (B)-(Q), (C)-(R), (D)-(S)

(4) (A)-(R), (B)-(S), (C)-(Q), (D)-(P)

10. Consider the following statement.

Statement A : The dimensional correctness of an equation can be verified using the principle of homogeneity.**Statement B :** All unitless quantities are dimensionless.

Which option is correct based on above information?

(1) Both statements A and B are true

(2) Both statements A and B are false

(3) Statement A is true but statement B is false

(4) Statement A is false but statement B is true

11. If position x (in meter) depends upon time t (in second) as $x = (at + bt^2)$ where a and b are dimensional constants, then the SI unit of b will be

(1) m

(2) $m s^{-1}$ (3) $m s^{-2}$ (4) $m^2 s^{-1}$ 12. In a Vernier calipers, one main scale division is equal to N cm and n division of the Vernier scale coincides with $(n - 1)$ division of the main scale. The least count (in cm) of the calipers is(1) $\frac{N}{n+1}$ (2) $\frac{N}{n-1}$ (3) $\frac{N}{n}$ (4) $\frac{Nn}{n-1}$ 13. If two physical quantities A and B have different dimensions, then which mathematical operation given below is physically possible?(1) $\sqrt{AB}$ (2) $A + B$ (3) $A - B$ (4) $B(A + B)$

14. 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) $0.0001 m^3$

15. What is the number of significant figure in measurement 433.00?

(1) 5

(2) 4

(3) 2

(4) 3

16. If percentage error in radius of a sphere is 0.2%, then the percentage error in its volume is

(1) 0.2%

(2) 0.4%

(3) 0.6%

(4) 0.8%

17. The length and breadth of a rectangle are 2.0 m and 4.01 m respectively. The area of the rectangle upto correct significant figures is

(1) $8.20 m^2$ (2) $8.02 m^2$ (3) $8.00 m^2$ (4) $8.0 m^2$

18. In a certain system, the units of length, mass and time are chosen to be 10 cm, 100 g and 20 s. The unit of kinetic energy will be

(1) 2.5 erg

(2) 5 erg

(3) 25 erg

(4) 50 erg

19. A student measures the length of a rectangular sheet using a vernier calliper of least count 0.01 cm. The main scale reading is 7.6 cm and 4th division of vernier coincides with one of the main scale division. If vernier caliper has a zero error of -0.03 cm, then the correct length of the sheet is

(1) 7.61 cm

(2) 7.64 cm

(3) 7.67 cm

(4) 7.63 cm

20. If energy $[E]$, velocity $[V]$ and time $[T]$ are chosen as fundamental quantities, then dimensional formula of force is(1) $[EV^{-1}T^{-1}]$ (2) $[EV^{-1}T]$ (3) $[EV^{-1}T^{-2}]$ (4) $[EVT^{-2}]$ 21. A screw gauge has a least count of 5 μm and its circular scale is divided into 200 equal divisions. One main scale division is (assume the value of one main scale division to be same as the pitch of the screw gauge)

(1) 0.005 m

(2) 1 mm

(3) 1 cm

(4) 0.0025 mm

22. A student measured the diameter of a steel ball using a screw gauge of least count 0.002 cm. The main scale reading is 5 mm and zero of circular scale division coincides with 23 division above the reference level. The correct diameter of ball is

(1) 0.529 cm

(2) 0.546 cm

(3) 0.054 cm

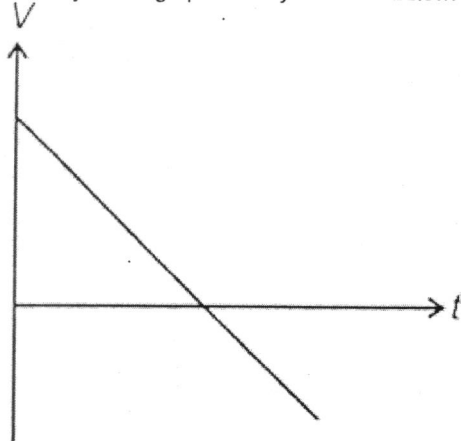
(4) 0.0525 cm

23. A car travels from A to B with speed v_1 and returns to A with speed v_2 , the average velocity of the car is

(1) Zero

(2) $\frac{v_1 + v_2}{2}$ (3) $\frac{2v_1v_2}{v_1 + v_2}$ (4) $\frac{v_1v_2}{2(v_1 + v_2)}$ 24. A particle is moving along x-axis such that its velocity is given as $v = (x^2 + x)$ m/s, where x is in m. The acceleration of the particle at $x = 2$ m is(1) $15 m/s^2$ (2) $20 m/s^2$ (3) $2 m/s^2$ (4) $30 m/s^2$

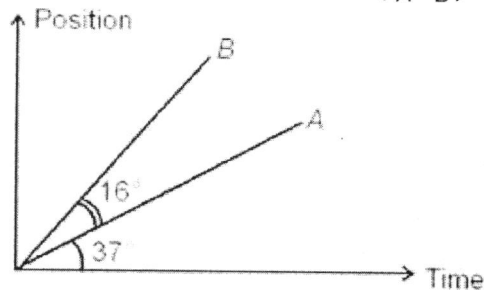
25. Velocity – time graph of body is shown below:



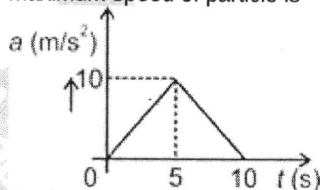
The graph correctly represents the following situation(s):

- (1) A freely falling body from certain height
 - (2) A body vertically projected upwards with certain initial velocity u
 - (3) The body moving on horizontal plane with initial velocity u and constant acceleration in opposite direction to u
 - (4) Both (2) and (3)
26. If a particle is thrown with velocity more than 20 m/s vertically upward, then average acceleration of the particle in last second of its ascent journey is
- (1) g
 - (2) $\frac{g}{2}$
 - (3) $\frac{g}{4}$
 - (4) $\frac{g}{8}$
27. A particle is moving along a straight line. Mark the correct option from the following.
- (1) The sign of acceleration does not indicate that the particle speed is increasing or decreasing
 - (2) The zero velocity of the particle at any instant implies zero acceleration at that instant
 - (3) The sign of acceleration clearly indicates that the particle speed is increasing or decreasing
 - (4) Both (2) and (3) are correct
28. Time taken by a train of length 1 km in crossing a bridge of length of 2 km, moving at a speed of 1 km/minute, will be
- (1) 1 minute
 - (2) 2 minute
 - (3) 3 minute
 - (4) 4 minute
29. A particle starts from rest under constant acceleration $a = 4 \text{ m/s}^2$. Ratio of respective distance travelled by the particle in 3rd and 5th second of its motion is
- (1) 9 : 25
 - (2) 5 : 9
 - (3) 9 : 5
 - (4) 25 : 9
30. A particle moves with constant velocity along a straight line. The ratio of magnitude of displacement to the distance is
- (1) Equal to one
 - (2) Less than one
 - (3) Greater than one
 - (4) Cannot be predicted

31. The position-time graph of two particles A and B are shown in figure. Then ratio of their velocities (v_A/v_B) is

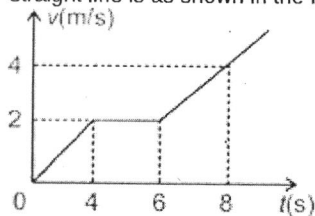


- (1) $\frac{3}{4}$
 - (2) $\frac{4}{3}$
 - (3) $\frac{9}{16}$
 - (4) $\frac{16}{9}$
32. An object travels 40 m in 5 s and then another 40 m in 10 s. Average speed of the object for complete journey is
- (1) 11.44 m/s
 - (2) 5.33 m/s
 - (3) 7 m/s
 - (4) 2.45 m/s
33. If a particle is moving along straight line with increasing speed, then
- (1) Its acceleration is negative
 - (2) Its acceleration may be decreasing
 - (3) Its acceleration must be increasing
 - (4) Both (1) & (3)
34. A particle starts with a velocity of +10 m/s. The acceleration – time ($a-t$) graph for the particle, is as shown in figure. The maximum speed of particle is



- (1) 50 m/s
 - (2) 60 m/s
 - (3) 40 m/s
 - (4) 35 m/s
35. The x-coordinate of a particle moving along x-axis varies as $x = (5t^2 - 10t + 28)$ where x is in metre and t is in seconds. The displacement of the particle in first two seconds is
- (1) -2 m
 - (2) 2 m
 - (3) 28 m
 - (4) Zero
36. A ball is thrown vertically upward from the ground, with a velocity 20 m/s. Find the time taken for the ball to reach a height of 20 m ($g = 10 \text{ m/s}^2$).
- (1) 4 s
 - (2) 3 s
 - (3) 1 s
 - (4) 2 s
37. Value of $\int_0^1 (x^2 + 2x) dx$ is equal to?
- (1) 1
 - (2) $\frac{1}{3}$
 - (3) $\frac{4}{3}$
 - (4) $\frac{2}{3}$

38. Velocity – time ($v-t$) graph of an object moving along a straight line is as shown in the figure.



Acceleration of the object at $t = 3$ s is

- (1) $\frac{1}{3} \text{ m/s}^2$ (2) $\frac{1}{2} \text{ m/s}^2$
 (3) 2 m/s^2 (4) 3 m/s^2
39. A car accelerates from rest at 5 ms^{-2} and then decelerates at 10 m/s^2 till it comes to rest. If the total time of this journey is half a minute. Then find distance travelled
 (1) 750 m (2) 50 m
 (3) 500 m (4) 1500 m
40. A person in lift which is moving up with a uniform retardation of 6 m/s^2 drops a stone from height of 2 m, the time taken by stone to hit the floor of lift will be ($g = 10 \text{ m/s}^2$)
 (1) 2 s (2) 1 s
 (3) 1.5 s (4) 3 s
41. A body starts to fall freely under gravity. The distance covered by it, in 1st second, 2nd second and 3rd second are in ratio
 (1) 1 : 4 : 9 (2) 1 : 2 : 3
 (3) 1 : 3 : 5 (4) 1 : 11 : 14

42. A train of 360 m length is going along east with 50 m/s . A bird flies at a speed 10 m/s towards west parallel to the track. The time taken by the bird to cross the train is
 (1) 10 s (2) 8 s
 (3) 6 s (4) 4 s

43. A ball is thrown vertically upward with a certain speed. It passes through the same point at 3 seconds and 7 seconds from the start. The speed of the projection is
 [given $g = 10 \text{ m/s}^2$]

- (1) 60 m/s^{-1} (2) 50 m/s^{-1}
 (3) 40 m/s^{-1} (4) 70 m/s^{-1}
44. A ball is thrown vertically upwards with velocity of 20 m/s from top of multistorey building 30 m high. How high will the ball rise above ground ($g = 10 \text{ ms}^{-2}$)?
 (1) 40 m (2) 45 m
 (3) 50 m (4) 60 m
45. **Statement I** : A particle may have constant speed but variable velocity.
Statement II : If velocity ($\vec{v}$) and acceleration ($\vec{a}$) are in same direction, then speed of particle increases.
Statement III : If initial velocity ($\vec{u}$) and $\vec{a}$ are collinear, then path of particle will be a straight line.

Consider the above statements and choose the **correct** option.

- (1) Only I is correct
 (2) Only I and III are correct
 (3) Only II is correct
 (4) All the statements are correct

CHEMISTRY

46. Which of the following given statement is/are correct?
 (i) An element of a substance contains only one kind of atoms.
 (ii) In CO_2 , carbon and oxygen chemically combined in a fixed proportion of 3 : 8 by mass.
 (iii) The constituents of the pure substances can be separated by simple physical methods.
 (iv) Milk is a homogeneous mixture.
 (1) (i) and (ii) only (2) (i), (iii) and (iv) only
 (3) Only (i) (4) (i), (ii), (iii) and (iv)

47. Match Column I with column II

Column I (Quantity) Column II (% of oxygen)

- a. Calcium carbonate (i) 28.6
 b. Sodium hydroxide (ii) 40
 c. Quick lime (iii) 48
 d. Glucose (iv) 53.3

Choose the most appropriate match from the options given below:

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

48. Match the List-I with List-II

List-I List-II
 Multiple Prefix

- a. 10^{-21} (i) nano
 b. 10^{-9} (ii) atto
 c. 10^{-24} (iii) yocto
 d. 10^{-18} (iv) zepto

Choose the **correct** option.

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

49. Consider the following statements about Dalton's atomic theory

- (a) Atoms of different elements differ in mass.
 (b) Matter consists of indivisible atoms.
 (c) Atoms are neither created nor destroyed in a chemical reaction.

The correct statements are

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

50. Consider the following statements:

Statement I: Empirical formula for both acetylene and benzene is same.

Statement II: Molecular mass of acetylene = 2.5 times molecular mass of benzene

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

- (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

51. Law of conservation of mass is not applicable for
 (1) Redox reaction (2) Combustion reaction
 (3) Nuclear reaction (4) Neutralisation reaction
52. Number of moles of electron weight 500 g will be (Mass of electron is 9.1×10^{-31} kg)
 (1) 9.1×10^4 (2) 9.1×10^5
 (3) 9.1×10^6 (4) 9.1×10^3
53. The SI unit of thermodynamic temperature and luminous intensity respectively are
 (1) Kelvin and ampere (2) Fahrenheit and candela
 (3) Kelvin and candela (4) $^{\circ}\text{C}$ and ampere
54. Number of Fe atoms in 100 g Haemoglobin if it contains 0.33% Fe by mass is (Atomic mass of Fe = 56 u)
 (1) 0.035×10^{23} (2) 35
 (3) 3.5×10^{23} (4) 7×10^8
55. Suppose the elements A and B combine to form two compounds A_2B and A_2B_3 . When 0.25 mol of A_2B weighs 20 g and 0.1 mol of A_2B_3 weighs 10 g, then the atomic weights (in u) of A and B respectively are
 (1) 35, 20 (2) 20, 25
 (3) 35, 10 (4) 10, 15
56. In 2 molal solution that contains 0.5 mole of solute, there is
 (1) 100 mL of solvent (2) 200 mL of solvent
 (3) 250 g of solvent (4) 300 g of solvent
57. Density of NO_2 gas in g/L at STP will be
 (1) 1.02 (2) 4.5
 (3) 2.05 (4) 3.1
58. 200 ml of 3 M NaOH solution is diluted by 400 ml water. The molarity of the resulting solution is
 (1) 1 M (2) 2 M
 (3) 1.5 M (4) 2.25 M
59. If drinking water contains 10 ppm (by mass) of chloroform, then the concentration in percentage by mass ($\% \frac{w}{w}$) is
 (1) 10^{-2} (2) 10^{-4}
 (3) 10^{-1} (4) 10^{-3}
60. Number of He atoms present in 40 amu of the helium gas is
 (1) 20 (2) 10
 (3) 40 (4) 4
61. If 4 g sample of Na_2CO_3 and MgCO_3 on heating decreases its mass by 0.22 g, then mass of Na_2CO_3 in the sample will be (Na_2CO_3 is thermally stable)
 (1) 3.2 g (2) 2.5 g
 (3) 1.4 g (4) 3.58 g
62. If the density of ethanol sample is 0.8 kg L^{-1} then the volume of ethanol needed to make 2L of 0.2 M aqueous solution is
 (1) 10 mL (2) 18 mL
 (3) 23 mL (4) 28 mL
63. 5.6 L of a triatomic gas at STP weighs 16 g. Number of atoms in 64 g of the gas is (N_A represents Avogadro number)
 (1) N_A (2) $2 N_A$
 (3) $3 N_A$ (4) $4 N_A$
64. The amount of carbon dioxide evolved upon complete combustion of 116 g of n-butane is (Given: atomic mass in amu H = 1, C = 12 and O = 16)
 (1) 176 g (2) 362 g
 (3) 352 g (4) 322 g
65. Mole fraction of solute in aqueous solution of 40% (w/w) of NaOH will be nearly
 (1) 0.18 (2) 0.23
 (3) 0.29 (4) 0.32
66. In which of the following, formula mass is preferred over molecular mass?
 (1) KCl (2) C_2H_6
 (3) N_2 (4) H_2O
67. An element X exist in two isotopic form X^{25} and X^{28} if their percentage abundance is 40% and 60%, respectively, the average atomic mass of X (in u) is
 (1) 25.2 (2) 26
 (3) 27.3 (4) 26.8
68. Consider the following statements:
Statement I: Precision refers to the agreement of a particular value to the true value of the result.
Statement II: Accuracy refers to closeness of various measurements for the same quantity.
 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 incorrect
 (4) Both statement I and statement II are correct
69. The amount of zinc required to produce 1.12 L of H_2 at STP on treatment with dilute HCl will be (Given: Atomic mass of Zn = 65 u)
 (1) 65 g (2) 0.065 g
 (3) 32.5×10^{-4} g (4) 6.5 g
70. Which of the following pairs of compounds follow law of multiple proportions?
 (1) H_2O and Na_2O (2) CO_2 and CO
 (3) CO_2 and NO_2 (4) BaO and BeO
71. 0.0023 can be written in scientific notation as
 (1) 2.3×10^{-3} (2) 23×10^{-4}
 (3) 0.023×10^{-1} (4) 0.23×10^{-2}
72. 2 litres of 0.1 M HCl solution is mixed with another 1 litre of 0.2 M HCl solution. The molarity of the resulting solution will be
 (1) 0.13 M (2) 0.23 M
 (3) 0.31 M (4) 0.47 M
73. Maximum number of significant figures is in
 (1) 0.000010 (2) 0.281
 (3) 4.1×10^6 (4) 0.032
74. Temperature on Fahrenheit scale is 182°F . The same temperature on Celsius scale will be equal to
 (1) 83.3°C (2) 16.6°C
 (3) 270°C (4) 95°C
75. One AVOGRAM is numerically equal to (Given, N_A = Avogadro's number)
 (1) N_A (2) $\frac{1}{N_A}$
 (3) $\frac{1}{N_A}$ (4) $\sqrt{N_A}$
76. The total number of electrons in 4.2 g of N^{3-} ion is (N_A is the Avogadro's number)
 (1) $2.1 N_A$ (2) $4.2 N_A$
 (3) $3 N_A$ (4) $3.2 N_A$

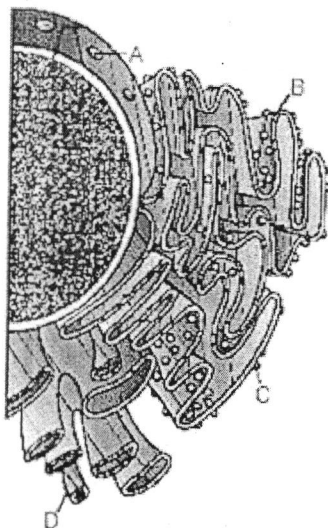
77. In the reaction,
 $4\text{NH}_3(\text{g}) + 5\text{O}_2(\text{g}) \rightarrow 4\text{NO}(\text{g}) + 6\text{H}_2\text{O}(\text{g})$
 When 1.5 moles of ammonia and 2 moles of O_2 are made to react to completion
 (1) 2 moles of H_2O is produced
 (2) 2 moles of NO will produced
 (3) 1.5 moles of H_2O is produced
 (4) 1.5 moles of NO is produced
78. Concentrated aqueous sulphuric acid is 98% H_2SO_4 by mass and has a density of 1.80 g mL^{-1} . Volume of acid required to make one litre of 0.1 M H_2SO_4 solution is
 (1) 16.65 mL (2) 22.20 mL
 (3) 5.55 mL (4) 11.10 mL
79. A mixture of gases contain H_2 and O_3 in the ratio of 1:3 (w/w). The ratio of number of atoms of two gases H_2 and O_3 respectively in the mixture is
 (1) 16:5 (2) 16:1
 (3) 16:3 (4) 16:7
80. In which case the number of carbon atoms will be maximum?
 (1) 112 mL of CO_2 STP (2) 30 g of C_2H_6
 (3) 4.5 g of $\text{H}_2\text{C}_2\text{O}_4$ (4) 13 g of C_2H_2
81. 56 g of nitrogen and 20 g of hydrogen reacts in a closed vessel to form ammonia. Maximum amount of ammonia produced in this reaction is
 (1) 17 g (2) 34 g
 (3) 68 g (4) 51 g
82. Mass of 50% pure CaCO_3 required to produce 5.6 L of CO_2 (g) at S.T.P. is
 (1) 25 g (2) 50 g
 (3) 75 g (4) 100 g
83. 68.4 g of $\text{Al}_2(\text{SO}_4)_3$ is dissolved in enough water to make 500 mL of solution. If aluminium sulphate dissociates completely then molar concentration of aluminium ions (Al^{3+}) and sulphate ions in the solution are respectively (molar mass of $\text{Al}_2(\text{SO}_4)_3 = 342 \text{ g mol}^{-1}$)
 (1) 0.8 M and 1.2 M (2) 0.4 M and 1.2 M
 (3) 0.8 M and 1.6 M (4) 1.2 M and 0.8 M
84. An organic compound containing C, H and O gave the following analysis; C = 40%, H = 6.7%. Its empirical formula would be
 (1) CHO (2) CH_2O
 (3) CH_3O (4) $\text{C}_2\text{H}_6\text{O}$
85. If one molecule of the compound $\text{C}_x\text{H}_y\text{O}_z$ (has C and H in the mass ratio of 6:1) and has $\frac{1}{3}$ rd as much oxygen atom(s) as required to burn one molecule of C_xH_y completely to CO_2 and H_2O . The empirical formula of the compound $\text{C}_x\text{H}_y\text{O}_z$ is
 (1) CH_2O (2) $\text{C}_2\text{H}_4\text{O}_3$
 (3) CH_3O (4) CH_2O_2
86. A compound contains 8% sulphur by mass. Minimum molecular mass of the compound is
 (1) 200 u (2) 400 u
 (3) 600 u (4) 1200 u
87. If 2 mol A and 3 mol B are mixed then mole fraction of B will be
 (1) 0.4 (2) 0.6
 (3) 0.2 (4) 0.8
88. Which of the following is a unitless quantity?
 (1) Normality (2) Molality
 (3) Molarity (4) Mole fraction
89. The concentration term that gets affected by temperature is
 (1) Molality (2) Normality
 (3) Mole fraction (4) (wt/wt) percent
90. The mass of urea required in making 2 kg of 0.2 molal aqueous solution is
 (1) 22.02 g (2) 23.72 g
 (3) 24.22 g (4) 25.50 g

BOTANY

91. Read the following statements regarding Golgi complex and mark the **correct** ones.
 A. It is present near the nucleus of a cell.
 B. The *cis* and *trans* faces of the organelle are entirely different and are not interconnected.
 C. Golgi vacuoles are produced at maturing face.
 D. It is closely associated with ER in structural as well as functional aspects.
 (1) A and B (2) B, C and D
 (3) A, C and D (4) C and D only
92. Read the following statements:
 (A) Different cells have diversity in size, shape and functions.
 (B) The organisation of the prokaryotic cell is fundamentally similar even though prokaryotes exhibit a wide variety of shapes and functions.
 (C) Nerve cells are the longest, unbranched cells of human body.
 (D) The largest isolated single cell is the egg of an ostrich.
 (E) Plasmid DNA is used to monitor bacterial transformation with foreign DNA.
 The **incorrect** one(s) is/are
 (1) Only (D) and (E) (2) Only (C)
 (3) Only (B) (4) Only (A) and (B)
93. Special membranous extension present in the form of vesicle, tubules and lamellae in Gram positive bacteria is called
 (1) Glycocalyx (2) Mesosome
 (3) Capsule (4) Slime layer

94. Satellite in chromosomes is
 (1) Seen in telocentric chromosomes only
 (2) A fragment beyond the secondary constriction
 (3) Formed by primary constriction
 (4) Devoid of DNA
95. Read the given assertion(A) and reason(R) statements and choose the **correct** option.
Assertion : Schleiden and Schwann were the first to observe the cells and to put forward the cell theory.
Reason : Schleiden and Schwann first explained that cells divided and new cells are formed from pre-existing cells.
 (1) Both the assertion and the reason are true and reason is the correct explanation of the assertion.
 (2) Both the assertion and the reason are true but reason is not the correct explanation of the assertion.
 (3) Assertion is true but reason is false
 (4) Both assertion and reason are false
96. Select the **incorrect** match w.r.t. various cells and their shape.
 (1) Red blood cells – Round and biconcave
 (2) White blood cells – Amoeboid
 (3) Tracheid – Round and oval
 (4) Columnar epithelial cells – Long and narrow
97. Select the statement which is **not** true for the cell organelle first observed by George Palade.
 (1) These are composed of RNA and proteins
 (2) In eukaryotes, these organelles are composed of 60S and 40S subunits only
 (3) These organelles are also found in bacteria
 (4) These are not surrounded by any membrane
98. Match the following columns and select the **correct** option.
- | Column-I | Column-II |
|----------------|---------------------------|
| a. Elaioplast | (i) Store proteins |
| b. Aleuroplast | (ii) Colourless plastids |
| c. Chromoplast | (iii) Store fats and oils |
| d. Leucoplast | (iv) Carotenoid pigments |
- (1) a(iv), b(iii), c(i), d(ii) (2) a(iii), b(i), c(iv), d(ii)
 (3) a(ii), b(iv), c(iii), d(i) (4) a(i), b(ii), c(iv), d(iii)
99. According to the Singer and Nicolson's model of plasma membrane
 (1) The membrane appears as lipid icebergs floating in sea of proteins
 (2) It has 52 percent lipids and 40 percent proteins but lacks cholesterol entirely
 (3) The quasi-fluid nature of lipids enables lateral movement of proteins within the overall bilayer
 (4) Polar tail of unsaturated hydrocarbons is protected from the aqueous environment
100. Consider the following statements of **Assertion** and **Reason** and select the **correct** option.
Assertion : Microbodies are single membrane bound minute vesicles.
Reason : Microbodies are found in plant cells only.
 (1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
 (2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
 (3) Assertion is true statement but Reason is false
 (4) Both Assertion and Reason are false statements
101. The main arena of cellular activities
 (1) Is cytoplasm in both prokaryotic and eukaryotic cells
 (2) Does not involve the synthesis of ATP
 (3) Is the semifluid liquid found in the nucleus
 (4) Is the cytosol which is found only in unicellular organisms
102. A vacuole
 (1) Is found in plants only
 (2) Is a membrane bound structure, found in prokaryotes
 (3) Is bounded by a single semi-permeable membrane in plants
 (4) Always has lower concentration of ions and other materials than in the cytoplasm
103. Select the **incorrect** statement for nucleolus.
 (1) It is a spherical structure.
 (2) It is larger and more numerous in cells that are actively involved in protein synthesis.
 (3) It is a site for active ribosomal RNA synthesis.
 (4) It is found inside the nucleoplasm and is a membrane bound structure.
104. Polysomes found in prokaryotes are
 (1) Ribosomes bound to their plasma membrane
 (2) Several ribosomes attached to a single mRNA
 (3) Several ribosomes attached to the nucleus
 (4) Inclusion bodies, surrounded by a single layer
105. Select the **true** statement for centrioles.
 (1) Nine radial spokes are found
 (2) There are eighteen peripheral doublets
 (3) Central hub contains a pair of microtubules
 (4) Central sheath surrounds the central doublet
106. Inclusion bodies
 (1) Are found only in eukaryotes
 (2) Are the forms of stored reserve material
 (3) Are double membrane bound
 (4) Include vacuole with a tonoplast
107. Choose the **incorrect** statement about mitochondria.
 (1) Site of anaerobic respiration
 (2) Produce cellular energy in the form of ATP
 (3) Are called 'power house' of cell
 (4) Possess single circular DNA molecule in their matrix
108. Which among the following is **correct** for the mechanism responsible for exchanging sodium and potassium ions across the plasma membrane?
 (1) The process requires expenditure of cellular energy
 (2) This type of transport occurs without the involvement of carrier protein
 (3) The ions move passively from higher to lower concentration
 (4) All the molecules which are chemically charged are transported through this
109. Which of the following is/are associated with blue-green algae?
 (a) Chromatophores
 (b) Gas vacuoles
 (c) Nucleoid
 (1) Only (c) (2) Only (b) and (c)
 (3) Only (a) and (c) (4) All (a), (b) & (c)

110. Identify the correctly matched pair w.r.t the given diagram.



- (1) A – Controls unidirectional movement of RNA and proteins
 (2) B – Major site for synthesis of lipid
 (3) C – RNA and protein particles
 (4) D – Frequently observed in cells actively involved in protein synthesis and secretion
111. The function which is **not** associated with microtubules is
 (1) Formation of spindles and astral rays
 (2) Formation of cytoskeleton of flagella in eukaryotes
 (3) Help in formation of cleavage furrow during cell division
 (4) Determining the position of cell plate during plant cell cytokinesis
112. Cell wall is
 (1) A living rigid structure found in the plant cells
 (2) The outer covering of the plasma membrane of all eukaryotic organisms
 (3) Capable of growth and expansion in young plant cell
 (4) A barrier to macromolecule but does not protect from infection.
113. Cytoskeleton is directly involved in
 (1) Motility of cell
 (2) Starch synthesis
 (3) Carrying genetic informations
 (4) Protein synthesis
114. Small bristle like fibres sprouting out of the bacterial cells are helpful in
 (1) Cell wall formation
 (2) Attachment to the host tissue
 (3) Secretion process
 (4) Cell motility
115. The major function of contractile vacuole is
 (1) ATP synthesis
 (2) Nitrogen fixation
 (3) Osmoregulation
 (4) Protein synthesis
116. Basal body of cilia and flagella in eukaryotes is formed by
 (1) Mesosomes
 (2) Centrioles
 (3) Lysosomes
 (4) Golgi apparatus
117. One of the major components of bacterial cell wall is
 (1) Peptidoglycan
 (2) Cellulose
 (3) Chitin
 (4) Phospholipids
118. When a chromosome has centromere slightly away from the middle of chromosome, then it will be called
 (1) Telocentric chromosomes
 (2) Metacentric chromosomes
 (3) Submetacentric chromosomes
 (4) Acrocentric chromosomes
119. A flattened membranous sac in a chloroplast is called a
 (1) Cristae
 (2) Thylakoid
 (3) Stroma
 (4) Glyoxysome
120. The unconnected units of Golgi apparatus in plants is called as
 (1) Dictyosome
 (2) Ribosome
 (3) Cristae
 (4) Microbodies
121. Secondary constriction is
 (1) Non staining region of chromosome
 (2) Also called centromere
 (3) Found in all chromosomes
 (4) Seen in humans only
122. Which of the following structures is found in the golgi complex?
 (1) Cristae
 (2) Cisternae
 (3) Thylakoid
 (4) Oxsomes
123. Select the odd one w.r.t. organelles of endomembrane system.
 (1) Endoplasmic reticulum
 (2) Golgi bodies
 (3) Lysosome
 (4) Mitochondria
124. In plant cells, cytoplasm of neighbouring cells are connected by
 (1) Middle lamellae
 (2) Plasmodesmata
 (3) Cell wall
 (4) Primary wall
125. Steroidal hormones are synthesised in which of the following cell organelle of the animal cells?
 (1) RER
 (2) SER
 (3) Golgi apparatus
 (4) Lysosomes
126. Mycoplasma
 (1) Is a eukaryote
 (2) Is the smallest cell
 (3) Lacks double stranded DNA
 (4) Is devoid of nucleoid
127. Which layer of the cell envelope prevents the bacterium from bursting or collapsing?
 (1) Plasma membrane
 (2) Glycocalyx
 (3) Cell wall
 (4) Capsule
128. The major role of golgi bodies in a cell is
 (1) Fermentation
 (2) Photophosphorylation
 (3) Glycosylation of proteins
 (4) Translocation
129. The outermost layer of a plant cell is
 (1) Glycocalyx
 (2) Cell membrane
 (3) Tonoplast
 (4) Cell wall
130. Ribosomes of mitochondria in animal cells are consist of
 (1) 60S and 40S subunits
 (2) 50S and 30S subunits
 (3) 60S and 30S subunits
 (4) 30S and 40S subunits
131. Chromatin contains
 (a) DNA
 (b) Histone proteins
 (c) RNA
 (d) Non-histone proteins
 (1) (a) & (b) only
 (2) (a), (b) & (d) only
 (3) (a), (b) & (c) only
 (4) All (a), (b), (c) & (d)
132. Choose the function which is **not** performed by mesosomes.
 (1) Cell wall formation
 (2) DNA replication
 (3) Secretion
 (4) Photosynthesis

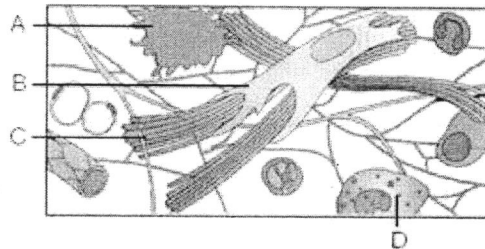
133. When glycocalyx is thick and tough, it is called
 (1) Capsule (2) Slime layer
 (3) Cell wall (4) Cell membrane
134. One chloroplast per cell is found in
 (1) *Chlamydomonas* (2) Mesophyll cells
 (3) Guard cells (4) Fungal cells

135. Algal cell wall is composed of
 (a) Galactans
 (b) Calcium carbonate
 (c) Mannans
 (d) Cellulose
 The correct one(s) is/are
 (1) All (a), (b), (c) and (d) (2) Only (d)
 (3) Only (a), (c) and (d) (4) Only (a) and (c)

ZOOLOGY

136. The structure responsible for attaching one bone to another bone is
 (1) Ligament (2) Tendon
 (3) Cartilage (4) Haversian canal
137. Consider the given statements and select the option representing the **incorrect** ones only.
 (a) Some formed elements of blood are specialised to store fats.
 (b) Each muscle is made up of myofibrils that are composed of long cylindrical muscle fibres.
 (c) Bones support and protect softer tissues and organs.
 (d) Only RBCs and WBCs are present in the main circulating fluid of the body.
 (1) (a), (b), (c) and (d) (2) (a), (b) and (c) only
 (3) (a), (b) and (d) only (4) (b), (c) and (d) only
138. In humans, the specialised tissue with solid matrix, found in the tip of the nose, is also found in/between
 (1) Adipose tissue
 (2) Adjacent bones of vertebral column
 (3) Tendons
 (4) Ligaments
139. Which tissue exerts the greatest control over the body's responsiveness to changing conditions?
 (1) Muscle tissue (2) Neural tissue
 (3) Connective tissue (4) Epithelial tissue
140. **Assertion (A)** : Ciliated epithelium helps in movement of particles.
Reason (R) : Its cells contain microscopic and hair-like projections called cilia that beat in a synchronized, rhythmic wave-like motion.
 In the light of above given statements, choose the correct option
 (1) Both the assertion and the reason are true and the reason is the correct explanation of the assertion
 (2) Both the assertion and reason are true but the reason is not the correct explanation of the assertion
 (3) Assertion is true but reason is false
 (4) Assertion is false but reason is true

141. Given below is the diagram of loose connective tissue. Identify A, B, C, D and choose the **correct** option



A	B	C	D
(1) Mast cell	Collagen fibres	Fibroblast	Macrophage
(2) Collagen	Fibroblast	Macrophage	Mast cell
(3) Fibroblast	Macrophage	Collagen fibres	Mast cell
(4) Macrophage	Fibroblast	Collagen fibres	Mast cell
(1) (1)		(2) (2)	
(3) (3)		(4) (4)	

142. Cylindrical, unbranched fibres with peripheral nuclei are present in
 (1) Smooth muscles (2) Skeletal muscles
 (3) Cardiac muscles (4) Visceral muscles
143. The arrival of an electrical impulse at a neuron's ending may cause
 (1) Only stimulation of adjacent neurons and other cells
 (2) Only inhibition of adjacent neurons and other cells
 (3) Only degradation of neurotransmitters
 (4) Either stimulation or inhibition of adjacent neurons and other cells

144. Complete the analogy by selecting the correct option.
 Bone : Skeletal connective tissue :: Blood : _____
 (1) Dense connective tissue
 (2) Fluid connective tissue
 (3) Loose connective tissue
 (4) Skeletal connective tissue

145. How many of following is/are included in the category of dense connective tissues?
 (a) Areolar tissue
 (b) Adipose tissue
 (c) Tendon
 (d) Ligament
 Select the correct option.
 (1) One (2) Two
 (3) Three (4) Four

146. Connective tissue characterized by solid and pliable matrix and the presence of lacunae and absence of canaliculi is
 (1) Cartilage (2) Bone
 (3) Adipose (4) Areolar
147. Which of the following animals exhibit division of labour at the tissue level?
 (1) *Hydra* (2) *Amoeba*
 (3) *Euglena* (4) *Paramecium*
148. In humans, an epithelial tissue which has thin and flat cells arranged edge to edge so as to appear like closely packed tiles, is found in the
 (1) Inner lining of stomach
 (2) Air sacs of lungs
 (3) Outer surface of ovary
 (4) Inner lining of fallopian tube
149. The cell junctions which perform cementing to keep neighbouring cells together is called
 (1) Adhering junction (2) Communication junction
 (3) Gap junction (4) Leaky junction
150. In all connective tissues, the cells secrete fibres of structural proteins called collagen or elastin, **except**
 (1) Loose connective tissue
 (2) Dense connective tissue
 (3) Skeletal connective tissue
 (4) Fluid connective tissue
151. In humans, the GIT is characterised by the presence of
 (a) Epithelial tissue
 (b) Connective tissue
 (c) Muscular tissue
 (d) Neural tissue
 Choose the **correct** option.
 (1) (a), (b) and (c) only (2) (b) and (c) only
 (3) (a), (c) and (d) only (4) (a), (b), (c) and (d)
152. Cuboidal epithelium is **not** present in
 (1) Fallopian tubes (2) PCT of nephron
 (3) Ducts of glands (4) DCT of nephron
153. The tissue with loosely arranged matrix and which also serves as a support framework for epithelium is
 (1) Cardiac muscle (2) Skeletal muscle tissue
 (3) Loose connective tissue (4) Dense connective tissue
154. All of the following cells are found in the areolar tissue, except
 (1) Fibroblasts (2) Macrophages
 (3) Mast cells (4) Chondrocytes
155. Which of the following cells do not form any layer but remain structurally separate?
 (1) Gland cells
 (2) Compound epithelial cells
 (3) Simple epithelial cells
 (4) Nerve cells
156. Complete the analogy by selecting the correct option.
 Drug : Curcumin :: Alkaloid : _____
 (1) Anthocyanin (2) Morphine
 (3) Cellulose (4) Concanavalin A
157. Choose the **incorrect** statement.
 (1) If a DNA sample was composed of 10% thymine, then the percentage of guanine would also be 10%.
 (2) DNA nucleotides contain a different sugar than RNA nucleotides.
 (3) If one strand of a dsDNA molecule has the sequence of bases 5'ATTGCA3', the other complementary strand would have the sequence 3'TAACGT5'.
 (4) The 5' end of a polynucleotide strand of a nucleic acid has a phosphate group attached to the 5th carbon of the terminal sugar (ribose).
158. **Assertion (A)** : Saturated fatty acids have melting point higher than unsaturated fatty acids.
Reason (R) : Saturated fatty acids possess double bonds in their carbon chains.
 In the light of above statements, choose the correct option.
 (1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
 (2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
 (3) Assertion is true statement but Reason is false
 (4) Both Assertion and Reason are false statements
159. Haem, in enzyme catalase, can be best described as
 (1) Loosely bound co-enzyme
 (2) Loosely bound prosthetic group
 (3) Tightly bound co-enzyme
 (4) Tightly bound prosthetic group
160. An enzyme with EC number 2.5.1.2 belongs to the class named
 (1) Oxidoreductases (2) Isomerases
 (3) Hydrolases (4) Transferases
161. Which of the following is **not** a storage polysaccharide?
 (1) Starch (2) Glycogen
 (3) Inulin (4) Cellulose
162. A student claims:
 "Every monosaccharide must satisfy the empirical formula $(CH_2O)_n$ because carbohydrates are hydrates of carbon."
 The above given fact is
 (1) Correct, as all monosaccharides have different structures but possess the same empirical formula
 (2) Incorrect, as some oligosaccharides like ribose form a cyclic conformation
 (3) Correct, as in all sugars, the ratio of C:H:O is 2:2:1
 (4) Incorrect, as a pentose sugar present in the structure of DNA deviates from this empirical formula
163. All of the following are incorrect statements, **except**
 (1) Oils have higher melting point as compared to fats.
 (2) Only one heterocyclic ring is present in the structure of substituted purines.
 (3) Both trypsin and collagen are heteropolymers of amino acids.
 (4) Glucose is the monomeric unit of the structural polysaccharide present in the exoskeleton of arthropods.
164. The _____ sugar present in RNA is ribose and the one which is present in DNA is _____.
 Fill in the respective blanks with the correct option.
 (1) Pentose, 3' (2) Hexose, 3'
 Deoxyribose Deoxyribose
 (3) Pentose, 2' (4) Hexose, 2'
 Deoxyribose Deoxyribose

165. Match the column I with column II and choose the **correct** answer with respect to percentage weight of elements present in Earth's crust.

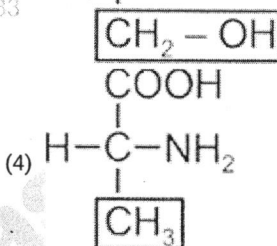
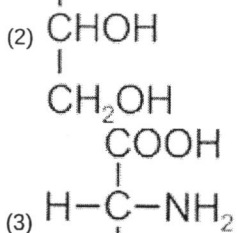
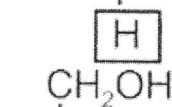
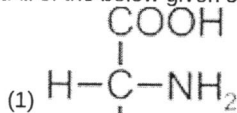
	Column I		Column II
a.	Hydrogen	(i)	Very little
b.	Sulphur	(ii)	46.6%
c.	Nitrogen	(iii)	0.14%
d.	Oxygen	(iv)	0.03%
e.	Silicon	(v)	27.7%

- (1) a(iv), b(ii), c(iii), d(v), e(i) (2) a(iii), b(iv), c(ii), d(i), e(v)
 (3) a(ii), b(iv), c(i), d(iii), e(v) (4) a(iii), b(iv), c(i), d(ii), e(v)
166. Formation of peptide bond involves
 (1) Carboxyl and phosphate group
 (2) Phosphate and hydroxyl group
 (3) Amino and hydroxyl group
 (4) Amino and carboxyl group
167. Nucleoside is made up of
 (1) Pentose sugar only
 (2) Phosphate only
 (3) Hexose sugar and phosphate
 (4) Pentose sugar and nitrogenous base
168. RuBisCO is a CC-483
 (1) Carbohydrate (2) Lipid
 (3) Protein (4) Nucleic acid
169. Which statement is **correct** for biomolecules?
 (1) All carbohydrates break down into glucose
 (2) The primary structure of a protein determines the sequence of its amino acids
 (3) RNA is single stranded and contains the same nitrogenous bases as present in DNA
 (4) Lipids are strictly macromolecules that are formed by esterification of fatty acid with glycerol/alcohol
170. Upon chemical analysis of a living tissue, the compounds with molecular weight ranging from 18 to 800 Daltons approx., were observed in the filtrate that represents roughly
 (1) Cell organelles only
 (2) Nuclear composition only
 (3) Cytoplasmic composition
 (4) Cell membrane and outer membranes only
171. The components of a lecithin molecule are all of the following, **except**
 (1) Nitrogen containing compound
 (2) Glycerol
 (3) Fatty acids
 (4) Cholesterol
172. Carbonic anhydrase accelerates the rate of conversion of CO_2 and H_2O into H_2CO_3 by about
 (1) 100 million times (2) 10 million times
 (3) 40 million times (4) 50 million times
173. Choose the **odd** one w.r.t. the products of glands released through tubes or ducts.
 (1) Earwax (2) Milk
 (3) Mucus (4) Insulin

174. Which of the following is normally **not** a component of ribonucleic acid?

- (1) Adenylic acid (2) Thymidylic acid
 (3) Uridine monophosphate (4) Cytidine monophosphate

175. All of the below given structures are of amino acids, **except**



176. In primary structure of a protein, the first amino acid is called A amino acid and the last amino acid is called B amino acid.

Choose the option that correctly fills the blanks A and B.

	A	B
(1)	C-terminal	N-terminal
(2)	C-terminal	S-terminal
(3)	N terminal	C-terminal
(4)	N-terminal	S-terminal

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

177. Polymer of glucose which is stored in animals is

- (1) Glucosamine (2) Glycogen
 (3) Galactosamine (4) N-acetyl galactosamine

178. All of the following are nucleosides, **except**

- CC-483 (1) Adenosine (2) Guanosine CC-483
 (3) Cytosine (4) Thymidine

179. Which structure of protein is absolutely necessary for biological activity?

- (1) Primary structure (2) Secondary structure
 (3) Tertiary structure (4) Quaternary structure

180. Among secondary metabolites, codeine belongs to the

- (1) Pigments (2) Alkaloids
 (3) Terpenoids (4) Toxins