02-04-2019

Code - B

Aakash

Medical | IIT-JEE | Foundations

(Divisions of Aakash Educational Services Limited)

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MM : 720

Test Series for NEET - 2019
Test - 4

Time : 3 Hrs.

Topics Covered :

Physics : Properties of Bulk Matter, Thermal Properties of Matter, Thermodynamics, Behaviour of Perfect Gas and Kinetic theory.

Chemistry : Redox Reaction, Hydrogen, s-Block Elements (Alkali and Alkaline earth metals), Some p-block elements (Group 13 & 14).

Botany : Mineral Nutrition; Photosynthesis in Plants.

Zoology : Body fluids and Circulation, Excretory products and their Elimination; Locomotion and Movement.

Instructions :

(i) Use Blue/Black ballpoint pen only to darken the appropriate circle.

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

(iii) Dark only one circle for each entry.

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

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

(vi) Each question carries 4 marks. For every wrong response 1 mark shall be deducted from total score.

PHYSICS

Choose the correct answer :

1. The bulk modulus of rubber is 9.8×10^8 N/m^2. To what depth should a rubber ball be taken in a lake, so its volume is decreased by 0.1%? ($\rho_w = 1000$ kg/m^3) ($g = 9.8$ m/s^2)

   (1) 25 m (2) 100 m

   (3) 200 m (4) 500 m

2. A metalic rod of length L and cross-sectional area A is made of material of young's modulus Y. If the rod is elongated by an amount ℓ, then the work done in elongation is proportional to

   (1) ℓ (2) $\frac{1}{\ell}$

   (3) ℓ^2 (4) $\frac{1}{\ell^2}$

3. By inserting a capillary tube upto depth ℓ in water, the water rises to a height h. If the lower end of the capillary tube is closed inside water and capillary is taken out and closed end opened. The length of water remain in the tube is (Here $\ell > h$)

   (1) Zero (2) $\ell + h$

   (3) $2h$ (4) h

4. A body floats in water with 40% of its volume outside water. When same body floats in an oil, 60% of its volume remains outside the oil. The relative density of oil is

   (1) 0.9

   (2) 1.0

   (3) 1.2

   (4) 1.5

5. A solid sphere falls with a teminal velocity of 10 cm/sec in the earth's gravitational field. If it is released from rest in a gravity free space then terminal velocity will be

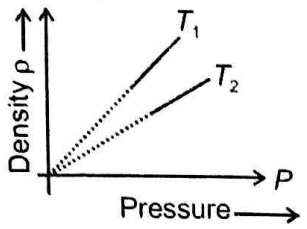
   (1) Equal to 10 cm/sec

   (2) More than 10 cm/sec

   (3) Equal to 20 cm/sec

   (4) Zero

6. The density (ρ) versus pressure (P) graphs of a given mass of an ideal gas is shown in figure at two different temperatures T_1 and T_2. The relation between T_1 and T_2 may be



(1) $T_1 > T_2$ (2) $T_1 < T_2$

(3) $T_1 = T_2$

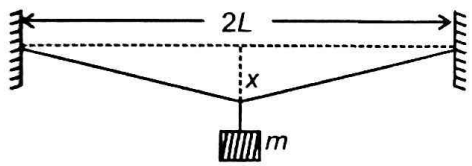
(4) Both (1) and (2) are correct

7. An insulated box containing a diatomic gas of molar mass M is moving with speed v. The box is suddenly stopped. The resulting change in temperature is

(1) $\frac{Mv^2}{5R}$ (2) $\frac{Mv^2}{3R}$

(3) $\frac{Mv^2}{R}$ (4) $\frac{2Mv^2}{5R}$

8. A steel wire of length $2L$ and cross-sectional area A is stretched, within elastic limit, horizontally between two supports as shown in figure. When a mass m is suspended from the mid-point of the wire, mid-point of wire is lowered by $x(x << L)$. Longitudinal strain in the wire is



(1) $\frac{x}{L}$ (2) $\frac{x^2}{2L^2}$

(3) $\frac{x^2}{L^2}$ (4) $\frac{x}{2L}$

9. Which of the following is correct for streamline flow?

(1) The velocity of a fluid particle remains constant

(2) The speed of a fluid particle remains constant

(3) The velocity of all fluid particles crossing a given position is constant

(4) The velocity of all fluid particles crossing a given position is constant

10 A 20 cm long capillary tube is dipped in water. The water rises upto 8 cm. If the entire arrangement is put in a freely falling elevator the length of water column in the capillary tube will be

(1) 8 cm (2) 10 cm

(3) 4 cm (4) 20 cm

11. A hole is made at the bottom of a tank filled with water. If total pressure at the bottom of the tank is three atmosphere, then the velocity of efflux at the bottom is (1 atm = 10^5 N/m^2)

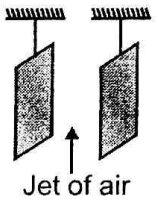
(1) 20 m/s

(2) $10\sqrt{2}$ m/s

(3) $10\sqrt{6}$ m/s

(4) $10\sqrt{5}$ m/s

12. Two thin aluminium sheets are suspended as shown in figure. A jet of air is blown into the space between them, what will happen?



(1) The sheets will come closer to each other

(2) The sheets will move apart

(3) There will be no effect

(4) The sheets will be raised up

13. A spherical body with radius 12 cm radiates 450 W power at 500 K. If the radius were halved and the temperature doubled the new power radiated will be

(1) 900 W (2) 1200 W

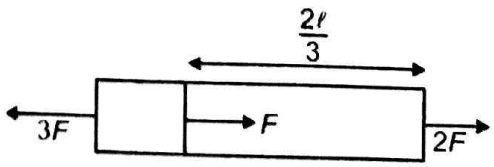
(3) 1800 W (4) 2700 W

14. An open vessel containing water is given a constant horizontal acceleration a. Due to accelerated motion the free surface of water makes angle θ with veritcal which is given by

(1) $\theta = \tan^{-1}\left[\frac{a}{g}\right]$ (2) $\theta = \tan^{-1}\left[\frac{g}{a}\right]$

(3) $\theta = \sin^{-1}\left[\frac{a}{g}\right]$ (4) $\theta = \cos^{-1}\left[\frac{g}{a}\right]$

15. A uniform cylindrical rod of length ℓ, cross-sectional area A and Young's modulus Y is acted upon by the forces as shown in figure. The elongation of the rod is



(1) $\frac{2}{5}\frac{F\ell}{AY}$ (2) $\frac{3}{5}\frac{F\ell}{AY}$

(3) $\frac{3}{8}\frac{F\ell}{AY}$ (4) $\frac{7F\ell}{3AY}$

16. A vessel of area of cross-section A is filled with water and kerosene oil. The vessel has a small hole of area a ($a << A$) the bottom. Neglecting viscosity if the height of water layer is h_1 and kerosene is h_2, then the velocity v of flow of water will be: (Given: Density of water is ρ_1 and that of kerosene is ρ_2) ($\rho_1 > \rho_2$)

(1) $v = \sqrt{2g(h_1 + h_2)}$

(2) $v = \sqrt{2g\left(h_1 + h_2\frac{\rho_2}{\rho_1}\right)}$

(3) $v = \sqrt{2g(h_1\rho_1 + h_2\rho_2)}$

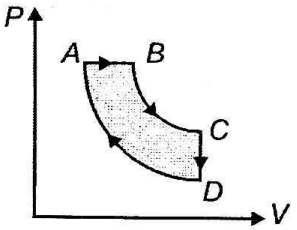
(4) $v = \sqrt{2g\left(\frac{h_1\rho_1}{\rho_2} + h_2\right)}$

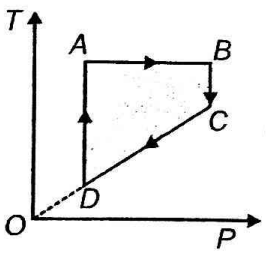
17. One end of horizontal thick wire of length $2L$ and radius $2R$ is connected to one end of another horizontal wire of length L and radius R of same material. If equal forces are applied across two ends then ratio of elongation in the two wires is

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

(3) $\frac{1}{3}$ (4) $\frac{1}{5}$

18. A cyclic process $ABCD$ is shown in the P-V diagram. Which of the following curves represent the same process? (Process BC and DA are isothermal)



(1)


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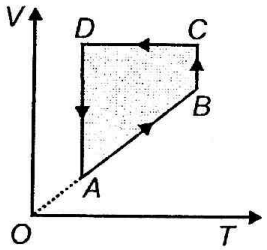

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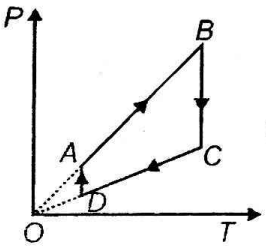

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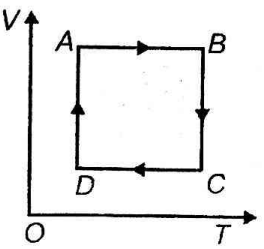
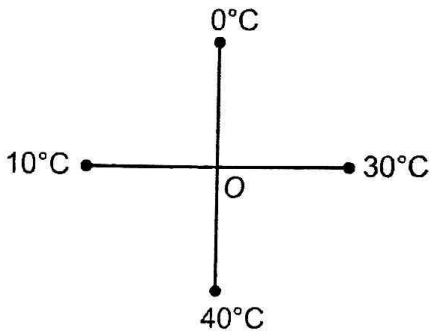


19. Four identical rods are arranged as shown in the figure. The temperature of the junction O in steady state is



(1) 25°C (2) 20°C

(3) 35°C (4) 40°C

20. A centigrade and a Fahrenheit thermometer are dipped in boiling water. Now the water temperature is lowered untill Fahrenheit thermometer registers 140°. The fall in temperature registered by centigrade thermometer is

(1) 40°C (2) 30°C

(3) 72°C (4) 60°C

21. Two rods of lengths L_1 and L_2 are made of materials whose coefficients of linear expansion are α_1 and α_2. If the difference of length of two rods is independent of temperature then

(1) $\frac{L_1}{L_2} = \frac{\alpha_1}{\alpha_2}$ (2) $\frac{L_1}{L_2} = \frac{\alpha_2}{\alpha_1}$

(3) $\frac{L_1}{L_2} = \frac{\alpha_1^2}{\alpha_2^2}$ (4) $\frac{L_1^2}{L_2^2} = \frac{\alpha_2}{\alpha_1}$

22. If 20 g of water at 30°C is mixed with following given sample of water, then final temperature maximum in the case of

(1) 20 gm of water at 40°C

(2) 40 gm of water at 35°C

(3) 10 gm of water at 50°C

(4) 4 gm of water at 80°C

23. A wall has two layers A and B, made of different materials. The thickness of both the layers is same. The thermal conductivities of A and B are related as $K_A = 3\,K_B$. The temperature difference across the wall is 20°C. Then in steady state

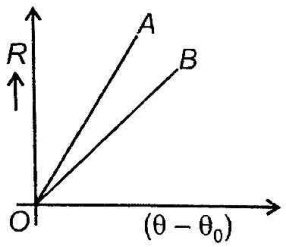
(1) The temperature difference across A is 15°C

(2) Rate of heat transfer across A is more than across B

(3) Rate of heat transfer across B is more than across A

(4) The temperature difference across A is 5°C

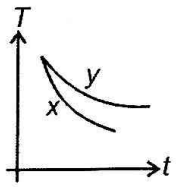
24. Two circular discs A and B having same mass with equal radii and emissivities heated to same temperature and are cooled under indentical conditions. The inference drawn from their colling curves is (R is rate of cooling, q_0 is surrounding temperature)



(1) A and B have same specific heats.
(2) Specific heat of A is less than B.
(3) Specific heat of B is less than A.
(4) Nothing can be said about specific heats

25. If an ideal gas expands according to the law PV^2 = constant. The temperature of the gas
(1) Remains the same
(2) Increases
(3) Decreases
(4) May increase or decrease

26. Two spherical bodies of same mass and surface area raised to a temperature T and allowed to cool in the same environment. The curve of temperature versus time is as shown in figure. Emissivity and absorptivity are e_x, e_y and A_x, A_y respectively. Then correct relation is



(1) $e_x > e_y$, $A_x > A_y$ (2) $e_x < e_y$, $A_x > A_y$
(3) $e_x > e_y$, $A_x < A_y$ (4) $e_x < e_y$, $A_x < A_y$

27. A body cools from 50°C to 40°C in 5 minutes. The surrounding temperature is 20°C. The time (in minutes) in which it cools from 40°C to 30°C is

(1) 5 (2) $\frac{15}{2}$

(3) $\frac{25}{3}$ (4) 10

28. Two carnot heat engines A operating between 700 K and 300 K and B between 800 K and 400 K respectively. If η_A and η_B are their efficiencies then relation in their efficiencies is

(1) $\eta_A = \eta_B$ (2) $\eta_A = \frac{2}{3}\eta_B$

(3) $\eta_A = \frac{8}{7}\eta_B$ (4) $\eta_A = \frac{4}{3}\eta_B$

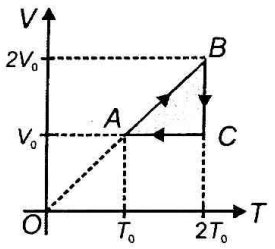
29. One mole of an ideal gas undergoes a process, $P = \frac{P_0}{1+\left[\frac{V_0}{V}\right]^2}$, here P_0 and V_0 are constants. Change in temperature of the gas when volume is changed from $V = V_0$ to $V = 2V_0$ is

(1) $\frac{-2P_0V_0}{5R}$ (2) $\frac{11P_0V_0}{10R}$

(3) $\frac{-5P_0V_0}{4R}$ (4) P_0V_0

30. An ideal monatomic gas is supplied 80 joule heat at constant pressure. The increase in internal energy of gas, is
(1) 58 J (2) 48 J
(3) 44 J (4) 32 J

31. An ideal monatomic gas undergoes a cyclic process $ABCA$ as shown in the figure. The ratio of heat absorbed during AB to the work done on the gas during BC is



(1) $\frac{5}{2\ln 2}$ (2) $\frac{5}{3}$

(3) $\frac{5}{4\ln 2}$ (4) $\frac{5}{6}$

32. An ideal monatomic gas undergoes a process which follows the relation $P \propto V$. The molar heat capacity of the gas is

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

(3) $2R$ (4) $\frac{5}{3}R$

33. n moles of an ideal gas undergoes a process in which the temperature changes with volume as $T = KV^2$. The work done by the gas as the temperature changes from T_0 to $4T_0$ is

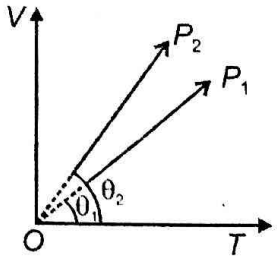
(1) $3nRT_0$ (2) $\frac{5}{2}nRT_0$

(3) $\frac{3}{2}nRT_0$ (4) Zero

34. A refrigerator, whose coefficient of performance is 4, extracts heat from the water inside it at the rate of 200 J/cycle. The amount of the heat released in the room per cycle is

(1) 250 J (2) 400 J
(3) 680 J (4) 180 J

35. In the given (V-T) diagram for a fixed mass of an ideal gas, the relation between pressure P_1 and P_2 is



(1) $P_2 > P_1$

(2) $P_2 < P_1$

(3) $P_2 = P_1$

(4) Can not be predicted

36. H_2 gas kept in vessel at 27°C is heated so that root mean square speed of its molecules increases by 41.4%. The final temperature of the gas is

(1) 54°C (2) 127°C

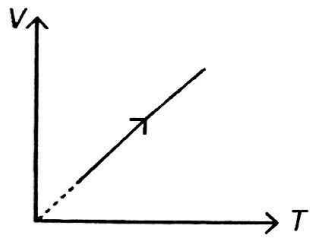
(3) 227°C (4) 327°C

37. An ideal gas is expanding such that PT^2= constant. The coefficient of volume expansion of the gas is

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

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

38. A monatomic ideal gas undergoes a thermodynamic process as shown in the figure. The molar specific heat of the process is



(1) $\frac{3}{2}R$ (2) $\frac{5}{2}R$

(3) $\frac{7}{5}R$ (4) $2R$

39. The relation between internal energy U, pressure P and volume V of a gas in an adiabatic process is $U = a + bPV$ where a and b are positive constants. The value of ratio of molar specific heats (γ) is

(1) $\frac{a}{b}$ (2) $\frac{b+1}{b}$

(3) $\frac{a+1}{a}$ (4) $\frac{b}{a}$

40. One mole of an ideal gas at initial temperature of T K does $6R$ Joule of work adiabatically. The ratio of specific heats C_p and C_v is 5/3. The final temperature of the gas is

(1) $(T + 2.4)$ K (2) $(T - 2.4)$ K

(3) $(T + 4)$ K (4) $(T - 4)$ K

41. In which of the following gas, vibrational mode is excited at room temperature?

(1) Hydrogen (2) Nitrogen

(3) Oxygen (4) Chlorine

42. Steam at 100°C is passed into 54 g of water at 30°C, till the temperature of mixture becomes 90°C. If the latent heat of steam is 536 cal/g, the mass of mixture is (approximately)

(1) 80 g (2) 60 g

(3) 74 g (4) 64 g

43. A wooden block of mass 8 kg is tied to a string attached to the bottom of a tank. The block is completely inside the water. The tension in string is (Relative density of wood is 0.8 and g = 10 m/s^2)

(1) 100 N (2) 80 N

(3) 50 N (4) 20 N

44. A liquid of density ρ comes out with a velocity v from a horizontal tube of area of cross-section A. The reaction force exerted by the liquid on the tube is

(1) $F \propto v^2$

(2) $F \propto v$

(3) $F \propto A^2$

(4) $F \propto \rho^2$

45. A bucket having area of cross-section A, has a small hole of area 'a' at bottom, is placed under a tap of water. The rate of flow of water from tap is V m^3/s. The maximum height upto which water can be filled in bucket is

(1) $\frac{V^2}{2a^2g}$

(2) $\frac{V}{2ag}$

(3) $\frac{V^2}{a^2g}$

(4) $\frac{V^2}{ag}$

CHEMISTRY

46. Which one of the following element shows multiple oxidation states in its compounds?
(1) Sodium (2) Oxygen
(3) Fluorine (4) Aluminium

47. Values of x, y and z respectively for the balanced redox reaction are
$P_4(s) + x\,OH^-(aq) + yH_2O(l) \rightarrow zPH_3 + 3H_2PO_2^-$
(1) 3, 3, 1 (2) 3, 3, 3
(3) 1, 3, 3 (4) 3, 1, 3

48. Various oxidation number of carbon in C_3O_2 are
(1) 2, 1 (2) 2, 0
(3) 0, 1 (4) 4, 0

49. Which change requires a reducing agent?
(1) $Zn \rightarrow Zn^{2+}$ (2) $NO_3^- \rightarrow NO_2^-$
(3) $Cl^- \rightarrow ClO^-$ (4) $Br_2 \rightarrow Br^+$

50. The oxide which cannot act as a reducing agent is
(1) CO (2) SO_3
(3) Cr_2O_3 (4) NO_2

51. Oxidation states of N in N_3H, NH_2OH and N_2H_4 respectively are
(1) – 1/3, – 1, – 2 (2) – 1, – 3, + 2
(3) – 1/3, + 1, + 2 (4) – 1, + 3, – 2

52. (a) $H_2O_2 + O_3 \rightarrow H_2O + 2O_2$
(b) $PbS + H_2O_2 \rightarrow PbSO_4 + H_2O$
Role of hydrogen peroxide in the above reactions is respectively
(1) Oxidising in (a) and reducing in (b)
(2) Reducing in (a) and oxidising in (b)
(3) Reducing in (a) and (b)
(4) Oxidising in (a) and (b)

53. Which of the following has been arranged in order of decreasing oxidation number of sulphur?
(1) $H_2S_2O_7 > SCl_4 > S_8 > H_2S$
(2) $SO_3 > SO_4^{2-} > SO_3^{2-} > HSO_4^{\ominus}$
(3) $S^{2-} > S_8 > SF_6 > SCl_4$
(4) $H_2SO_4 > SO_2 > H_2S > H_2S_2O_8$

54. An alkali metal 'X' is considered as the strongest reducing agent. Halide of X is deliquescent and crystallises as a hydrate. The total number of water of crystallisation associated with this halide is
(1) 1 (2) 2
(3) 3 (4) 8

55. Which of the following reactions is/are used to prepare diborane?
(1) $BF_3 + NaBH_4 \xrightarrow{\text{heat}}$
(2) $B_2O_3 + H_2 + Al \xrightarrow[150^\circ C]{750\ atm}$
(3) $BF_3 + NaH \xrightarrow{180^\circ C}$
(4) All of these

56. The hybridisation of beryllium chloride in solid state is
(1) sp^2 (2) sp
(3) sp^3 (4) dsp^2

57. Unstable isotopes of hydrogen atom is
(1) ${}_1H^1$ (2) ${}_1H^2$
(3) ${}_1H^3$ (4) All are equally stable

58. Which of the given compound is obtained by Solvay's process?
(1) Sodium sulphate
(2) Potassium carbonate
(3) Sodium carbonate
(4) Calcium sulphate

59. B_2H_6 reacts with $(CH_3)_3N$ to produce
(1) $(CH_3)_3N.BH_3$ (2) $B_2H_2(CH_3)_4$
(3) $(NH_3)_2BH_4^{\oplus}\,\overset{\ominus}{B}H_4$ (4) $B(CH_3)_3$

60. The product obtained by hydroformylation of propene is
(1) $CH_2 = CH - CHO$
(2) $CH_3 - (CH_2)_2 - CHO$
(3) $CH_3 - (CH_2)_2 - CH_2OH$
(4) $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_2 - CH_3$

61. Which of the following is arranged in order of decreasing solubility in water?
(1) $BaSO_4 > SrSO_4 > CaSO_4 > MgSO_4 > BeSO_4$
(2) $BeSO_4 > CaSO_4 > MgSO_4 > SrSO_4 > BaSO_4$
(3) $BeSO_4 > MgSO_4 > CaSO_4 > SrSO_4 > BaSO_4$
(4) $CaSO_4 > BaSO_4 > BeSO_4 > MgSO_4 > SrSO_4$

62. Sodium nitrate upon thermal decomposition gives
(1) Na_2O_2
(2) $NaNO_2$
(3) NaN_3
(4) Na

63. The shapes of the molecules $(CH_3)_3N$ and $(SiH_3)_3N$ are
(1) Planar triangular and pyramidal respectively
(2) Pyramidal and planar triangular respectively
(3) Both pyramidal
(4) Both planar triangular

64. Which of the following statements is incorrect about silicones?
(1) They are chemically inert
(2) They are water repelling in nature
(3) They are thermally stable
(4) They are good conductors of electricity

65. Among the following, the most ionic compound is
(1) BeH_2 (2) CaH_2
(3) SrH_2 (4) BaH_2

66. Ionic mobility of which of the following alkali metal ions is highest when aqueous solution of their salts are put under an electric field?
(1) Cs (2) Na
(3) Rb (4) Li

67. Which of the following cannot form stable superoxide?
(1) Na (2) K
(3) Rb (4) Cs

68. In context with lithium, which one of the following statement is incorrect?
(1) It reacts directly with nitrogen of air.
(2) LiCl crystallises as a hydrate.
(3) Lithium hydrogen carbonate is obtained in solid form
(4) Its nitrate when heated gives its oxide.

69. Which of the following reaction is not included in solvay process?
(1) $2\ NH_3 + H_2O + CO_2 \rightarrow (NH_4)_2CO_3$
(2) $(NH_4)_2CO_3 + H_2O + CO_2 \rightarrow 2NH_4HCO_3$
(3) $NH_4HCO_3 + HCl \rightarrow NH_4Cl + H_2O + CO_2$
(4) $2NaHCO_3 \rightarrow Na_2CO_3 + CO_2 + H_2O$

70. Among alkaline earth metal, the minimum density is of
(1) Be (2) Mg
(3) Ca (4) Ba

71. Thermally least stable carbonate among the following is
(1) $BeCO_3$ (2) $MgCO_3$
(3) $CaCO_3$ (4) $BaCO_3$

72. The magnitude of enthalpy of formation of alkali-metal halides decreases in the order
(1) Fluoride > chloride > bromide > iodide
(2) Iodide > bromide > chloride > fluoride
(3) Bromide > iodide > fluoride > chloride
(4) Fluoride > chloride > iodide > bromide

73. Incorrect statement among the following is
(1) Reaction of NH_3 with diborane gives initially $[BH_2(NH_3)_2]^+[BH_4]^-$.
(2) $B_3N_3H_6$ is known as inorganic benzene.
(3) B_2H_6 contains four 2 centre 2 electron bonds and it is a non-planar molecule.
(4) Orthoboric acid is a diprotic acid.

74. $A + Na_2CO_3 \longrightarrow B + C$
$\xrightarrow[CO_2]{}$ Milky cloud, C
The chemical formula of A, B and C are
(1) $Ca(OH)_2$ (aq), NaOH, $CaCO_3$
(2) NaOH, $Ca(OH)_2$ (aq), $CaCO_3$
(3) NaOH, CaO, $CaCO_3$
(4) CaO, $Ca(OH)_2$ (aq), NaOH

75. Out of the following, choose an element which does not show catenation?
(1) C
(2) Si
(3) Pb
(4) Ge

76. Ge(II) compounds are powerful reducing agents whereas Pb (IV) compounds are strong oxidants. It is due to
(1) Pb is more electronegative than Ge
(2) Ionisation potential of Pb is less than that of Ge
(3) Ionic radii of Pb^{2+} and Pb^{4+} are larger than those of Ge^{2+} and Ge^{4+}
(4) More pronounced inert pair effect in lead than in Ge

77. Change in hybridization is observed in the given reaction for
$BF_3 + NH_3 \longrightarrow F_3B.NH_3$
(1) Boron from sp^2 to sp^3
(2) Nitrogen from sp^3 to sp^3d
(3) Boron from sp^3 to sp^2
(4) Both (1) & (2)

78. Select the correct statement in the following.
(1) Water containing some NaOH is hard water.
(2) Temporary hardness is due to soluble sulphates, chlorides and nitrates of Ca and Mg.
(3) Permanent hardness can remove by boiling of water.
(4) Hardness of water is expressed as ppm

79. The least reactive form of hydrogen is
(1) Molecular hydrogen
(2) Nascent hydrogen
(3) Atomic hydrogen
(4) All are equally reactive

80. The amount of H_2O_2 present in one litre of H_2O_2 solution having volume strength 100 V is
(1) 30.3 g (2) 303.6 g
(3) 22.4 g (4) 224 g

81. Which of the following hydride is a very powerful reducing agent?
(1) NaH (2) MgH_2
(3) AlH_3 (4) $NiH_{0.6}$

82. Which of the following has maximum ionic potential?
(1) Li^+ (2) K^+
(3) Rb^+ (4) Cs^+

83. Which of the given oxides is amphoteric in nature?
(1) SiO_2 (2) GeO_2
(3) PbO (4) GeO

84. In borax, number of bridging oxygen between two boron is
(1) 2 (2) 4
(3) 5 (4) 6

85. Buckminsterfullerene contains
(1) 20 six membered and 20 five membered rings
(2) 20 six membered and 12 five membered rings
(3) 12 six membered and 20 five membered rings
(4) 12 six membered and 12 five membered rings

86. Which of the following is a pyrosilicate?
(1) Na_4SiO_4 (2) $Be_3Al_2Si_6O_{18}$
(3) $Ca_3Si_2O_7$ (4) $Ca_3Si_3O_9$

87. The major component of Portland cement is
(1) CaO (2) SiO_2
(3) Al_2O_3 (4) MgO

88. Which of the following group element can form hydride?
(1) 6 (2) 7
(3) 8 (4) 9

89. Salt which does not contribute in hardness of water is
(1) $CaCl_2$ (2) $CaCO_3$
(3) $Ca(HCO_3)_2$ (4) $CaSO_4$

90. H_2O has high_____ than D_2O
(1) Melting point
(2) Viscosity
(3) Dielectric constant
(4) Enthalpy of vaporisation

BOTANY

91. Which of the following is **not** a significance of hydroponics?
(1) It can regulate the pH at optimum for a particular crop.
(2) Useful in areas having thin, infertile and dry soil.
(3) It increases the possibility of algal contamination and reaction of roots to sunlight.
(4) Employed as a technique for commercial production of seedless cucumber, lettuce etc

92 Plants growing near the nuclear test sites take up radioactive _____ from soil
Select the most appropriate option to fill the blank.
(1) Gold
(2) Selenium
(3) Strontium
(4) Iron

93. An essential element which is required in larger amount in comparison to other micronutrients and activates catalase is also
(1) Essential for formation of chlorophyll pigment.
(2) Required for synthesis of auxin.
(3) Causes accumulation of anthocyanin
(4) Responsible to overcome the apical dominance.

94. Deficiency symptoms of all of the given minerals tend to appear first in the older tissues, **except**

(1) N (2) P

(3) K (4) Ca

95. Select the microorganism from the following which is **not** capable of N_2 - fixation but is involved in nitrogen metabolism.

(1) *Nitrosomonas* (2) *Anabaena*

(3) *Rhizobium* (4) *Azotobacter*

96. During biological N_2 fixation division and growth of which root cells lead to formation of root nodules

(1) Epidermal cells only

(2) Cortical and pith cells

(3) Endodermal and pith cells

(4) Cortical and pericycle cells

97. Root nodules of some legumes contain red or pink coloured pigment called leghaemoglobin. This pigment

(1) Catalyses reduction of nitrogen into ammonia

(2) Protects nitrogenase from molecular oxygen

(3) Is a Mo–Fe protein

(4) Functions only in anaerobic condition inside the cytoplasm of bacteria.

98. Which of the following is **not** a criteria for essentiality of an element?

(1) Elements should be absolutely necessary for supporting normal vegetative growth only

(2) They should be directly involved in metabolism

(3) They should produce deficiency symptoms if present below the critical concentration

(4) The requirement of element should be specific and non-replaceable.

99. How many elements given in the box build the plant body and different protoplasmic constituents and do **not** become toxic in slight excess?

Fe, S, Mn, Cl, Zn, P, Cu, Mg, B, Ca

(1) 5 (2) 4

(3) 6 (4) 3

100. If there is prominent toxicity of micronutrient Mn in plants, there will be

(1) Appearance of brown spots surrounded by chlorotic veins

(2) Increased absorption of Ca^{2+} from soil

(3) Increase in binding of Mg with enzymes

(4) Inhibition of nitrogen uptake and its translocation to shoot apex

101. **Statement A:** Nitrogen is a limiting nutrient for both natural and agricultural ecosystem.

Statement B: Amides are involved in storage of excess nitrogen and its transport.

(1) Only statement A is incorrect

(2) Only statement B is incorrect

(3) Both statements A & B are incorrect

(4) Both statements A & B are correct

102. Choose **incorrect** statement regarding the absorption of minerals by plants.

(1) Initial phase of ions uptake is rapid

(2) In metabolic phase, the ions pass into symplast of cell without using ATP

(3) In the initial phase, the ions are absorbed passively

(4) The rate of minerals absorption is usually independent of their concentration in the soil

103. How many H^+ and ATP molecules are required for the synthesis of 6 molecules of NH_3 during fixation of atmospheric nitrogen?

	H^+	ATP
(1)	21	45
(2)	24	48
(3)	27	51
(4)	16	42

104. The nodules of soyabean export the fixed nitrogen in the form of

(1) Glutamine (2) Asparagine

(3) Ureides (4) Glutamic acid

105. Mark the **odd** one w.r.t. plants with diurnal acid cycle.

(1) Pineapple (2) Opuntia

(3) *Sorghum* (4) *Kalanchoe*

106. Glutamic acid is key amino acid formed in plants mainly by the process of

(1) Nitrogen fixation

(2) Reductive amination

(3) Nitrate assimilation

(4) Transamination

107. For biosynthesis of chlorophyll, raw material required are _____.

(1) Acetyl CoA and glutamine

(2) Oxaloacetic acid and tryptophan

(3) α-ketoglutaric acid and auxin

(4) Succinyl CoA and glycine

108. Who provided evidence for production of glucose in the green parts of plants during photosynthesis?
(1) Ruben and Kamen
(2) B. van Niel
(3) J. V. Sachs
(4) T. W. Engelmann

109. The experiment performed by Jan Ingenhousz concludes that
(1) Plant restores air whatever breathing animals and burning candles remove
(2) Sunlight is essential for the plant process that helps to somehow purify the air fouled by burning candles
(3) Glucose is produced when plants grow and glucose is usually stored as starch
(4) Oxygen evolved by the green plants comes from H_2O, not from carbon dioxide

110. Select the **incorrectly** matched pair.
(1) PS-I – P_{700} as reaction centre
(2) PS-II – P_{680} as reaction centre
(3) Non-cyclic photophos-phorylation – Occurs in both stroma lamellae and grana thylakoids
(4) Cyclic photophos phorylation – Occurs mostly in stroma lamellae

111. In chemiosmosis,
(1) Protons are accumulated in stroma by the splitting of water
(2) H^+ carrier molecule removes a proton from lumen to stroma while transporting an electron.
(3) Breakdown of proton gradient provides energy to cause a conformation change in only F_0 part of ATPase
(4) Proton gradient is broken down due to the movement of protons to stroma through transmembrane channel of ATPase.

112. All of the following are favourable conditions for non-cyclic phosphorylation to operate, **except**
(1) Optimum light
(2) Availability of light wavelengths beyond 680 nm only
(3) Presence of CO_2
(4) Aerobic conditions

113. Which of the following is/are **not** product(s) of Z-scheme of photosynthesis?
(a) ATP (b) NADPH
(c) CO_2 (d) O_2
(1) Only (c) (2) Only (a)
(3) Both (b) and (d) (4) (a), (b) and (d)

114. NADP reductase enzyme is located
(1) Inside the lumen
(2) On stroma side of thylakoid membrane
(3) On outer side of the inner membrane of chloroplast
(4) On lumen side of thylakoid membrane

115. Primary CO_2 acceptor molecule in wheat plant is a
(1) 5 - carbon aldehyde sugar
(2) 3 - carbon ketose sugar
(3) 5 - carbon ketose sugar
(4) 3 - carbon aldehyde sugar

116. For fixation of one CO_2 molecule, how many extra ATP are required in sugarcane in comparison to tomato plant?
(1) Five (2) Four
(3) Two (4) Three

117. Primary CO_2 fixation, in C_4 plants occurs in
(1) Cytoplasm of bundle sheath cell
(2) Chloroplast of bundle sheath cell
(3) Chloroplast of mesophyll cells
(4) Cytoplasm of mesophyll cells

118. In non-cyclic photophosphorylation, the last electron acceptor is
(1) H_2O (2) ADP
(3) $NADP^+$ (4) FAD^+

119. Which of the following is common between cyclic and non-cyclic photophosphorylation?
(1) Synthesis of ATP
(2) Photolysis of water to release O_2
(3) Reduction of $NADP^+$
(4) Accumulation of protons in stroma

120. Choose the **correct** match.

	Elements		**Activator of**
(1)	Mg	–	PEPcase
(2)	Zn	–	Urease
(3)	Mo	–	Catalase
(4)	Fe	–	Nitrate reductase

121. CAM plants differ from C_4 plants in

(1) Possessing dimorphic chloroplasts

(2) Lacking Kranz anatomy

(3) Having double carboxylation steps

(4) Formation of OAA as first stable product

122. Best defined function of manganese is

(1) Maintenance of turgidity of cell

(2) Formation of chlorophyll

(3) Regulation of cell differentiation

(4) Splitting of water to liberate oxygen during photosynthesis

123. In photorespiration, use of O_2 and evolution of CO_2 occurs respectively in

(1) Chloroplast, mitochondria

(2) Chloroplast, peroxisome

(3) Peroxisome, chloroplast

(4) Mitochondria, peroxisome

124. How many carbon atoms are present in

(a) Primary CO_2 acceptor in C_3 plant?

(b) Primary CO_2 fixation product in C_4 plant?

	(a)	(b)
(1)	4	5
(2)	3	5
(3)	3	4
(4)	5	4

125. C_4 plants are able to tolerate saline conditions because of

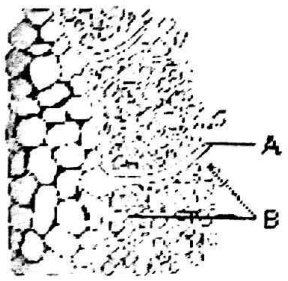
(1) Spatial separation of two CO_2 fixation steps

(2) Presence of organic acids in them

(3) Presence of granal chloroplasts in mesophyll cells

(4) Presence of low temperature sensitive enzyme PEP synthetase

126. Identify A and B from the given diagram.



	A	B
(1)	Root cortex	Soil particles
(2)	Root hair	Bacteria
(3)	Trichome	Bacteria
(4)	Root hairs	Bacterioids

127. Choose **incorrect** statement w.r.t. temperature as a factor affecting photosynthesis.

(1) Dark reaction is temperature controlled

(2) Light reaction is affected by temperature at much lesser extent

(3) C_4 plants are insensitive to low temperature

(4) Optimum temperature for C_3 plants is lower than C_4 plants

128. Which of the following is **not** the requirement of chemiosmosis?

(1) Thylakoid membrane

(2) Proton pump

(3) More electron accumulation in stroma than in lumen

(4) Presence of $F_0 - F_1$ particles

129. Leaves of *Amaranthus* have

(1) Agranal chloroplast in all the cells

(2) Kranz anatomy

(3) Carboxylation catalysed by RuBisCO only

(4) Large number of chloroplasts in mesophyll cells than bundle sheath cells

130. "Photorespiration occurs usually when there is __A__ concentration of oxygen. Under such circumstances, RuBisCO functions as an __B__.

Select the option that **correctly** fills the blanks A and B.

	A	B
(1)	High	Carboxylase
(2)	Low	Carboxylase
(3)	High	Oxygenase
(4)	Low	Oxygenase

131. Which of the following statements is **incorrect** w.r.t. Calvin cycle?

(1) It is the biosynthetic phase of photosynthesis.

(2) It occurs in all photosynthetic plants.

(3) In this cycle, the enzyme for CO_2 fixation shows much greater affinity for CO_2 than for O_2.

(4) Carboxylation of 3-PGA occurs in this cycle.

132. Identify the **incorrect** statement.

(1) Light duration does not affect the rate of photosynthesis, but it affects the overall photosynthesis.

(2) Maximum photosynthesis takes place in red and blue light of the visible spectrum.

(3) Light rarely becomes a limiting factor except for plants in shades or in dense forests.

(4) There is linear relationship between incident light and rate of photosynthesis at higher light intensities.

133. At low light intensities,

(1) Only C_3 plants respond to high CO_2 concentration for synthesis of glucose

(2) Only C_4 plants respond to high CO_2 concentration for CO_2 fixation

(3) Both C_3 and C_4 plants respond to high CO_2 concentration for photosynthesis

(4) Neither C_3 nor C_4 plants respond to high CO_2 concentration for CO_2 fixation

134. All of the given processes occur in response to water stress in leaves, **except**

(1) Increase in surface area

(2) Wilting

(3) Closure of stomata

(4) Reduced metabolic activity

135. The experiment which demonstrates the importance of CO_2 for photosynthesis is

(1) Bell jar experiment of Priestley

(2) Engelmann's experiment

(3) Half leaf experiment of Moll

(4) Cornelius Van Niel's experiment

ZOOLOGY

136. A person with blood group A^- can possibly donate blood, to a patient with blood group_____.

Select the **correct** option.

(1) Only A^- and O^+ (2) A^+, A^-, AB^- and AB^+

(3) B^+, O^-, B^- and O^+ (4) Only AB^+ and A^-

137. Histamine rich granulocytes circulating in blood involved in inflammatory reactions are

(1) Monocytes (2) Eosinophils

(3) Basophils (4) Neutrophils

138. Consumption of excessive amounts of coffee and beer can result in

(1) No impact on renal system

(2) Increased urinary output than normal

(3) Decreased production of nephric filtrate

(4) Failure of micturition reflex

139. Filtrate obtained in Proximal convoluted tubule is

(1) Hypertonic to blood plasma

(2) Isotonic to urine

(3) Hypotonic to blood plasma

(4) Isotonic to blood plasma

140. Which of the following is **not** a part of renal tubule?

(1) Loop of Henle

(2) Glomerulus

(3) PCT

(4) DCT

141. Select the event responsible for micturition in man.

(1) Contraction of external urethral sphincter

(2) Relaxation of involuntary sphincter

(3) Contraction of internal urethral sphincter

(4) Contraction of penile sphincters

142. Axial skeleton does **not** include the bone named

(1) Atlas

(2) Sphenoid

(3) Pubis

(4) Sternum

143. Arrange the events which occur during muscle contraction.

(a) Action potential causes the release of Ca^{2+} ions into the sarcoplasm.

(b) Activated myosin head binds to the exposed active sites on actin to form cross bridge.

(c) A neural signal at neuromuscular junction causes the release of ACh which generates action potential.

(d) Increase in Ca^{2+} levels leads to the binding of calcium with T_pC on actin filaments thereby unmasking active sites of actin.

Choose the correct option.

(1) a → c → b → d (2) a → c → d → b

(3) c → a → d → b (4) c → d → a → b

144. Which one of the following cardiac disorder is irreversible?
(1) Myocardial infarction
(2) Heart block
(3) Myocardial ischaemia
(4) Coronary vasoconstriction

145. Amoeboid movement is shown by all **except**
(1) Kupffer's cell
(2) Macrophages
(3) Human sperm
(4) *Entamoeba*

146. Which one of the following blood vessel carries blood from intestine to the liver before it is delivered to systemic circulation?
(1) Intestinal mesenteric capillaries
(2) Hepatic portal vein
(3) Hepatic vein
(4) Jugular vein

147. In which of the following organisms are/is its excretory structure(s) are **not** correctly matched?

Organisms		**Excretory structure**
(1) *Amphioxus*	-	Protonephridia with solenocyte
(2) Human	-	Kidney, liver
(3) Earthworm	-	Malpighian tubules
(4) Prawn	-	Antennary gland or green gland

148. Identify the conducting part of cardiac musculature that passes through the interventricular septum?
(1) Bundle of His
(2) Purkinje fibres
(3) Chordae tendineae
(4) Sinoauricular node

149. If a person passes very dilute urine but his blood glucose level is normal and he also drinks more water, then this condition may be due to
(1) Decrease in insulin secretion from pancreas
(2) More secretion of glucagon
(3) Reduced formation of vasopressin by posterior pituitary
(4) Decreased vasopressin production from hypothalamus

150. Identify the ball and socket joint among the following.
(1) Knee joint
(2) Joint at the wrist
(3) Joint between radius and ulna just below the elbow
(4) Hip joint

151. Select the absolute period between the closure of atrioventricular valve and semilunar valve.
(1) 0.1 s
(2) 0.5 s
(3) 0.4 s
(4) 0.3 s

152. In order to initiate skeletal muscle contraction, Ca^{2+} ions bind to which one of the following?
(1) Tropomyosin
(2) Troponin
(3) Hensen's zone
(4) Myosin head

153. Tubular reabsorption of water is minimum in
(1) Descending segment of Henle's loop
(2) Distal convoluted tubule
(3) Collecting duct
(4) Ascending segment of Henle's loop

154. Select the **incorrect** match.

Muscles	**Features**
(1) Biceps femoris	– Contains white muscle fibres where accumulation of lactic acid due to anaerobic breakdown of glycogen causes fatigue
(2) Detrusor muscles	– Have calmodulin that binds to Ca^{++} ions during muscle contraction
(3) Extensor muscles	– Myoglobin content is high, contain plenty of mitochondria, can utilise the large amount of oxygen stored in them for ATP production
(4) Eyeball muscles	– Contain only aerobic muscle fibres that slowly contract

155. Select the **correct** statement.

(1) P wave represents repolarisation of atria.

(2) QRS complex represents return of ventricles to excited state.

(3) By counting QRS complexes, one can determine the breathing rate of a person.

(4) The end of T wave marks the end of ventricular systole.

156. Part of urinary system where the term 'urine' is **not** applicable to the fluid flowing through it is

(1) Collecting duct

(2) Ureters

(3) Loop of Henle

(4) Minor calyx

157. Formation of urea in liver helps in the removal of which metabolic wastes?

(1) CO_2 and NH_3

(2) Ornithine and urea

(3) Urea and uric acid

(4) CO_2 and H_2O

158. Multinucleated, striated and unbranched muscle fibres are found in

(1) Skeletal muscles

(2) Smooth muscles

(3) Visceral muscles

(4) Cardiac muscles

159. Cavity known as acetabulum is bound by

(1) Acromion process and pubis

(2) Ileum and scapula

(3) Ileum and ischium

(4) Pubis, ilium and ischium

160. Ureotelic organisms include all **except**

(1) Ostrich

(2) *Rana*

(3) *Homo sapiens*

(4) Sharks

161. Select the **mismatch** of the organism and its excretory structure.

(1) *Planaria* – flame cells

(2) Prawn – green glands

(3) *Amphioxus* – Protonephridia

(4) *Homo sapiens* – Metanephridia

162. Arrange the following cells in increasing order of their abundance in blood.

(a) Lymphocytes (b) Erythrocytes

(c) Eosinophils (d) Thrombocytes

(e) Neutrophils

(1) b, c, d, a, e (2) c, b, d, e, a

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

163. The tissue that is present at the articulating surface zone of true ribs and sternum generally, is known as

(1) Hyaline cartilage

(2) Calcified cartilage

(3) White fibrous cartilage

(4) Tendons

164. Choose the **correct** match w.r.t. hormone, its source and function.

	Hormone	Source	Functions
(1)	ADH	Adenohy-pophysis	Increases loss of water through urine
(2)	Aldost-erone	Adrenal cortex	Stimulates the reabsorption of Na^+ and water from DCT
(3)	ANF	SA node of heart	Causes vasodilation and increase in blood volume, blood pressure
(4)	Renin	Kidney	Converts angiotensinogen into angiotensin II

165. During relaxed state in a muscle fibre associated with skeleton, the central part of thick filaments, **not** overlapped by thin filaments is called

(1) A band (2) Sarcomere

(3) 'H' zone (4) Anisotropic zone

166. Select the **incorrect** match w.r.t. the disorders of the circulatory system.

(1) Heart failure - Heart stops beating

(2) Angina - A symptom of acute chest pain

(3) Atherosclerosis - Caused by deposits of fat, cholesterol and fibrous tissues, which makes the lumen of arteries narrower

(4) Heart attack - Heart muscles are suddenly damaged by inadequate blood supply

167. Number of bicephalic, vertebrochondral ribs in man is

(1) Seven pairs (2) Twelve

(3) Ten pairs (4) Six

168. Which of the following is **incorrect** w.r.t. animal, type of heart and type of circulation?

	Animal	Type of heart	Type of circulation
(1)	*Rohu*	2 chambered	Single circulation
(2)	*Rana*	3 chambered	Incomplete double circulation
(3)	Lizard	3 chambered	Incomplete single circulation
(4)	Human	4 chambered	Double circulation

169. The osmotic concentration of the glomerular filtrate is greatest at the U-shaped turn of the loop of Henle. Here the filtrate concentration is about____ $mOsmL^{-1}$.

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

(1) 200 (2) 600

(3) 800 (4) 1200

170. Excretory product of the largest digestive gland of the human body are

(1) CO_2 and H_2O vapours

(2) NaCl and lactic acid

(3) Lysozyme and ammonia

(4) Bilirubin and Biliverdin

171. Each organised skeletal muscle in our body is made up of a number of muscle bundles, all held together by a common collagenous connective tissue layer called

(1) Fascia (2) Sarcolemma

(3) Perimysium (4) Endomysium

172. A is the blood without formed elements and clotting factors, while B is blood without its formed elements.

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

A	B
(1) Lymph	Serum
(2) Serum	Plasma
(3) Sebum	Lymph
(4) Lymph	Plasma

173. A disorder of the excretory system is

(1) Thrombocytopenia

(2) Hematuria

(3) Hemoglobinemia

(4) Polycythemia

174. Red muscle fibres differ from white muscle fibres due to

(1) Presence of myofibrils

(2) Presence of large quantity of myoglobin

(3) Absence of mitochondria

(4) Presence of large amount of sarcoplasmic reticulum.

175. Prothrombin is converted to thrombin to attain hemostasis in the presence of

(1) Fibrin

(2) Fibrinogen

(3) Thrombokinase

(4) Sodium ions

176. Pulse pressure in healthy man is around

(1) 40 mm Hg

(2) 80 mm Hg

(3) 140 mm Hg

(4) 120 mm Hg

177. Select the **incorrect** statement w.r.t. lymphatic system.

(1) The largest lymphatic vessel the thoracic duct empties into left subclavian vein near the heart

(2) The heart actively pumps the lymph through the lymphatic vessels

(3) Lymph has nearly similar mineral distribution as that in plasma

(4) A series of one way valves along the lymphatic vessel ensures unidirectional flow of lymph

178. Net filtration pressure leading to the formation of urine in man is

(1) 40 mm Hg

(2) 30 mm Hg

(3) 20 mm Hg

(4) 10 mm Hg

179. While putting food in mouth, which of the following does **not** occur?

(1) Flexion of arm

(2) Contraction of biceps

(3) Relaxation of triceps

(4) Contraction of masseter

180. Select the **incorrect** match.

(1) Axial skeleton – 80 bones

(2) Face – 14 bones

(3) Ankle – 8 bones

(4) Innominate – 2 bones

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Code - B

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MM : 720

Test Series for NEET - 2019
Test - 4

Time : 3 Hrs

ANSWERS

1. (2)	37. (3)	73. (4)	109. (2)	145. (3)
2. (3)	38. (2)	74. (1)	110. (3)	146. (2)
3. (3)	39. (2)	75. (3)	111. (4)	147. (3)
4. (4)	40. (4)	76. (4)	112. (2)	148. (1)
5. (4)	41. (4)	77. (1)	113. (1)	149. (4)
6. (2)	42. (2)	78. (4)	114. (2)	150. (4)
7. (1)	43. (4)	79. (1)	115. (3)	151. (4)
8. (2)	44. (1)	80. (2)	116. (3)	152. (2)
9. (3)	45. (1)	81. (1)	117. (4)	153. (4)
10. (4)	46. (2)	82. (1)	118. (3)	154. (4)
11. (1)	47. (1)	83. (3)	119. (1)	155. (4)
12. (1)	48. (2)	84. (3)	120. (1)	156. (3)
13. (3)	49. (2)	85. (2)	121. (2)	157. (1)
14. (2)	50. (2)	86. (3)	122. (4)	158. (1)
15. (4)	51. (1)	87. (1)	123. (1)	159. (4)
16. (2)	52. (2)	88. (1)	124. (4)	160. (1)
17. (1)	53. (1)	89. (2)	125. (2)	161. (4)
18. (2)	54. (2)	90. (3)	126. (2)	162. (3)
19. (2)	55. (4)	91. (3)	127. (3)	163. (1)
20. (1)	56. (3)	92. (3)	128. (3)	164. (2)
21. (2)	57. (3)	93. (1)	129. (2)	165. (3)
22. (4)	58. (3)	94. (4)	130. (3)	166. (1)
23. (4)	59. (1)	95. (1)	131. (4)	167. (4)
24. (2)	60. (2)	96. (4)	132. (4)	168. (3)
25. (3)	61. (3)	97. (2)	133. (4)	169. (4)
26. (1)	62. (2)	98. (1)	134. (1)	170. (4)
27. (3)	63. (2)	99. (2)	135. (3)	171. (1)
28. (3)	64. (4)	100. (1)	136. (2)	172. (2)
29. (2)	65. (4)	101. (4)	137. (3)	173. (2)
30. (2)	66. (1)	102. (2)	138. (2)	174. (2)
31. (3)	67. (1)	103. (2)	139. (4)	175. (3)
32. (3)	68. (3)	104. (3)	140. (2)	176. (1)
33. (3)	69. (3)	105. (3)	141. (2)	177. (2)
34. (1)	70. (3)	106. (2)	142. (3)	178. (4)
35. (2)	71. (1)	107. (4)	143. (3)	179. (4)
36. (4)	72. (1)	108. (3)	144. (1)	180. (3)