NBTS

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MM : 720 **Time : 3.00 Hrs**

NCERT Booster Test Series

(*for* NEET-2022)

Test – 5

Topics covered :

Physics : Gravitation, Mechanical Properties of Solids, Mechanical Properties of Fluids, Thermal Properties of Matter

Chemistry : Equilibrium, Redox Reactions, Hydrogen, The *s*-block elements

Botany : Anatomy of Flowering Plant, Plant Kingdom.

Zoology : Locomotion and Movement, Neural Control and Coordination, Chemical Coordination and Integration.

Instructions :

(i) There are two sections in each subject, i.e. Section-A & Section-B. You have to attempt all 35 questions from Section-A & only 10 questions from Section-B out of 15.

(ii) 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.

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

(iv) Mark should be dark and completely fill the circle.

(v) Dark only one circle for each entry.

(vi) Dark the circle in the space provided only.

(vii) 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

Choose the correct answer :

SECTION-A

1. A wooden block of mass 100 g and volume 200 cm^3 is floating in water (density 1000 kg/m^3). The fraction of volume that remains submerged in water is

(1) $\frac{1}{2}$ (2) 1

(3) $\frac{1}{4}$ (4) $\frac{1}{8}$

2. In a hydraulic lift at a service station, the radii of the large and small pistons are in ratio 10 : 1. What weight placed on the small piston will be sufficient to lift a car of mass 1500 kg?

(1) 15000 kg

(2) 150 kg

(3) 15 kg

(4) 30 kg

3. The two thigh bones (femurs), each of cross-sectional area 10 cm^2 support the upper part of a human body of mass 60 kg. Estimate the average pressure sustained by femurs.

(g = 10 m/s^2)

(1) 6×10^5 N/m^2

(2) 8×10^6 N/m^2

(3) 3×10^5 N/m^2

(4) 8×10^5 N/m^2

4. What is the total pressure on a swimmer 20 m below the surface of a lake? (Atmospheric Pressure : 10^5 Pa)

(1) 2×10^5 Pa

(2) 1×10^5 Pa

(3) 4×10^5 Pa

(4) 3×10^5 Pa

5. The Bernoulli's theorem is based on the principle of

(1) Conservation of Momentum

(2) Conservation of Angular Momentum

(3) Conservation of Energy

(4) Conservation of Charge

6. A fully loaded Airbus A330 has a mass of 1,20,000 kg. The total wing area of the aircraft is equal to 400 m^2. Find the pressure difference between the lower and upper surface of the wings, when the aircraft is in level flight at a speed of 1000 km/h.

(1) 3000 N/m^2 (2) 2000 N/m^2

(3) 1000 N/m^2 (4) 6000 N/m^2

7. The terminal velocity of a copper ball of radius 5.0 mm falling through a tank of oil at 30°C is 8 cm/s. It is known that the density of oil is 1.5 × 10^3 kg/m^3 and that of copper is 8 × 10^3 kg/m^3. Compute the coefficient of viscosity of oil at 30°C.

(1) 4.5 kg $m^{-1}s^{-1}$

(2) 9.9 kg $m^{-1}s^{-1}$

(3) 6.81×10^{-2} kg $m^{-1}s^{-1}$

(4) 2.41×10^{-2} kg $m^{-1}s^{-1}$

8. During blood transfusion, the needle is inserted in a vein where the gauge pressure is 3000 Pa. At what height must the blood container be placed so that blood may just enter the vein?

[g = 10 m/s^2]

(Density of whole blood = 1.06 × 10^3 kg/m^3)

(1) 0.162 m (2) 0.283 m

(3) 0.342 m (4) 0.562 m

9. For a rectangular sheet of homogeneous solid, the ratio of coefficient of area expansion to its linear expansivity is

(1) 2 : 1 (2) 1 : 4

(3) 3 : 1 (4) 1 : 1

10. The amount of heat required to raise the temperature of 2 kg water from 10°C to 30°C is (Specific heat capacity of water = 1 cal/g; 1 cal = 4.2 J)

(1) 168 kJ (2) 40 kcal

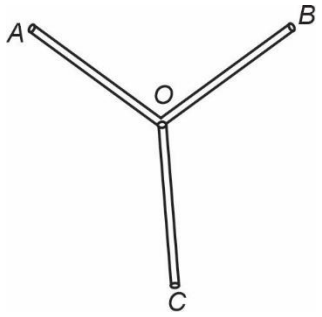
(3) 168.3 cal (4) Both (1) and (2)

11. When 200 g of ice at 0°C is mixed with 400 g of water at 40°C, then the final resulting temperature is

(1) 20°C (2) 30°C

(3) 10°C (4) 0°C

12. In the following arrangement of identical rods, the temperature of ends A, B and C are 10°C, 10°C and 20°C respectively. The temperature of the junction O will be nearly



(1) 20°C (2) 13.3°C

(3) 10°C (4) 15.9°C

13. Which among the following is a mode of heat transfer by actual motion of matter?

(1) Radiation (2) Conduction

(3) Convection (4) Both (1) and (3)

14. The radiative power emitted by a black body at temperature T is P. If the temperature now increased by a value $2T$, then the new power radiated will be

(1) $16P$ (2) $28P$

(3) $81P$ (4) $99P$

15. Two equal drops of water, each of radius r are falling through air with a steady speed of v. If the two drops combine to form a big drop, then the steady speed of the new big drop will be

(1) $2v$ (2) $4v$

(3) $2^{\frac{1}{3}}v$ (4) $2^{\frac{2}{3}}v$

16. According to Kepler, the period of revolution of planet (T) and its about semi-major axis the sun (R) are related by the equation

(1) T^2R^3 = Constant (2) T^2R^{-3} = Constant

(3) TR^3 = Constant (4) T^2R = Constant

17. If 'A' is the areal velocity of planet of mass M, its angular momentum is

(1) $\frac{M}{A}$ (2) $2MA$

(3) A^2M (4) AM

18. Three spherical balls of masses 1 kg, 2 kg and 3 kg are placed at the corners of an equilateral triangle of side 1 m. The magnitude of net gravitational force exerted by 2 kg and 3 kg masses on 1 kg mass is

(1) $19G$ (2) $\sqrt{17}\,G$

(3) $\sqrt{19}\,G$ (4) $\frac{G}{\sqrt{17}}$

19. Match the items in column I with those in column II.

	Column I		**Column II**
(A)	Universal gravitational constant	(P)	Central force
(B)	Gravitational force	(Q)	Scalar
(C)	'g' at equator	(R)	Does not change, if earth stops rotating
(D)	'g' at pole	(S)	Increases by $R\omega^2$ if earth stops rotating

(1) A $\rightarrow$ R, B $\rightarrow$ P, C $\rightarrow$ S, D $\rightarrow$ Q

(2) A $\rightarrow$ S, B $\rightarrow$ P, C $\rightarrow$ R, D $\rightarrow$ Q

(3) A $\rightarrow$ Q, B $\rightarrow$ R, C $\rightarrow$ S, D $\rightarrow$ P

(4) A $\rightarrow$ Q, B $\rightarrow$ P, C $\rightarrow$ S, D $\rightarrow$ R

20. If three particles each of mass m are placed at the three corners of an equilateral triangle of side a, then work done to increase the side of that triangle to $\frac{3a}{2}$ is

(1) $\frac{Gm^2}{a}$ (2) $\frac{2Gm^2}{3a}$

(3) $\frac{Gm^2}{3a}$ (4) $\frac{Gm^2}{2a}$

21. Two satellites of masses 60 kg and 120 kg revolve around the earth in circular orbits of radii $9R$ and $16R$ respectively, where R is the radius of the earth. The speed of two satellites is in the ratio

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

(3) $\frac{9}{16}$ (4) $\frac{16}{9}$

22. An artificial satellite moving in a circular orbit around the earth has the total energy E_0, its potential energy is

(1) $2E_0$ (2) $\frac{3E_0}{2}$

(3) E_0 (4) $\frac{E_0}{2}$

23. The period of geostationary satellite of earth is

(1) 24 hr (2) 48 hr

(3) 12 hr (4) 18 hr

24. If the change in the value of g at a height h above the surface of the earth is same as at depth 'X' below the surface of the earth, then ($h << R$)

(1) $X = h$

(2) $X = h^2$

(3) $X = 2h$

(4) $X = \frac{h}{2}$

25. The escape velocities on the surface of two planets of masses m_1 and m_2 and having the radius r_1 and r_2 are V_1 and V_2 respectively, then

(1) $\frac{V_1}{V_2} = \frac{m_1 r_1}{m_2 r_2}$ (2) $\frac{V_2}{V_1} = \frac{m_1 r_1}{m_2 r_2}$

(3) $\frac{V_2}{V_1} = \sqrt{\frac{m_2 r_1}{m_1 r_2}}$ (4) $\frac{V_2}{V_1} = \sqrt{\frac{m_1 r_1}{m_2 r_2}}$

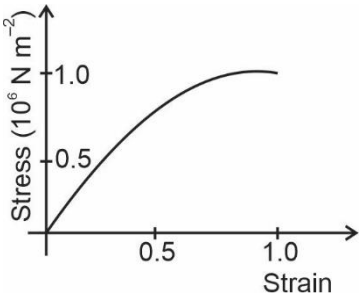
26. Hooke's law essentially defines

(1) Proportional limit (2) Strain

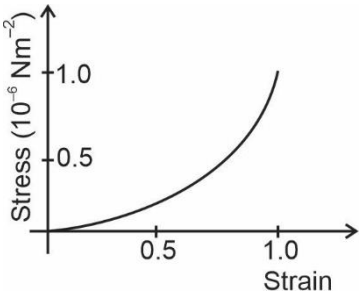
(3) Yield point (4) Stress

27. Which among the following is correct stress-strain curve for the elastic tissue of aorta, the large tube (vessel) carrying blood from the heart?

(1)



(2)



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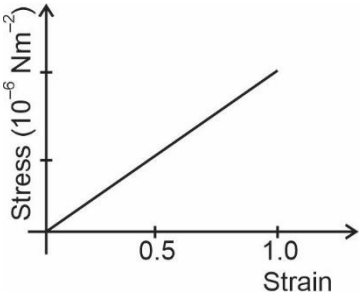

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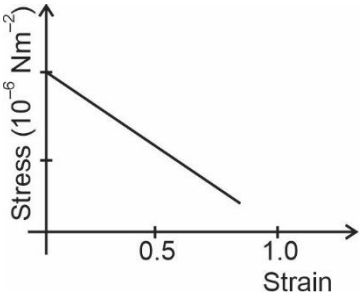


28. Solids, which break or rupture immediately beyond ultimate tensile stress are classified as

(1) Brittle (2) Ductile

(3) Malleable (4) Elastic

29. The Poisson's ratio for steel is nearly

(1) 0.50 (2) 0.30

(3) 0.10 (4) 0.40

30. Elastic potential energy stored per unit volume in a stretched wire is

(1) $\frac{1}{2}$ load × strain

(2) Load × strain

(3) Stress × strain

(4) $\frac{1}{2}$ stress × strain

31. A sphere decreases in volume by 0.02% under a pressure of 10^8 Pa. The bulk modulus of material of the sphere will be

(1) 10^{12} Pa (2) 5×10^{11} Pa

(3) 5×10^{10} Pa (4) 5×10^{12} Pa

32. For most materials, the ratio of modulus of rigidity to the Young's modulus will be

(1) 1 : 1 (2) 1 : 3

(3) 1 : 2 (4) 2 : 3

33. A wire of length L and radius r is fixed at one end and a force F applied at the other end produced an extension y. The extension produced in another wire of the same material of length $2L$ and radius $2r$ by a force $2F$ will be

(1) y (2) $2y$

(3) $\frac{y}{2}$ (4) $\frac{y}{4}$

34. A tensile force of 2×10^5 dynes increases the length of an imaginary elastic cord to double its length. If area of cross-section is 2 cm^2. The Young's modulus of material of the cord will be (in dynes/cm^2)

(1) 10^3 (2) 10^7

(3) 10^5 (4) 10^{11}

35. A mild steel wire of length 1.0 m and cross-sectional area 0.50×10^{-2} cm^2 is stretched, well within its elastic limit, horizontally between two pillars. A mass of 100 g is suspended from the mid-point of the wire. The depression at mid-point of the wire will be nearly ($Y = 2 \times 10^{11}$ Pa)

(1) 0.1 m (2) 0.2 m

(3) 0.01 m (4) 0.02 m

SECTION-B

36. A steel wire 4 m long and 2×10^{-7} m^2 in cross-section is stretched by a force of 30 N. If $Y = 2 \times 10^{11}$ Pa, then potential energy stored in the wire will be

(1) 8 mJ (2) 45 mJ

(3) 10 mJ (4) 20 mJ

37. Which among the following substance has the highest elasticity?

(1) Steel (2) Copper

(3) Rubber (4) Sponge

38. The strain which changes the shape of the body is

(1) Shearing strain (2) Longitudinal strain

(3) Volumetric strain (4) None of these

39. In considering motion of an object under the gravitational influence of another object, which of the following quantities is/are conserved?

(1) Total mechanical energy

(2) Linear momentum

(3) Angular momentum

(4) Both (1) and (3)

40. Which of the following symptoms is not likely to afflict an astronaut in space?

(1) Swollen feet (2) Swollen face

(3) Orientation problem (4) Headache

41. An infinite number of masses, each of 1 kg are placed on the positive x-axis at 1 m, 2 m, 4 m, 8 m…. from origin. The magnitude of resultant gravitational force on 1 kg mass kept at origin will be

(1) $2G$ (2) $\frac{2G}{3}$

(3) G (4) $\frac{4G}{3}$

42. The minimum work done to move a satellite of mass m revolving around the planet of mass M from altitude $3R$ to infinity will be

(R is the radius of the planet)

(1) $\frac{GMm}{3R}$

(2) $\frac{GMm}{8R}$

(3) $\frac{GMm}{R}$

(4) $\frac{GMm}{2R}$

43. The Young's modulus and shear modulus holds relevance for

(1) Solids (2) Liquids

(3) Gases (4) Both (1) and (2)

44. The dimensional formula for the gravitational potential is

(1) $[M^{-1}L^3T^{-2}]$ (2) $[ML^2T^{-2}]$

(3) $[L^2T^{-2}]$ (4) $[LT^{-2}]$

45. A mercury barometer reads 75 cm. If the tube be inclined by 37° from the vertical, then the length of the mercury in the tube will be

(1) 93.75 cm (2) 75 cm

(3) 60.8 cm (4) 70 cm

46. A liquid of density d has a column height equal to h. Another liquid of density $2d$ has a column height $3h$. The ratio of gauge pressures at the bottom of both the columns is

(1) 1 : 1

(2) 2 : 1

(3) 1 : 6

(4) 1 : 8

47. Hot water cools from 50°C to 40°C in the first 5 minutes and from 40°C to 30°C in next 10 minutes. The temperature of the surrounding will be

(1) 10°C

(2) 39°C

(3) 46°C

(4) 25°C

48. Two rods of different materials having different lengths and same cross-sectional areas are joined end to end in a straight line. The free ends of this compound rod are maintained at different temperatures. The temperature gradient in each rod will be

(1) Same

(2) Zero

(3) Directly proportional to the thermal conductivity of the respective rod

(4) Inversely proportional to the thermal conductivity of the respective rod

49. Two liquids *A* and *B* are at initial temperatures 30°C and 50°C. When mixed in equal masses, then the final temperature of the mixture is found to be 42°C. The ratio of specific heat of liquid *B* to that of liquid *A* is

(1) 2 : 3 (2) 1 : 6

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

50. On the Fahrenheit scale, the absolute zero of temperature is at

(1) – 300°F (2) – 459.67°F

(3) – 101.2°F (4) 273°F

CHEMISTRY

SECTION-A

51. The pH of 0.05 M $Ca(OH)_2$(aq.) solution will be

(1) 1 (2) 9

(3) 7.01 (4) 13

52. Which of the following can act both as Bronsted acid and Bronsted base?

(1) $H_2PO_3^-$ (2) HPO_3^{2-}

(3) H_3PO_4 (4) $H_2PO_2^-$

53. The molar solubility of PbS in 0.1 M Na_2S is (K_{sp} (PbS) = 8×10^{-28})

(1) 8×10^{-14} (2) 2.82×10^{-14}

(3) 8×10^{-27} (4) 2.82×10^{-28}

54. Which one of the following conditions will favour maximum formation of product in the reaction, theoretically?

$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$

$\Delta_r H$ = – 92.38 kJ mol^{-1}

(1) High temperature and high pressure

(2) High temperature and low pressure

(3) Optimum temperature and high pressure

(4) Optimum temperature and low pressure

55. The equilibrium constants of the following are:

$A + 2B \rightleftharpoons C$; K_1

$C + 2D \rightleftharpoons 2E$; K_2

$A + F \rightleftharpoons E$; K_3

The equilibrium constant (K) of the reaction $A + 2F \rightleftharpoons 2B + 2D$ will be

(1) $\frac{K_1K_2}{K_3}$ (2) $\frac{K_1K_2}{K_3^2}$

(3) $\frac{K_3}{K_1K_2}$ (4) $\frac{K_3^2}{K_1K_2}$

56. K_c is not equal to K_p for which of the following reaction?

(1) $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$

(2) $CH_4(g) + 2O_2(g) \rightleftharpoons CO_2(g) + 2H_2O(g)$

(3) $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$

(4) $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$

57. Conjugate acid of H_2O is

(1) H^+ (2) H_3O^+

(3) OH^- (4) O^{2-}

58. Correct order of acidic strength is

(1) $CH_4 < H_2O < NH_3 < HF$

(2) $NH_3 < CH_4 < H_2O < HF$

(3) $NH_3 < H_2O < CH_4 < HF$

(4) $CH_4 < NH_3 < H_2O < HF$

59. If molar solubility of Ag_2SO_4 is S M then K_{sp} of Ag_2SO_4 will be

(1) S^3 (2) $4S^2$

(3) $9S^3$ (4) $4S^3$

60. For the equilibrium $A + B \rightleftharpoons 2C$, equilibrium constant is 4. If initially 1 mol of A and 1 mol of B are added in 1 L container, then the equilibrium concentration of A is

(1) 0.5 M (2) 1 M

(3) 2 M (4) 4 M

61. 500 mL of each of 0.1 M CH_3COOH and 0.05 M NaOH are mixed together, the pH of the resulting mixture is (pK_a (CH_3COOH) = 4.7)

(1) 4.7 (2) 9.3

(3) 11.7 (4) 2.3

62. Lewis acid among the following is

(1) H_2SO_4 (2) H_2O

(3) BF_3 (4) PH_3

63. Which of the following salt does not show salt hydrolysis?

(1) NH_4Cl (2) CH_3COONa

(3) CH_3COONH_4 (4) NaCl

64. Unit of K_C for the equilibrium $4NH_3(g) + 5O_2(g) \rightleftharpoons 4NO(g) + 6H_2O(g)$ is

(1) mol L^{-1} (2) L mol^{-1}

(3) mol^5L^{-5} (4) L^5 mol^{-5}

65. The oxidation number of Cr in K_2CrO_4 is

(1) 2 (2) 5

(3) 6 (4) 7

66. For the redox reaction

$$Cr_2O_7^{2-} + C_2O_4^{2-} + H^+ \longrightarrow Cr^{3+} + CO_2 + H_2O$$

The correct coefficients of the reactant for the balanced equation are

	$Cr_2O_7^{2-}$	$C_2O_4^{2-}$	H^+
(1)	1	3	7
(2)	1	3	14
(3)	3	1	14
(4)	3	2	7

67. Which of the following species can show disproportionation reaction?

(1) HNO_3 (2) H_2CO_3

(3) HOCl (4) H_2SO_4

68. Average oxidation state of bromine in Br_3O_8 is

(1) +1 (2) 16/3

(3) 4/3 (4) 8/3

69. Given the standard electrode potentials $K^+/K = -2.93$ V, $Ag^+/Ag = 0.8$ V

$Hg^{2+}/Hg = 0.79$ V, $Cr^{3+}/Cr = -0.74$ V

Correct order of reducing power is

(1) Ag > Hg > Cr > K (2) K > Hg > Cr > Ag

(3) K > Cr > Hg > Ag (4) Ag > Cr > Hg > K

70. Which of the following is a self-indicator?

(1) Methyl orange

(2) Potassium permanganate

(3) Potassium dichromate

(4) Starch

71. Oxidation state of hydrogen is negative in

(1) H_2 (2) CaH_2

(3) NH_3 (4) H_2O_2

72. Which of the following is a redox reaction?

(1) $2Na + 2HCl \rightarrow 2NaCl + H_2$

(2) $Na_2O + 2HCl \rightarrow 2NaCl + H_2O$

(3) $NaOH + HCl \rightarrow NaCl + H_2O$

(4) $Na_2CO_3 + 2HCl \rightarrow 2NaCl + H_2O + CO_2$

73. Product formed at anode during the electrolysis of aqueous solution of $CuCl_2$ with platinum electrode is

(1) Cu (2) Cl_2

(3) O_2 (4) H_2

74. E°_{cell} of the Daniel cell is

(Given $E^\circ_{Zn^{2+}/Zn} = -0.76$ V, $E^\circ_{Cu^{2+}/Cu} = 0.34$ V)

(1) 0.42 V (2) –0.42 V

(3) 1.1 V (4) –1.1 V

75. Minimum oxidation state shown by nitrogen is in

(1) NH_3 (2) N_2

(3) N_3H (4) N_2O

76. The pH of 10^{-8} M HCl solution is

(1) 8 (2) 6

(3) 3 (4) 6.97

77. When Zn reacts with aqueous NaOH it gives
(1) ZnO and $H_2(g)$ (2) ZnO and H_2O
(3) Na_2ZnO_2 and $H_2(g)$ (4) Na_2ZnO_2 and $O_2(g)$

78. Catalyst used for the formation of methanol by using syngas is
(1) Cobalt (2) Nickel
(3) Pd – $BaSO_4$ (4) Sulphur – quinoline

79. Interstitial hydride among the following is
(1) CrH (2) NaH
(3) CH_4 (4) NH_3

80. Select the correct statement for water among the following.
(1) Bond angle in gas phase is 104.5°
(2) At atmospheric pressure, it crystallizes into cubic form
(3) It is non-polar molecule
(4) It contains sp^2 – *s* overlapped bond(s)

81. Which among the following method is used to remove only temporary hardness of water?
(1) Clark's method
(2) Ion-exchange method
(3) Synthetic resins method
(4) Washing soda method

82. The strength of 2.8 volume solution of hydrogen peroxide is
(1) 8.5 gL^{-1} (2) 0.85 gL^{-1}
(3) 1.7 gL^{-1} (4) 17 gL^{-1}

83. When SO_3 reacts with heavy water it produces
(1) SO_2 (2) H_2SO_4
(3) D_2SO_4 (4) D_2SO_3

84. Dihedral angles of H_2O_2 in gas phase and solid phase respectively are
(1) 111.5°, 90.2° (2) 111.5°, 111.5°
(3) 90.2°, 90.2° (4) 90.2°, 111.5°

85. Select the incorrect statement about hydrogen peroxide among the following.
(1) It is miscible with water in all proportions
(2) Its commercially marketed sample is 10 V
(3) In its pure state, it is of red colour
(4) Its boiling point is more than water

SECTION-B

86. Which among the following element has highest number of *s*-orbital electrons?
(1) Li (2) Na
(3) Be (4) K

87. Incorrect match of flame colour of alkali metals is
(1) Li : Crimson red
(2) K : Violet
(3) Rb : Red violet
(4) Cs : Yellow

88. Select the correct order of density of alkali metals,
(1) Li > Na > K > Rb (2) Li < Na < K < Rb
(3) Li < K < Na < Rb (4) Li < Na < Rb < K

89. Which among the following will be of yellow or orange colour?
(1) Na_2O_2 (2) Li_2O
(3) MgO (4) KO_2

90. Which among the following has least negative enthalpy of formation?
(1) LiF (2) NaF
(3) KF (4) CsF

91. Select the compound of highest melting point among the given options.
(1) RbF (2) RbCl
(3) RbBr (4) RbI

92. Which among the following hydroxide will be most soluble?
(1) $Be(OH)_2$ (2) $Mg(OH)_2$
(3) $Ca(OH)_2$ (4) $Ba(OH)_2$

93. Gases produced on thermal decomposition of $Ba(NO_3)_2$ are
(1) NO_2 and N_2O (2) NO_2 and O_2
(3) N_2O and O_2 (4) N_2O and O_3

94. Select the correct statement among the following.
(1) Crude sodium chloride contains calcium chloride as one of the impurities
(2) Solubility of sodium chloride significantly increases with increase in temperature
(3) Calcium chloride is less soluble than sodium chloride in water
(4) Sodium chloride boils at 1081 K

95. Which among the following compound has highest covalent character?
(1) $BeCl_2$ (2) $MgCl_2$
(3) $CaCl_2$ (4) $SrCl_2$

96. Incorrect match of name of compound is
(1) $CaSO_4 \cdot ½\ H_2O$: Plaster of Paris
(2) $CaCl_2 \cdot Ca(OCl)_2$: Bleaching powder
(3) $Ca_3Al_2O_6$: Tricalcium aluminate
(4) Ca_2SiO_4 : Gypsum

97. For a good quality of cement, ratio of CaO to the total of the oxides (i.e., SiO_2, Al_2O_3 and Fe_2O_3) is closed to
(1) 2.5 : 4 (2) 4 : 2.5
(3) 1 : 3 (4) 2 : 1

98. Maximum solubility of AgCl is in
(1) Pure water
(2) 0.1 M NaCl
(3) 0.1 M $CaCl_2$
(4) 0.1 M $AgNO_3$

99. If K_a of a weak acid is 10^{-10} then pK_b of its conjugate base at 25°C will be
(1) 10 (2) 10^{-4}
(3) 4 (4) 10^{-3}

100. Al_4C_3 on reaction with D_2O gives
(1) CD_4 (2) $Al(OH)_3$
(3) CH_4 (4) AlD_3

BOTANY

SECTION-A

101. Classification for flowering plants given by George Bentham and Joseph Dalton Hooker
(1) Is also known as artificial system of classification
(2) Was mainly based on the androecium structure
(3) Considers embryology, ultrastructure, phytochemistry
(4) Used only gross superficial morphological characters

102. Fusion of non-flagellated and similar sized gametes occurs in
(1) *Chlamydomonas* (2) *Volvox*
(3) *Fucus* (4) *Spirogyra*

103. Select the **incorrect** match.
(1) Agar – *Gracilaria*
(2) Carrageen – Brown algae
(3) Food Supplement by space travellers – *Spirulina*
(4) Peat – *Sphagnum*

104. Which stored food in algae is very similar to amylopectin and glycogen in structure?
(1) Pyrenoids (2) Mannitol
(3) Floridean starch (4) Starch

105. Flagella in zoospores of brown algae are
(1) Two, unequal and laterally attached
(2) Two, equal and apically attached
(3) Two, unequal and apically attached
(4) Two, equal and laterally attached

106. Sexual reproduction is accompanied by complex post fertilisation development in
(1) *Ulothrix* (2) *Dictyota*
(3) *Fucus* (4) *Polysiphonia*

107. Select the **incorrect** statement w.r.t. bryophytes.
(1) Attach to the substratum by unicellular or multicellular rhizoids
(2) They possess stem-like and leaf-like structures
(3) The sporophyte is free-living and photosynthetic
(4) Zygote does not undergo reduction division immediately

108. Gemmae are
(1) Green, unicellular, sexual buds
(2) Green, multicellular, asexual buds
(3) Non-green, unicellular, asexual buds
(4) Non-green, multicellular, sexual buds

109. First stage of gametophyte in mosses is
(1) Leafy stage
(2) Upright, slender axis bearing spirally arranged leaves
(3) Creeping, green, branched and frequently filamentous stage
(4) The stage which bears sex organs

110. Spores in pteridophytes germinate to give rise to
(1) Inconspicuous, multicellular, free-living prothallus
(2) Conspicuous, multicellular, mostly non-photosynthetic gametophytes
(3) Large, multicellular, free-living, photosynthetic sporophyte
(4) Small, unicellular, photosynthetic prothallus

111. Select the **odd** one out w.r.t. heterospores.
(1) *Selaginella* (2) *Salvinia*
(3) *Cedrus* (4) *Adiantum*

112. Specialised roots called coralloid roots that are associated with N_2–fixing cyanobacteria are found in
(1) *Pinus* (2) *Cycas*
(3) *Pteris* (4) *Sequoia*

113. Select the **correct** match w.r.t. post fertilisation events.
(1) Zygote – Embryo
(2) Ovule – Fruit
(3) PEN – Degenerates
(4) Ovaries – Seeds

114. Select the **incorrect** statement w.r.t. embryo sac in angiosperms.
(1) Embryo-sac formation is preceded by meiosis
(2) It has a three-celled egg apparatus
(3) Each of the cells of an embryo-sac is diploid
(4) It has two polar nuclei

115. Which of the following plants shows haplo-diplontic life cycle?
(1) *Ectocarpus* (2) *Wolffia*
(3) *Fucus* (4) *Volvox*

116. Which among the following plant shows event that is a precursor to the seed habit?
(1) Bryophytes (2) Gymnosperms
(3) Pteridophytes (4) Angiosperms

117. Axillary bud
(1) Can form a flower or a branch
(2) Is a secondary meristem
(3) Is formed by intercalary meristem
(4) Consists of non-dividing cells

118. Secondary meristem out of these is
(1) Root apical meristem
(2) Intercalary meristem
(3) Interfascicular meristem
(4) Intrafascicular meristem

119. Collenchyma differs from parenchyma as
(1) Former has secondary cell wall of pectin
(2) Later is living
(3) Later is dead mechanical tissue
(4) Former can store food

120. Seed coats of legumes are rich in
(1) Sclereids
(2) Collenchyma
(3) Parenchyma
(4) Sclerenchyma fibres

121. A vessel
(a) Is single celled tube like structure
(b) Is devoid of protoplast
(c) Is similar to a sieve tube as both have perforated end walls

Choose the **incorrect** one(s).
(1) a and c (2) b and c
(3) a only (4) c only

122. Phloem parenchyma
(1) Is only living component of phloem
(2) Is absent in most of the monocots
(3) Lacks pits
(4) Synthesises food material but does not store it

123. Root hairs and trichomes show similarity in being
(1) Epidermal structures
(2) Multicellular
(3) Soft or stiff
(4) Branched structures

124. The only living component of xylem is
(1) Tracheid (2) Vessel
(3) Ray parenchyma (4) Xylem fibres

125. Choose the option that **correctly** differentiates between protoxylem and metaxylem.

	Protoxylem	Metaxylem
(1)	Type of primary xylem	Type of secondary xylem
(2)	First formed xylem	Appear in later stage of plants life
(3)	Always found towards pith in plants	Always found towards periphery in plants
(4)	It is living tissue	It is dead tissue

126. In place of companion cells, gymnosperms have
(1) Sieve cells (2) Subsidiary cells
(3) Albuminous cells (4) Complimentary cells

127. Casparian strips
(a) Are found on endodermis
(b) Are made of impermeable waxy material
(c) May be seen in roots and stems
(d) Allow passage of water molecules through them
Choose the **correct** one.
(1) a and b (2) b, c and d
(3) a, b and c (4) b and c

128. Pericycle forms semi lunar patches of sclerenchyma cells in
(1) Dicot roots
(2) Monocot stems
(3) Dicot stems
(4) Monocot roots

129. During secondary growth in stem, after continued activity of vascular cambium
(1) Primary xylem remains more or less intact
(2) Secondary xylem and phloem gets crushed
(3) More phloem is formed as compare to xylem
(4) Both (1) and (2)

130. Select the structure **not** found in isobilateral leaf.
(1) Bulliform cells
(2) Palisade mesophyll
(3) Conjoint vascular bundle
(4) Stoma on upper surface

131. Spring wood can be differentiated from autumn wood as it
(1) Has narrow vessels than autumn wood
(2) Is lighter in colour than autumn wood
(3) Has higher density than autumn wood
(4) Is formed by activity of cork cambium

132. Bark does **not** include
(1) Phellogen (2) Secondary cortex
(3) Secondary phloem (4) Secondary xylem

133. Lens shaped openings found in most woody trees are
(1) Called stomata
(2) Involved in gaseous exchange in monocot plants
(3) Formed by activity of phellogen
(4) Surrounded by subsidiary cells

134. Heartwood and sapwood both are
(1) Types of secondary xylem
(2) Involved in conduction of water from root to leaf
(3) Involved in storage of tannins and resins
(4) Composed of lignified living cells

135. In dicot roots
(1) Xylem is endarch type
(2) Vascular cambium is secondary in origin
(3) Protoxylem is situated in centre
(4) Pith is large and well developed

SECTION-B

136. Stele lacks
(1) Pith (2) Pericycle
(3) Xylem (4) Endodermis

137. Identify filamentous algae among these.
(1) *Chlamydomonas* (2) *Volvox*
(3) *Porphyra* (4) *Ectocarpus*

138. In which of the given plants archegonia is seen inside ovule?
(1) *Cycas* (2) Pea
(3) *Salvinia* (4) *Pteris*

139. Find out the **wrongly** matched pair among these.
(1) *Lycopodium* – Antheridia and archegonia on separate gametophytes
(2) *Cedrus* – Stem is branched
(3) *Equisetum* – Produces flagellated male gametes
(4) Conifers – Have needle like leaves

140. Mark the **incorrect** statement.
(1) Mosses have an elaborate mechanism of spore dispersal
(2) Protonema is juvenile stage of liverworts
(3) *Funaria* has multicellular and branched rhizoids
(4) Leafy stage of *Sphagnum* develops from secondary protonema

141. Which of the given is **not** seen in sporophyte of *Equisetum*?
(1) Strobilus (2) Node
(3) Rhizome (4) Floral bud

142. In which of the following plants both gametes are non-motile?
(1) *Spirogyra*
(2) *Volvox*
(3) *Fucus*
(4) *Ulothrix*

143. In which of the given plants, cell wall is composed of cellulose and pectose?
(1) *Chara* (2) *Fucus*
(3) *Dictyota* (4) *Laminaria*

144. Sporophyte is dominant plant body of
(1) *Sphagnum* (2) *Marchantia*
(3) *Laminaria* (4) *Psilotum*

145. Male and female gametophytes do not have independent existence in
(1) Gymnosperms
(2) Mosses
(3) Ferns
(4) Liverworts

146. Select the **correct** statement for exarch condition of xylem.
(1) It is arrangement of secondary xylem
(2) It is seen in stem
(3) Protoxylem is situated towards periphery
(4) First formed primary xylem is situated towards pith in roots in exarch condition.

147. Identify the dead component of phloem among these.
(1) Sieve tube
(2) Companion cell
(3) Phloem parenchyma
(4) Bast fibre

148. Lateral roots are formed by
(1) Endodermis (2) Epidermis
(3) Pericycle (4) Cortex

149. Water containing cavities are seen inside vascular bundles of
(1) Dicot root
(2) Monocot stem
(3) Dicot stem
(4) Monocot root

150. In dicot root, a part of vascular cambium arises from
(1) Cortex (2) Medullary rays
(3) Pericycle (4) Endodermis

ZOOLOGY

SECTION-A

151. Brain is a vital organ of our body and needs to be well protected. Arrange the meninges in the order where the layer in contact with the brain comes first towards the layer in contact with the cranium.

The meninges are

Arachnoid (A), Pia mater (B), Dura mater (C)

(1) $A \rightarrow B \rightarrow C$ (2) $C \rightarrow B \rightarrow A$

(3) $B \rightarrow A \rightarrow C$ (4) $B \rightarrow C \rightarrow A$

152. In a genetic condition where the coloured part of one eye and the other eye are different, which part of the eye shows this type of difference?

(1) Iris (2) Cornea

(3) Pupil (4) Retina

153. The outermost layer of the eye, sclera belongs to the same category of tissue as that of

(1) Bone (2) Cartilage

(3) Adipose tissue (4) Dermis of skin

154. The left and the right cerebral hemispheres have different sizes. Even if that's the case, both the hemispheres communicate with each other. This communication is possible because of which of the following structure?

(1) Corpus callosum

(2) Thalamus

(3) Hypothalamus

(4) Corpora quadrigemina

155. If a bee was dissected, what would be an apt description of its nervous system?

(1) No nervous system

(2) Network of neurons were present like *Hydra*

(3) Brain along with a number of ganglia and neural tissues

(4) Brain absent, only ganglia and spinal cord present

156. The type of muscle fibres that regulates the diameter of the pupil are

(1) Smooth, voluntary

(2) Striated, voluntary

(3) Non-striated, involuntary

(4) Skeletal, involuntary

157. Select the odd one w.r.t. unconditional reflex action.

(1) Knee jerk

(2) Shielding eyes when suddenly exposed to bright light

(3) Voluntarily pressing the brake without any object in front of the car

(4) Withdrawing arm on touching something hot

158. From the parts mentioned in the box, which ones are not a part of the forebrain?

Cerebrum, Thalamus, Hypothalamus, Corpora quadrigemina

(1) One (2) Two

(3) Three (4) Four

159. Gustatory receptors and olfactory receptors are sensory receptors. They help to detect the changes in environment and send appropriate signals to the CNS.

Which factors in the environment are detected by gustatory and olfactory receptors?

(1) Temperature

(2) Chemicals

(3) Pressure

(4) Light

160. Read the given descriptions and recognize the part of the human neural system associated with it.

i. Has an outer part called cortex

ii. Makes up the 'command and control system'

iii. Site for processing speech, vision, etc. are present

Choose the **correct** option.

(1) Spinal cord

(2) ANS

(3) Brain

(4) Brain stem

161. Match the column I with column II and select the correct option.

	Column I		Column II
a.	Neuron with a cell body and one axon	(i)	Innermost layer of the eye
b.	Neuron with one axon and one dendrite	(ii)	Embryonic stage
c.	Neuron with one axon and two or more dendrites	(iii)	Cortex of the largest part of the brain

(1) a(i), b(ii), c(iii) (2) a(iii), b(ii), c(i)

(3) a(i), b(iii), c(ii) (4) a(ii), b(i), c(iii)

162. What is the neural organisation in the phylum having the most specialised cells called stinging cells?

(1) Only a network of neurons

(2) Network of neurons and a brain

(3) A brain along with a number of ganglia

(4) CNS and PNS

163. Select the incorrect statement.

(1) Schwann cells envelope myelinated nerve fibres.

(2) Unmyelinated nerve fibres do not have a myelin sheath around the axon.

(3) Nodes of Ranvier are seen on unmyelinated nerve fibres.

(4) Schwann cells form a myelin sheath around the axon.

164. Structures like A , B etc. form a complicated structure which is involved in the regulation of sexual behaviour, expression of emotional reactions, etc

Select the option that correctly fill the blanks A and B respectively.

	A	B
(1)	Corpora quadrigemina	Medulla oblongata
(2)	Medulla oblongata	Cerebellum
(3)	Cerebrum	Pons
(4)	Amygdala	Hippocampus

165. Read the following statements carefully.

Statement A : All neurotransmitters are hormones.

Statement B : Some hormones function as neurotransmitters.

Statement C : All neurotransmitters and hormones are produced by endocrine glands.

Choose the option which correctly describes the given statements.

(1) All statements are incorrect

(2) Only statements B and C are incorrect

(3) Only statements A and C are incorrect

(4) Only statements A and B are incorrect

166. **Assertion (A) :** Increased muscular activity of heart leads to tachycardia.

Reason (R) : The supply of oxygen to muscles increases as the energy demand decreases during strenous exercise.

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 for (A)

(2) Both (A) and (R) are true but (R) is not the correct explanation for (A)

(3) (A) is true but (R) is false

(4) (A) is false but (R) is true

167. Read the following statements about electrical synapses.

a. They are rare in our body.

b. Transmission of impulses by chemical synapses are always faster than that by electrical synapses.

c. Impulse conduction along a single axon is very similar to transmission of impulse across electrical synapse.

Select the option with correct statements.

(1) a and b

(2) b and c

(3) a and c

(4) a, b and c

168. How many of the following are not a part of the brain stem?

Pons, Cerebrum, Cerebellum, Thalamus, Medulla oblongata

(1) One (2) Two

(3) Three (4) Four

169. Our body follows a 24 hour rhythm. Gaurav is habituated to have his lunch around noon everyday.

The hunger that he feels every day around noon is controlled by

(1) Pons (2) Cerebellum

(3) Cerebrum (4) Hypothalamus

170. Locomotion and capture of prey in *Hydra* occurs with the help of

(1) Cilia (2) Flagella

(3) Tentacles (4) Pseudopodia

171. In humans, which of the given cells show amoeboid movement?

(1) Goblet cells (2) Macrophages

(3) Spermatozoa (4) Fibroblasts

172. Select the odd one w.r.t. cranial bones.

(1) Temporal (2) Occipital

(3) Zygomatic (4) Parietal

173. All of the following events occur during muscle contraction except

(1) Sliding of thin filaments over thick filaments

(2) Increased Ca^{2+} levels in the sarcoplasm

(3) Reduction in length of A-band

(4) Shortening of the sarcomere

174. Evaluate the statements given below w.r.t. structure of skeletal muscles

A. Each muscle fibre contains number of muscle bundles held together by a common collagenous connective tissue layer called fascia.

B. Muscle fibre is a syncytium.

C. In the center of each I band, an inelastic fibre *i.e.*, 'Z' line is present

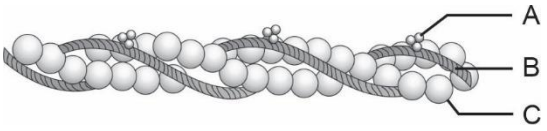
D. The thick filaments in 'A' band are held together in the middle by a thin fibrous 'M' line

Select the option which constitutes correct statements only.

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

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

175. Identify the figure given below and match the labelled parts as A, B and C with their respective description.



Column A		Column B
A	(i)	Polymer of globular actin
B	(ii)	Masks the active binding sites for myosin
C	(iii)	Runs close to F-actin throughout the length

Choose the **correct** option

(1) A(ii), B(i), C(iii)

(2) A(i), B(ii), C(iii)

(3) A(iii), B(ii), C(i)

(4) A(ii), B(iii), C(i)

176. A motor unit is formed by

(1) A mixed neuron along with the muscle fibres

(2) A motor neuron along with the muscle fibres connected to it

(3) A sensory neuron along with the muscle fibres connected to it

(4) A sensory neuron, motor neuron and muscle fibres connected to it

177. Consider the given features regarding red muscle fibres.

(A) Amount of sarcoplasmic reticulum is high

(B) Large number of mitochondria

(C) Depend upon anaerobic process for energy

(D) Contract for a longer period without fatigue.

Select the option that include only incorrect features.

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

(3) C and D (4) C only

178. The part of adenohypophysis 'A' secretes only one hormone called 'B'. B regulates the pigmentation of the skin. Identify 'A' and 'B'.

	A	B
(1)	Pars nervosa	TSH
(2)	Pars distalis	MSH
(3)	Pars intermedia	MSH
(4)	Pars distalis	FSH

179. Group of hormones which interact with intracellular receptors include hormones that stimulate/regulate the

(1) Release of follicle stimulating hormone and luteinizing hormone

(2) Glycogenesis in the target cell

(3) Synthesis and secretion of glucocorticoids

(4) Development and maturation of male accessory sex organs

180. Which of the following are functions of endocrine gland that is located on either side of trachea?

a. Regulation of basal metabolic rate

b. Maintenance of water and electrolyte balance

c. Influences pigmentation

d. Erythropoiesis

e. Development and maturation of the CNS

f. Regulate menstrual cycle

Choose the correct option.

(1) a, b, d, e and f (2) a, b and d only

(3) a, c, d and e (4) a, b, c and d

181. Hormones are also secreted by some tissues which are not endocrine glands. Such hormones are called

(1) Neurogenic hormones

(2) Catecholamines

(3) Growth factors

(4) Androgens

182. Deficiency of iodine in a woman's diet during pregnancy may results in baby having the following features except

(1) Low intelligence quotient

(2) Deaf – mutism

(3) Protrusion of eyeballs

(4) Abnormal skin

183. Identify the trophic hormones and select the **correct** option.

a. TSH

b. ACTH

c. LH

d. FSH

e. MSH

(1) a, b, c and d

(2) a, b and d only

(3) a, b and c only

(4) a, b, c, d and e

184. The endocrine system provides chemical integration through hormones. Choose the correct option w.r.t. it.

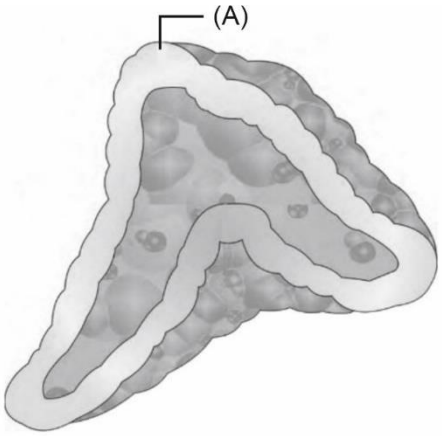
(1) It provides rapid coordination among organs as compared to neural system

(2) Endocrine system is in direct connection with target organ under control

(3) Invertebrates have no chemical coordination

(4) Chemical coordination is long lived

185. The functions of hormones produced by 'A' does not include



(1) Increase glomerular filtration rate

(2) Play a role in growth of axial and pubic hair during puberty

(3) Increase body fluid volume

(4) Raising of hairs

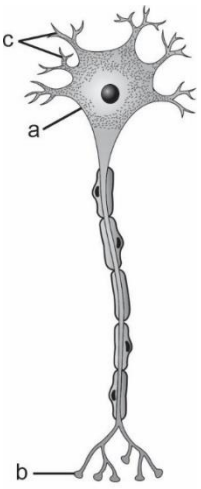
SECTION-B

186. The neurosecretory cells in the hypothalamus are responsible for the _____ function.

Choose the option that correctly fills the blank.

(1) Exocrine (2) Endocrine

(3) Protective (4) Insulation

187. 

In the diagram given above certain structures are named as a, b and c.

When this cell carries an impulse, the correct pathway of conduction of impulse can be represented by which of the options given below?

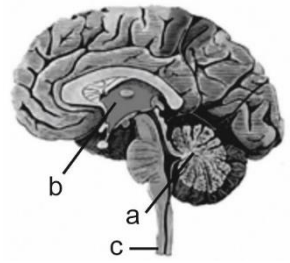
(1) $a \rightarrow c \rightarrow b$ (2) $b \rightarrow a \rightarrow c$

(3) $c \rightarrow a \rightarrow b$ (4) $b \rightarrow c \rightarrow a$

188. When a neuron is not conducting any impulse in its resting condition, the axonal membrane is comparatively more permeable to

(1) Na^+ (2) K^+

(3) Cl^- (4) Ca^{2+}

189. 

Choose the **incorrect** statement from the following.

(1) 'c' is part of the CNS

(2) 'a' looks like a smaller version of cerebrum.

(3) 'b' is a major coordinating centre

(4) 'a' is a part of the midbrain

190. Select the set of bones from the options given below which are not the part of axial skeleton.

(1) Sphenoid and ethmoid bone

(2) Coxal and patella bone

(3) Sacrum and coccyx

(4) Maxilla and mandible

191. Read the statements given below carefully w.r.t vertebral column in human beings and select the correct option.

(1) Neural canal passes through the spinal cord.

(2) Number of cervical vertebrae is 7 in all the members of class Mammalia including human beings.

(3) The vertebral column is the point of attachment for the ribs and musculature of the back.

(4) The vertebral column is a series of 26 vertebrae placed dorso-laterally.

192. Find the incorrect match.

(1) Between atlas and axis – Pivot joint

(2) Between carpal and metacarpal of thumb side – Saddle joint

(3) Between the carpals – Hinge joint

(4) Between femur and pelvic girdle – Ball and socket joint

193. A 7 year old boy is suffering from an auto immune disorder affecting neuromuscular junction leading to fatigue, weakness and paralysis of skeletal muscles.

Select the correct answer for the given diagnosis.

(1) Tetany

(2) Muscular dystrophy

(3) Myasthenia gravis

(4) Arthritis

194. What is the point of attachment of costal cartilage of vertebrochondral ribs?

(1) Sternum (2) 7^{th} rib

(3) Vertebral column (4) Not attached

195. Which of the following is not a paired bone?

(1) Patella (2) Hyoid

(3) Parietal (4) Scapula

196. Choose the odd one w.r.t. the source gland.

(1) ADH (2) Oxytocin

(3) GH (4) Somatostatin

197. Which of the following is not true for a complex disorder called diabetes mellitus?

(1) Loss of glucose through urine

(2) Increase in proteins of the body

(3) Formation of more ketone bodies

(4) Treated with insulin therapy

198. The most unique mammalian characteristic is the presence of milk producing glands by which young ones are nourished. Hormones responsible for development of this gland and formation of milk in them includes all of the following except

(1) Prolactin (2) Estrogen

(3) Oxytocin (4) Progesterone

199. Releasing hormones from hypothalamus reach adenohypophysis through

(1) Neuron

(2) Neurosecretory cells

(3) Portal circulation

(4) Diffusion

200. Which hormone stimulates the synthesis and secretion of steroid hormones from the adrenal cortex?

(1) ACTH (2) TSH

(3) PTH (4) GnRH

❑ ❑ ❑

NBTS

Corporate Office : Aakash Tower, 8, Pusa Road, New Delhi-110005, Phone : 011-47623456

MM : 720 **Time : 3.00 Hrs**

NCERT Booster Test Series

(*for* NEET-2022)

Test – 5

Answer key

1. (1)	41. (4)	81. (1)	121. (3)	161. (4)
2. (3)	42. (2)	82. (1)	122. (2)	162. (1)
3. (3)	43. (1)	83. (3)	123. (1)	163. (3)
4. (4)	44. (3)	84. (1)	124. (3)	164. (4)
5. (3)	45. (1)	85. (3)	125. (2)	165. (3)
6. (1)	46. (3)	86. (4)	126. (3)	166. (3)
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