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MM : 720

NEET 720-MOCK TEST SERIES for NEET-2022

Time : 3 Hrs.

MOCK TEST - 4

Complete Syllabus of NEET

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. Which of the following has dimensions of $[ML^{-1}T^{-1}]$?

   (1) Surface tension

   (2) Coefficient of viscosity

   (3) Bulk modulus

   (4) Angular momentum

2. The following pair of forces act on a particle at angle θ that can have any value. The resultant of which pair can't have a magnitude of 4 N?

   (1) 2 N and 3 N (2) 3 N and 3 N

   (3) 2 N and 6 N (4) 3 N and 8 N

3. A body moving in a straight line covers a distance of 14 m in 5^{th} second and 20 m in 8^{th} second. What is its acceleration assuming uniform?

   (1) 1 m s^{-2} (2) 2 m s^{-2}

   (3) 5 m s^{-2} (4) 3 m s^{-2}

4. A particle is moving along x-axis with an acceleration $a = 2x$, where a is in m s^{-2} and x in meter. If the particle starts from rest at $x = 1$ m, what is its velocity when it reaches position $x = 3$ m?

   (1) 2 m s^{-1} (2) 3 m s^{-1}

   (3) 4 m s^{-1} (4) 6 m s^{-1}

5. 5.74 g of a substance occupies 1.2 cm^3. What is its density by keeping significant figures in view?

   (1) 4.78 g cm^{-3}

   (2) 4.69 g cm^{-3}

   (3) 4.8 g cm^{-3}

   (4) 4.83 g cm^{-3}

6. If the distance travelled by body is directly proportional to time taken. Its speed

   (1) Increases

   (2) Decreases

   (3) Becomes zero

   (4) Remains constant

7. A staircase consists of 3 steps, each 10 cm high and 20 cm wide. What should be minimum horizontal velocity of a ball rolling off the uppermost step so as to hit directly lowest plane? (g = 10 m/s^2)

(1) 4 m/s (2) 2 m/s

(3) 6 m/s (4) 1.2 m/s

8. A ball is thrown in air with some initial speed at an angle to horizontal. It describes parabolic path. Which of the following has same value at the time of throw and time of return?

(1) Linear momentum

(2) Velocity

(3) Vertical component of velocity

(4) Horizontal component of velocity

9. A cyclist is riding with speed of 7.5 m s^{-1}. As he enters a circular turn on a road of radius 80 m, he applies brakes and reduces speed at a rate of 0.5 m/s every second. What is the magnitude of net acceleration of cyclist at this instant?

(1) 0.86 m s^{-2} (2) 0.38 m s^{-2}

(3) 0.7 m s^{-2} (4) 1.2 m s^{-2}

10. A body of mass 3 kg is under the influence of force $\vec{F} = 6t\hat{i} + 4t\hat{j}$ (N). Assuming body was at rest at t = 0, the velocity of body at t = 3 s is

(1) $6i + 4\hat{j}$ m/s (2) $18\hat{i} + 6\hat{j}$ m/s

(3) $9i + 6\hat{j}$ m/s (4) $18\hat{i} + 12\hat{j}$ m/s

11. Pulling is easier than pushing because

(1) When we pull a roller, the vertical component of pulling acts along weight

(2) When we pull a roller, vertical component of pulling acts opposite to weight direction

(3) Force of friction becomes along direction of motion

(4) Coefficient of friction decreases on pulling roller

12. Two skaters A and B approach each other at right angles. Skater A has mass of 30 kg and speed of 1 m/s and skater B has mass of 20 kg and speed of 2 m/s. They meet and cling together. Their final speed has magnitude of

(1) 1 m/s

(2) 2 m/s

(3) 1.5 m/s

(4) 2.1 m/s

13. A 30 kg block rests on rough horizontal surface. A horizontal force of 200 N is applied on the body. The block acquires a speed of 4 m/s, starting from rest, in 2 s. What is the value of coefficient of friction? (g = 10 m/s^2)

(1) $10\sqrt{3}$ (2) $\frac{\sqrt{3}}{10}$

(3) 0.19 (4) 0.47

14. A mass m is revolving in vertical circle at the end of string of length 20 cm in critical condition. By how much does the tension of the string at lowest position exceeds the tension at topmost point?

(1) 3 mg (2) 4 mg

(3) 5 mg (4) 6 mg

15. The kinetic energy of a body decreases by 19%. What is the percentage decrease in momentum?

(1) 20% (2) 15%

(3) 10% (4) 38%

16. In an inelastic collision

(1) Momentum is conserved but kinetic energy is not conserved

(2) Momentum is not conserved but energy is conserved

(3) Neither momentum nor energy is conserved

(4) Both the momentum and kinetic energy are conserved

17. A force $\vec{F} = 5\hat{i} + 3\hat{j} + 2\hat{k}$ N is applied over a particle which displaces it from origin to the point $\vec{r} = (2\hat{i} - \hat{j})$ m. The work done on particle in joules is

(1) 10 (2) 7

(3) –7 (4) 13

18. Three identical uniform rods, each of length l, are joined to form a rigid equilateral triangle. Its radius of gyration about an axis passing through a corner and perpendicular to plane is

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

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

19. Which of the following quantity does not depend on the orbital radius of the satellite? (T is time period and R is orbital radius)

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

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

20. Bulk modulus of perfectly rigid body is equal to

(1) Zero

(2) Infinity

(3) Non zero constant

(4) Some finite value

21. Two liquid drops coalesce to form a large drop, then

(1) Energy is liberated

(2) Energy is absorbed

(3) Some mass gets converted into energy

(4) Energy is neither liberated nor absorbed

22. In the displacement of oscillating particle, the equation is $x = 2\cos\left(0.5\pi t + \frac{\pi}{3}\right)$. What is the maximum speed of the particle? (x in meter, t in second)

(1) π m s^{-1} (2) 2π m s^{-1}

(3) 0.5 m s^{-1} (4) 1 m s^{-1}

23. For a certain organ pipe three successive resonance frequencies are observed at 425, 595 and 765 Hz respectively. What is the fundamental frequency?

(1) 42 Hz (2) 425 Hz

(3) 119 Hz (4) 85 Hz

24. A vessel of volume V and thermal coefficient of linear expansion α is completely filled with a liquid. The liquid does not overflow on heating. The thermal coefficient of volume expansion of liquid is

(1) $\frac{V-\alpha}{V}$ (2) $\frac{V}{V-\alpha}$

(3) 4α (4) 3α

25. Of the following, which one has highest specific heat?

(1) Water (2) Copper

(3) Ice (4) Aluminium

26. An electric dipole will experience a net force when it is placed in

(1) Uniform electric field

(2) Uniform magnetic field

(3) A non-uniform electric field

(4) Both (1) and (2)

27. An uncharged insulated spherical conductor A is brought near a positively charged insulated conductor B, then

(1) The charge and potential of B, both remains constant

(2) Both charge and potential of B changes

(3) Charge on B remains constant but potential increases

(4) Charge on B remains constant but potential decreases

28. An electric dipole is placed at an angle of 30º with an electric field of intensity 2×10^5 N/C. It experiences a torque of 4 N m. What is the charge on dipole if dipole length is 2 cm?

(1) 8 mC

(2) 4 mC

(3) 8 μC

(4) 2 mC

29. If the potential of capacitor having capacity 6 μF is increased from 10 V to 20 V , then increase in its energy will be

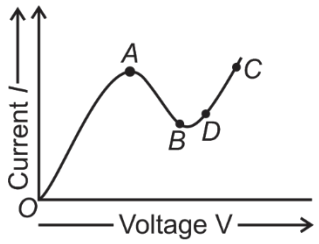
(1) 4×10^{-4} J

(2) 4×10^{-2} J

(3) 9×10^{-4} J

(4) 7×10^{-4} J

30. From the graph between current I and voltage V shown below, identify the portion corresponding to negative dynamic resistance.



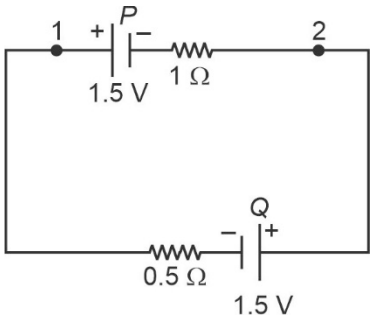
(1) OA

(2) AB

(3) BD

(4) CD

31. Two cells *P* and *Q* connected in series has each of emf of 1.5 V and internal resistance of 1 Ω and 0.5 Ω respectively. What is the magnitude of potential drop across between points marked 1 and 2?



(1) 0.75 V (2) 1.25 V

(3) 1.5 V (4) 0.5 V

32. If in the experiment of wheatstone bridge, the position of the cell and galvanometer are interchanged then balance condition will

(1) Change

(2) Remains unchanged

(3) Depend on internal resistance of cell

(4) Depend on resistance of galvanometer

33. A wire 28 m long is bent into *N* turns of nearly circular coil of diameter 14 cm forming a solenoid of length 60 cm. What is magnetic flux density inside when a current of 5 A passed through it?

(1) 6.67×10^{-4} T

(2) 3.59×10^{-3} T

(3) 2.67×10^{-4} T

(4) 6.2×10^{-4} T

34. An electron is moving with velocity of 10^6 m s^{-1} through uniform magnetic field of 0.1 T which is perpendicular to direction of the motion. What is the force on the electron?

(1) 1.6×10^{-12} N

(2) 1.6×10^{-14} N

(3) 5×10^{-9} N

(4) 3.2×10^{-14} N

35. A dip circle is taken to magnetic equator. The needle is allowed to move in magnetic meridian, the needle will stay

(1) In horizontal direction

(2) In vertical direction

(3) In any direction it is released

(4) In any direction except vertical or horizontal

SECTION-B

36. The mutual inductance of a pair of coils is 0.75 H. If current in primary coil changes from 0.5 A to zero in 0.01 s, the average emf induced in the secondary coil is

(1) 12.5 V (2) 2.5 V

(3) 5.75 V (4) 37.5 V

37. A 60 V – 10 W bulb is operated at 100 V – 60 Hz AC. The inductance required for same current is

(1) 0.64 H (2) 1.28 H

(3) 0.32 H (4) 2.56 H

38. An AC source is connected to a purely resistive circuit. Which one is true of the following?

(1) Current leads ahead of voltage in phase

(2) Current lags behind voltage in phase

(3) Current and voltages are in phase

(4) Any of these may be true depending on resistance value

39. In electromagnetic wave, the average energy density is associated to

(1) Electric field only

(2) Magnetic field only

(3) Equally with electric and magnetic field

(4) Average energy density is zero

40. In hydrogen atom an electron makes a transition from $n = 2$ to $n = 1$. The magnetic field produced by circulating electron at the nucleus

(1) Decreases 16 times

(2) Decreases 4 times

(3) Increases 32 times

(4) Increases 4 times

41. At any instant, the ratio of amount of radioactive substance is 2 : 1. If their half lives are respectively 12 and 16 hours, then after 2 days, what will be the ratio of amount of substance left?

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

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

42. In a common emitter transistor amplifier $\beta = 60$, output resistance $R_0 = 5000$ Ω and input resistance of transistor is 500 Ω. The voltage amplification of amplifier will be

(1) 560 (2) 460

(3) 300 (4) 600

43. For spherical mirrors, focal length of paraxial and marginal rays are f_P and f_m respectively. Then

(1) $f_P = f_m$ (2) $f_P < f_m$

(3) $f_P > f_m$ (4) $f_P \leq f_m$

44. A small telescope has objective of focal length 140 cm and an eye piece of focal length 5 cm. What is the maximum magnifying power of the telescope?

(1) 28 (2) 32

(3) 39.3 (4) 33.6

45. In Young's double slit experiment, the interference pattern is found to have an intensity ratio between bright and dark fringes as 9. What is ratio of amplitudes of interfering coherent waves?

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

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

46. The statement, polarity of induced emf is such that it tends to produce a current which opposes the change in magnetic flux that produces it, is known as

(1) Coulomb's law of magnetism

(2) Gauss's law of electrostatics

(3) Faraday's law

(4) Lenz's law

47. In an ideal transformer, the number of turns of primary and secondary coil is given as 100 and 400 respectively. If power input is 600 W, the power output will be

(1) 150 W (2) 2400 W

(3) 600 W (4) 400 W

48. A convex lens of refractive index 1.5 has focal length 10 cm in air. Now the lens is placed in liquid of refractive index 1.25, then its focal length will become

(1) 20 cm (2) 25 cm

(3) 15 cm (4) 5 cm

49. Match list-1 with list-2.

	List-1		List-2
A.	Franck Hertz experiment	P.	Particle nature of light
B.	Davisson-Germer experiment	Q.	Discrete energy levels of atom
C.	Photo electric experiment	R.	Wave nature of light
		S.	Wave nature of electron

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

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

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

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

50. A radioactive nucleus has specific binding energy E_1. It emits an alpha particle, the resulting nucleus has specific binding energy E_2, then

(1) $E_1 = E_2$

(2) $E_2 = 0$

(3) $E_2 > E_1$

(4) $E_2 < E_1$

CHEMISTRY

SECTION-A

51. Which among the following elements shows diagonal relationship with beryllium?

(1) Mg

(2) Si

(3) Al

(4) Na

52. Molality of urea in a aqueous solution is 2 m. Mole fraction of urea in the solution is

(1) 0.035 (2) 0.632

(3) 0.124 (4) 0.966

53. Number of oxygen atoms in 0.2 g molecules of $Na_2S_2O_3$ is

(1) 0.2

(2) 0.4

(3) 0.4 N_A

(4) 0.6 N_A

54. Kinetic energy of an electron in first Bohr's orbit of Li^{2+} ion is

(1) 17 eV (2) 13.6 eV

(3) 122.4 eV (4) 30.6 eV

55. Select the ion of largest size in gas phase among the given species
(1) Mg^{2+}
(2) O^{2-}
(3) Na^{+}
(4) N^{3-}

56. The negative electron gain enthalpy of which atom is highest?
(1) O
(2) Te
(3) S
(4) Se

57. If a particle of mass 500 mg is moving with a velocity of 100 m/s then the de-Broglie wavelength of the particle will be
$(h = 6.625 \times 10^{-34})$s
(1) 1.32×10^{-35} m
(2) 1.32×10^{-32} m
(3) 1.32×10^{-34} m
(4) 1.32×10^{-31} m

58. In the Haber's process of synthesis of ammonia, 28 g of N_2 is mixed with 10 g of hydrogen. Maximum number of moles of ammonia produced in the reaction is
(1) 1.5 (2) 3.5
(3) 2 (4) 0.5

59. Wave number of yellow radiation having wavelength 6000 Å is
(1) 1.66×10^{4} m^{-1} (2) 1.66×10^{6} m^{-1}
(3) 1.66×10^{10} m^{-1} (4) 1.72×10^{4} m^{-1}

60. The covalency of Al in $[AlCl(H_2O)_5]^{2+}$ is
(1) 3 (2) 5
(3) 4 (4) 6

61. Amphoteric oxide among the following is
(1) N_2O (2) As_2O_3
(3) Cl_2O_7 (4) CO_2

62. Symbol of element having atomic number 115 is
(1) Uun (2) Uuo
(3) Uup (4) Unp

63. The volume occupied by 14 g of N_2 gas at STP will be
(1) 22.4 L (2) 11.2 L
(3) 33.6 L (4) 5.6 L

64. In which of the options, order of arrangement does not agree with the variation of property indicated against it?
(1) C < N < O < F : (Electronegativity)
(2) C < B < Be < Li : (Atomic radius)
(3) F < N < Be < Ne : (First ionisation enthalpy)
(4) He < Xe < Ar < Ne : (Positive electron gain enthalpy)

65. Vapour phase refining is used for refining of
(1) Al (2) Cu
(3) Si (4) Ni

66. Which one of following sets of monosaccharides form lactose?
(1) β-D-galactose and α-D-glucose
(2) β-D-galactose and β-D-glucose
(3) α-D-galactose and β-D-glucose
(4) α-D-galactose and α-D-glucose

67. Excess concentration in drinking water of which ion causes laxative effect?
(1) Nitrate (2) Carbonate
(3) Sulphate (4) Nitrite

68. On partial hydrolysis of XeF_6, which is not formed as the product?
(1) XeO_2F_2 (2) $XeOF_4$
(3) HF (4) XeO_3

69. Among the following which species is least likely to exist?
(1) SiF_6^{2-} (2) $[Sn(OH)_6]^{2-}$
(3) $SiBr_6^{2-}$ (4) $[GeCl_6]^{2-}$

70. Thermosetting ploymer among the following is
(1) Polythene
(2) Polyvinyls
(3) Urea-formaldehyde resins
(4) Neoprene

71. Non-narcotic analgesics among the following is
(1) Aspirin (2) Codeine
(3) Equanil (4) Morphine

72. Number of 'P – OH' bond(s) in pyrophosphoric acid is
(1) 2 (2) 3
(3) 4 (4) 1

73. Select the least stable carbocation among the following

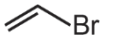
(1) $(CH_3)_3\overset{+}{C}$

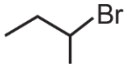
(2) $CH_2 = CH - \overset{+}{C}H - CN$

(3) $CH_2 = CH - \overset{+}{C}H_2$

(4) $CH_2 = CH - \overset{+}{C}H - CH_3$

74. The compound which will react fastest by S_N1 mechanism is

(1)  (2) 

(3)  (4) 

75. Pair of ions having same value of magnetic moment is

(1) Cu^{2+}, Zn^{2+} (2) Ni^{2+}, Co^{2+}

(3) Cu^{2+}, Ti^{3+} (4) Cr^{2+}, Mn^{2+}

76. Aqueous solution having maximum conductivity at 298 K is

(1) 0.1 M CH_3COOH (2) 0.1 M NaCl

(3) 0.1 M $K_4[Fe(CN)_6]$ (4) 0.1 M CH_3COONa

77. Number of isomers of $[CrCl_2(ox)_2]^{3-}$ is

(1) 5 (2) 4

(3) 3 (4) 2

78. The osmotic pressure of 0.2 M aq. glucose solution at 27ºC is

(1) 2.46 atm (2) 4.92 atm

(3) 3.12 atm (4) 1.20 atm

79. Which of the following compounds gives positive Iodoform test?

(1) Benzophenone

(2) Acetophenone

(3) Formaldehyde

(4) Benzaldehyde

80. For the equilibrium, $CO(g) + \frac{1}{2}O_2(g) \rightleftharpoons CO_2(g)$

The correct relationship is

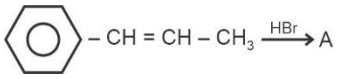
(1) $K_p = K_c(RT)^{-1}$

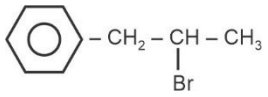
(2) $K_p = K_c(RT)^{-1/2}$

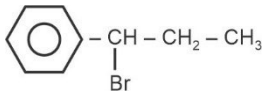
(3) $K_p = K_c(RT)$

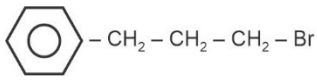
(4) $K_p = K_c(RT)^{1/2}$

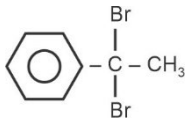
81. The major product (A) of the following reaction is



(1) 

(2) 

(3) 

(4) 

82. pH of 0.01 M HCl solution is

(1) 2 (2) 1

(3) 0 (4) 3

83. Which among the following is a positively charged sol?

(1) Gelatin sol (2) As_2S_3 sol

(3) Methylene blue sol (4) Charcoal sol

84. In NaCl, Rock salt structure, Na^+ ions occupy

(1) All the octahedral voids

(2) All the tetrahedral voids

(3) Alternate tetrahedral voids

(4) All the octahedral voids and half of tetrahedral voids

85. The correct order of first ionisation enthalpy is

(1) Zn > Co > Cu > Ni

(2) Co > Ni > Cu > Zn

(3) Zn > Cu > Ni > Co

(4) Ni > Co > Zn > Cu

SECTION-B

86 Non-aromatic species among the following is

(1) 

(2) 

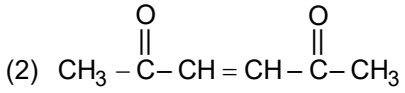
(3) 

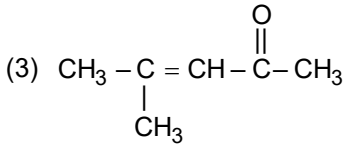
(4) 

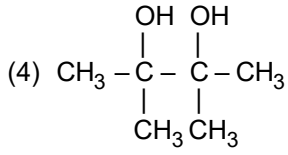
87. $CH_3COCH_3 \xrightarrow[(II)\ \Delta]{(I)\ NaOH(dil)}$ product,

Major product is

(1) CH_3CH_2COOH

(2) 

(3) 

(4) 

88. Which of the following is incorrect for a cyclic process?

(1) $\Delta H = 0$ (2) $\Delta U = 0$

(3) $\Delta S = 0$ (4) $W = 0$

89. If Rate constant of a chemical reaction is $4.606 \times 10^{-3}\ s^{-1}$ then the time required for the completion of 50% of the reaction is

(1) 150.5 s (2) 300 s

(3) 200.5 s (4) 400 s

90. Oxidation number of Cr in CrO_5 is

(1) 3 (2) 8

(3) 6 (4) 5

91. Select the metal hydroxide of maximum thermal stability among the following

(1) $Mg(OH)_2$ (2) $Ba(OH)_2$

(3) $Ca(OH)_2$ (4) $Sr(OH)_2$

92. When CaC_2 reacts with D_2O then It gives

(1) C_2H_2 (2) C_2D_2

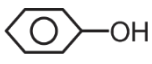
(3) CH_4 (4) CD_4

93. In victor meyer's test of alcohols, which among the following will give red colour?

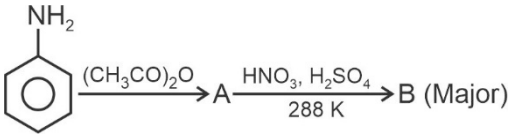
(1) $(CH_3)_2CH - OH$

(2) $CH_3CH_2 - OH$

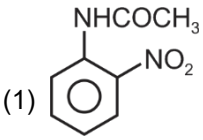
(3) $(CH_3)_3C - OH$

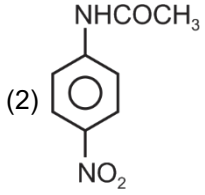
(4) 

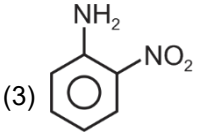
94. Consider the following reaction sequence

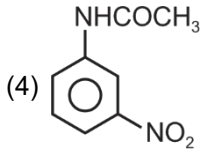


Major product B is

(1) 

(2) 

(3) 

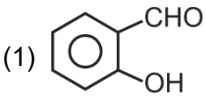
(4) 

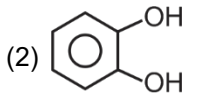
95. Ratio of rate of diffusion of H_2 and O_2 under identical condition of temperature and pressure will be

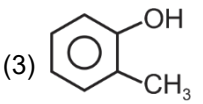
(1) 8 : 1 (2) 16 : 1

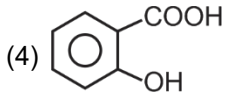
(3) 4 : 1 (4) 2 : 1

96. Intramolecular hydrogen bonding is not possible in

(1) 

(2) 

(3) 

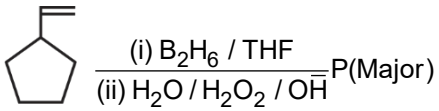
(4) 

97. Which among the following has highest dipole moment?

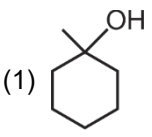
(1) CH_2Cl_2 (2) CH_3Cl

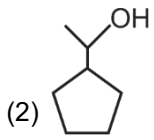
(3) CCl_4 (4) $CHCl_3$

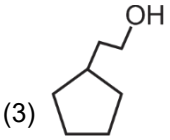
98. Consider the following reaction

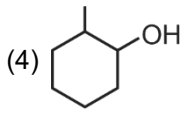


Major product P is

(1) 

(2) 

(3) 

(4) 

99. Dead burnt plaster is
(1) $CaCO_3$
(2) $CaSO_4$
(3) $CaSO_4 \cdot \frac{1}{2}H_2O$
(4) $CaSO_4.2H_2O$

100. Which among the following is an intensive property?
(1) Mass
(2) Volume
(3) Entropy
(4) Pressure

BOTANY

SECTION-A

101. Which of the given enzymes is not required during DNA replication on template with polarity $3' \rightarrow 5'$?
(1) DNA dependent DNA polymerase
(2) DNA dependent RNA polymerase
(3) DNA polymerase I
(4) DNA ligase

102. If the percentage of adenine in dsDNA is 28% then what will be the total percentage of adenine and guanine bases in this DNA?
(1) 44% (2) 22%
(3) 50% (4) 28%

103. Read the given statements, stating them true (T) or false (F) and select the **correct** option.
A. Centrioles help in formation of basal bodies which gives rise to cilia and flagella.
B. Microfilaments are mainly composed of a filamentous protein actin but have globular protein myosin also.
C. Position of future cell plate in plant cells is determined by microtubules.
D. The two ribosomal subunits remain united with each other due to specific concentration of Mn^{2+}.

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

104. In which of the given chromosomes unequal arms can be distinguished?
A. Metacentric B. Sub-metacentric
C. Acrocentric D. Telocentric
The **correct** option is
(1) Both A and B (2) Both B and C
(3) Both C and D (4) Both A and D

105. What will be the amount of DNA in G_2 phase of cell cycle if the cell has 5 pg DNA after meiosis-II?
(1) 5 pg (2) 10 pg
(3) 2 pg (4) 20 pg

106. In oocytes of some vertebrates, which of the given sub-stages of prophase-I lasts for months or year?
(1) Diplotene (2) Diakinesis
(3) Zygotene (4) Pachytene

107. 'Reproduction is synonymous with growth'. This statement is well justified w.r.t. which of the given organisms?
(1) *Amoeba* (2) *Planaria*
(3) *Hydra* (4) Moss

108. Match the columns w.r.t. taxonomical aids with their functions and select the **correct** option.

	Column I		Column II
a.	Herbarium	(i)	Collection of preserved plants and animals which are used for study and reference
b.	Botanical garden	(ii)	Quick source of reference in taxonomical studies
c.	Museum	(iii)	Analytical in nature
d.	Key	(iv)	*Ex-situ* conservation strategy of plant

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

109. Members of how many kingdoms w.r.t Whittaker's classification system are only heterotrophic?
(1) 4 (2) 2
(3) 1 (4) 3

110. Which of the given are benefits to plants from mycorrhizal association?

A. Nourishment from root cortical cells

B. Shelter

C. Surface area for absorption increases

D Enhanced supply of H_2O, N, P, S

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

(3) Both C and D (4) Both A and D

111. Select the **incorrect** statement w.r.t. cymose inflorescence.

(1) Flowers are borne in acropetal succession.

(2) The peduncle terminates into a flower

(3) It is exemplified with the flowers of *Begonia* and Teak.

(4) The main axis has a limited growth

112. Which of the given symbol represents epiphyllous condition?

(1) $\overset{\frown}{C\ A}$ (2) $\overset{\frown}{P\ A}$

(3) % (4) $\oplus$

113. In monocot leaf vascular bundles are nearly similar in size, **because**

(1) Mesophyll cells are not differentiated

(2) Absence of bulliform cells

(3) Equal distribution of stomata on lower and upper epidermis

(4) Presence of parallel venation

114. Read the given statements and select the **correct** option.

Statement A: All the tissue outside vascular cambium constitute the bark.

Statement B: Cork cambium is also called extra-stelar cambium.

(1) Only statement A is correct

(2) Only statement B is correct

(3) Both statements are correct

(4) Both statements are incorrect

115. In which of the given algae, the stored food is structurally very similar to amylopectin and glycogen?

(1) *Polysiphonia*

(2) *Volvox*

(3) *Laminaria*

(4) *Fucus*

116. The process of absorption of water by hydrophilic solid particles of a substance without forming a solution is called

(1) Imbibition (2) Plasmolysis

(3) Guttation (4) Transpiration

117. Facilitated transport differs from active transport as the former

(1) Requires special membrane proteins

(2) Is highly selective in nature

(3) Respond to protein inhibitors

(4) Is a downhill transport

118. *Pseudomonas* is a group of bacteria helpful in carrying out

(1) N_2-fixation

(2) Reduction of nitrates present in soil to gaseous nitrogen

(3) Nitrification

(4) Oxidation of nitrite to nitrate

119. During nodule formation, a stage involves curling of root hairs. Which of the given is most appropriate reason w.r.t. such event?

(1) Secretion of specific chemical by legume roots

(2) Release of *Nod* factors on root hairs by bacteria

(3) Colonising of Rhizobia on root hair cells

(4) Attachment of Rhizobia to epidermal cell

120. Select the **incorrect** statement w.r.t non-cyclic photophosphorylation.

(1) It is performed by collaboration of both photosystems I and II

(2) The process does not require an external electron donor

(3) It is connected with production of assimilatory power

(4) It occurs in granal thylakoids

121. The primary acceptor of CO_2 in C_3 pathway is a

(1) 5-C compound (2) 3-C compound

(3) 4-C compound (4) 2-C compound

122. Select the **incorrect** match.

(1) Acetyl CoA – Terpenes

(2) Succinyl CoA – Pyrimidines

(3) Oxaloacetic acid – Alkaloids

(4) α-ketoglutaric acid – Amino acid synthesis

123. The term 'floating respiration' is used for the oxidation of
(1) Fat (2) Protein
(3) Carbohydrate (4) Both (1) and (3)

124. Which of the given plant hormone delay senescence of leaves and other organs?
(1) Ethylene (2) Cytokinin
(3) Gibberellins (4) Abscisic acid

125. Which of the given plants do not show any correlation between exposure to light duration and induction of flowering response?
(1) Soyabean (2) Radish
(3) Tobacco (4) Cucumber

126. Individuals produced by asexual reproduction are
(1) Genetically similar but morphologically different
(2) Morphologically similar but genetically different
(3) Genetically and morphologically similar
(4) Genetically and morphologically different

127. Select the **incorrect** statement w.r.t. most of the species of *Chara*.
(1) They are monoecious
(2) The globule occupies an upper position than nucule
(3) Exhibit protandrous condition
(4) Sex organs are jacketed

128. If an endosperm of an angiosperm has 27 chromosomes, what would be the number of chromosomes in the megaspore mother cell of the same plant?
(1) 90 (2) 18
(3) 27 (4) 36

129. Pollen grain has a prominent two layered wall.
Select the **incorrect** statement w.r.t. outer wall.
(1) It is thick and continuous without apertures
(2) Exhibits a fascinating array of pattern and design which is of taxonomic significance
(3) Made up of sporopollenin
(4) It is also known as exine

130. In a dihybrid cross of Mendel's experiment, what will be the probability of plants which are homozygous for both the traits in F_2 generation?
(1) 25% (2) 50%
(3) 6.25% (4) 12.5%

131. In which genetic disorder each cell in the affected person has only one sex chromosome XO?
(1) Turner's syndrome
(2) Klinefelter's syndrome
(3) Bleeder's disease
(4) Sickle cell anemia

132. In Griffith's experiment injection of which of the given strains of *Streptococcus* bacterium causes death of mice?
a. S strain alone
b. S strain (heat-killed)
c. R strain alone
d. S strain (heat-killed) + R-strain (live)
(1) Both a and b
(2) Both b and c
(3) Both c and d
(4) Both a and d

133. The *lac* operon is switched off when repressor protein produced by regulatory gene binds to _____.
(1) *Lac*-z gene (2) Operator gene
(3) Promoter gene (4) Structural gene

134. In a garden there are 4000 ants living in an ant hole. In a month there are 200 births and 100 ants died. What should be the growth rate of population of ants in that month?
(1) 100 ants/month
(2) 200 ants/month
(3) 300 ants/month
(4) 250 ants/month

135. Which of the following is **true** for carrying capacity (K)?
(1) When N = K, the birth rate in a population is zero
(2) K is always determined by amount of food in an environment
(3) In a population at its K, the birth rate equals to the death rate
(4) The rate of population growth in an environment with unlimited resources is proportional to K

SECTION-B

136. Mark the **incorrect** statements w.r.t 'humus'.
(1) It is obtained from detritus by the process of decomposition
(2) Undergoes decomposition at an extremely slow rate
(3) It is dark coloured, amorphous, more or less decomposed organic matter poor in cellulose, lignin, etc
(4) Functions as reservoir of nutrients

137. Which of the given organisms form base of the food chain?
(1) Grasshopper (2) Lion
(3) Wolf (4) Phytoplanktons

138. Select the **incorrect** match w.r.t. biodiversity in Amazonian rainforest.
(1) Mammals – 427 (2) Amphibians – 427
(3) Birds – 378 (4) Fishes – 3000

139. Which of the following organism is an example of recent extinction in Africa?
(1) Dodo (2) Quagga
(3) Thylacine (4) Steller's sea cow

140. As the exhaust passes through catalytic converter, carbon monoxide and nitric oxide are changed to
(1) CO_2 and H_2O (2) CO_2 and N_2
(3) H_2O and N_2 (4) Only CO_2

141. Which of the given event can be observed when there is a sharp decline in dissolved oxygen downstream from the point of sewage discharge into a river?
(1) Mortality of aquatic creatures
(2) Growth of fishes
(3) Decline in BOD
(4) Increase in dissolved oxygen

142. During somatic hybridisation, plant cells are first treated with which of the following?
A. Pectinase
B. Sodium nitrate
C. Polyethylene glycol
D. Cellulase
(1) Both A and B (2) Both B and C
(3) Both C and D (4) Both A and D

143. Pusa Komal is bred by hybridisation and selection for resistance to bacterial blight is a variety of
(1) Wheat (2) Cowpea
(3) *Brassica* (4) Cauliflower

144. During physical process w.r.t. sewage treatment, all solids that settle forms the A, and the supernatant forms the B.
Select the **correct** option which fills A and B.
(1) A – Primary sludge, B – Primary effluent
(2) A – Flocs, B – Primary sludge
(3) A – Activated sludge, B – Anaerobic sludge
(4) A – Activated sludge, B – Effluent

145. Which of the given bioactive molecule is used as an immunosuppressive agent in organ-transplant patient?
(1) Cyclosporin A (2) Statins
(3) Lipase (4) Streptokinase

146. Select **incorrect** match.
(1) *Selaginella* – Homosporous sp.
(2) In bryophytes – Biflagellated antherozoids.
(3) Plant body in pteridophytes – Sporophyte (2n)
(4) *Cycas* – Pinnate leaves

147. In gymnosperms pollination takes place by
(1) Insects (2) Wind
(3) Animals (4) Bat

148. Colourblindness is a
(1) Autosomal recessive disorder
(2) Autosomal dominant disorder
(3) X-linked recessive disorder
(4) Y-linked recessive disorder

149. Select **correct** match
(1) Half inferior ovary – China rose
(2) Superior ovary – Rose
(3) Inferior ovary – Cucumber
(4) Epigynous flower – Mustard

150. What is **not correct** w.r.t. polyblend?
(1) It is a fine powder of recycled modified plastic
(2) It is mixed with bitumen, used to lay roads
(3) Mixture of polyblend and bitumen help to increase road life
(4) It is recycled product of e-wastes

ZOOLOGY

SECTION-A

151. Select the **correct** option

(1) *Sycon, Euspongia, Spongilla* – Water vascular system

(2) Sea anemone, Sea pen, Sea fan – Metagenesis

(3) *Taenia*, *Fasciola*, *Ascaris* – Dioecious with internal fertilisation

(4) *Locusta*, *Laccifer*, *Apis* – Economically important insects

152. Both *Corvus* and *Camelus*

(1) Exhibit homeothermy

(2) Are oviparous

(3) Do not permit pulmonary respiration

(4) Have pneumatic bones

153. In humans, the term 'stratum germinativum' is associated with type of epithelium constituted by more than one layer of cells. This type of epithelium cannot be found in/at

(1) Dry surface of skin

(2) Pharynx

(3) Tubular parts of nephrons

(4) Buccal cavity

154. Which of the following is true for muscle fibres composing biceps?

(1) We are able to make them contract by thinking about them

(2) Fibres taper at both ends

(3) Presence of intercalated discs

(4) Branched and multinucleated appearance

155. Paired structures exclusively found in **male** *P. americana* are

(1) Spermathecae

(2) Conglobate glands

(3) Caudal styles

(4) Maxillae & mandibles

156. Select the **incorrect** option w.r.t. cockroach.

(1) Arthrodial membrane is thin and flexible

(2) Hepatic caecae occur at the junction of foregut and midgut

(3) 20 holes called spiracles are present on the lateral side of its body

(4) Exchange of nitrogenous wastes occurs by diffusion at the tracheoles present within Malpighian tubules

157. Read the items listed in box below

Ribose, serine, tryptophan, adenine, lecithin, calcium, trypsin, insulin, inulin

How many among these will be obtained in retentate fraction upon homogenising a piece of living tissue?

(1) 1 (2) 3

(3) 2 (4) 4

158. Select the **incorrect** match

(1) Trihydroxypropane – Glycerol

(2) Substituted methane – Phenylalanine

(3) Heterocyclic rings – Adenosine

(4) Heteropolysaccharide – Chitin

159. Substituted pyrimidine exclusively found in DNA is (i) while substituted purine found in it is (ii) .

Select the **correct** option.

	(i)	**(ii)**
(1)	Adenine	Thymine
(2)	Thymine	Adenine
(3)	Thymidine	Adenosine
(4)	Deoxythiamine	Deoxythymine

160. Choose the **mismatch**.

(1)	Stomach	–	Presence of mucosal folds rugae
(2)	Colon	–	Maximum absorption of water occurs here in alimentary canal
(3)	Duodenum	–	Presence of mucosal folds villi
(4)	Pancreas	–	Situated between limbs of C-shaped duodenum

161. Components absent in digestive juice secreted by exocrine part of composite gland associated with human alimentary canal is
(1) Lipases and chymotrypsinogen
(2) Amylase and nuclease
(3) Biliverdin and bicarbonates
(4) Amylase and procarboxypeptidase

162. An overdose of proton pump inhibitor will impact HCl production in gastric part of alimentary canal. This will greatly impact the activity of
(1) Rennin (2) Lactase
(3) Enterokinase (4) Salivary amylase

163. Select the **correct** statement
(1) Total lung capacity is the total volume of air accommodated in the lungs at the end of normal inhalation
(2) Part of the diffusion membrane in alveoli comprises the basement substance which is composed of a thin basement membrane supporting the squamous epithelium and the basement membrane surrounding endothelial cells of capillaries
(3) In occupational disorders such as emphysema and silicosis, residual volume increases with time
(4) pO_2 is higher in systemic veins than pCO_2 in systemic arteries

164. In humans, how much CO_2 is delivered by 5 L of deoxygenated blood to alveoli?
(1) 200 ml (2) 200 L
(3) 250 ml (4) 2 L

165. Neutrophils are cells
(1) That produce anticoagulant heparin
(2) Primarily responsible for resisting helminthic infections
(3) With a nucleus and are most abundant among leukocytes
(4) Lacking a nucleus and also considered phagocytic in nature

166. Number of double circulations completed in a healthy human heart per minute are
(1) 12
(2) 16
(3) 72
(4) 36

167. Reabsorption of water from latter or distal parts of the renal tubules is facilitated by which hormones?
a. Oxytocin
b. Vasopressin
c. ADH
d. Aldosterone
e. ANF
Select the **correct** option.
(1) a, c, d (2) b, c, d
(3) c, d, e (4) a, b, e

168. Which of the following is not true for cortical nephrons?
(1) Absence of peritubular capillary network
(2) Vasa recta is absent or highly reduced
(3) Smaller in size but larger in number than JG nephrons
(4) Malpighian body or renal corpuscle is located in outer renal cortex

169. Property common between muscle fibres and neural fibres is
(1) Contractility (2) Excitability
(3) Elasticity (4) Extensibility

170. Select the **correct** option w.r.t. true and false in humans.
a. The pectoral girdle comprises 4 bones while pelvic girdle has two coxal bones.
b. Joint described between first cervical vertebra and occipital condyles of skull is synovial, pivot joint.
c. Consumption of Saheli leads to enhanced cases of osteoporosis in menopausal females.
d. Number of mitochondria is fewer in white muscle fibres than red muscle fibres.
(1) a(T), b(F), c(F), d(T)
(2) a(F), b(T), c(F), d(T)
(3) a(T), b(T), c(T), d(F)
(4) a(F), b(F), c(T), d(F)

171. With which part of CNS are terms such as corpora quadrigemina and cerebral aqueduct associated?
(1) Forebrain (2) Midbrain
(3) Hind brain (4) Spinal cord

172. Read the given statements

A. Lemon drops are generally served on aeroplanes just before take off that eventually help in opening of Eustachian tube.

B. Receptors in vestibular part of inner ear are responsible for maintaining both static and dynamic equilibrium of the body.

Select the **correct** option

(1) Only statement A is correct

(2) Only statement B is correct

(3) Both statements A and B are incorrect

(4) Both statements A and B are correct

173. Choose the **incorrect** match

(1)	Cornea	–	Maximum refraction of light occurs
(2)	Aqueous humor	–	Replenishable, thin watery fluid
(3)	Vitreous humor	–	Present in the chamber between lens and retina
(4)	Macula lutea	–	Harbors fovea and serves as exit point of optic nerve

174. Select the hormone which can enter inside the target cell.

(1) Thyroxine (2) Thymosin

(3) Thyrocalcitonin (4) Parathormone

175. Select the **correct** option

	Hormone	Source	Target/Function
(1)	Glucagon	α-cells of pancreas	Hepatocytes, stimulates glycogenolysis
(2)	Cortisol	Zona glomerulosa	Stimulates gluconeogenesis
(3)	Oxytocin	Posterior pituitary	Uterine endometrium, muscular contractions
(4)	Somatostatin	Hypothalamus	Posterior pituitary, promotes release of GH

176. Gamete formation does not occur in which of the following?

(1) *Hydra* (2) *Paramecium*

(3) *Periplaneta* (4) *Pheretima*

177. Chromosome number in meiocytes of *Canis* is 78. What is the chromosome number in gametes of *Felis*?

(1) 78 (2) 39

(3) 38 (4) 19

178. Secretions from which male accessory glands primarily help in the lubrication of penis?

(1) Bartholin's glands

(2) Bulbourethral glands

(3) Seminal vesicles

(4) Prostate glands

179. Chromosome number is 23/cell in case of

(1) Secondary spermatocytes and second polar body

(2) Primary oocyte and first polar body

(3) Spermatids and oogonia

(4) Spermatogonia and primary spermatocyte

180. Which of the following is true for hormones released by temporary endocrine gland in ovary of a female?

(1) The first hormone to peak during luteal phase is progesterone

(2) The second hormone to peak during luteal phase is essential for maintenance of endometrium during pregnancy

(3) The hormones released by this temporary endocrine gland exerts positive feedback on hypothalamus

(4) These hormones appear in urine in menopausal phase

181. Select the **false** statement in context of humans.

(1) Colostrum is rich in IgA and provides immunity to foetus

(2) Presence of X or Y chromosome in the sperm determines the sex of the embryo

(3) Body of foetus is covered with fine hair, eyelids separate and eyelashes are formed by end of second trimester

(4) hCG in first trimester helps to maintain corpus luteum

182. Read the given statements and choose the **correct** one.
(1) Amniocentesis can detect disorders resulting from chromosomal abnormalities including Down's syndrome and cleft palate
(2) Statutory ban on amniocentesis exists in India to prevent female foeticide
(3) High growth rate of population size in India is a result of rise in maternal mortality rate and also increase in number of people in reproducible age group
(4) MTP is widely used as a contraceptive method worldwide

183. Choose the **correct** option that completes the analogy
Hepatitis-B : Virus :: Trichomoniasis : _____
(1) Virus (2) Fungi
(3) Bacteria (4) Protozoa

184. Relatively significantly high levels of progesterone can be observed in a female exercising the use of
(1) Saheli (2) Steroidal oral pill
(3) Cervical caps (4) Periodic abstinence

185. Select the **incorrect** statement in context of method that involves mating between closely related individuals of same breed.
(1) It can help to expose and eliminate harmful recessive characters
(2) Increase in heterozygosity due to this method results in enhanced productivity and fertility example Hisardale
(3) Pure lines can be produced through use of this method
(4) This method, over a long period of time can lead to inbreeding depression

SECTION-B

186. Select the **incorrect** match/option.

(1)	Dengue, Chikungunya, Polio	–	Viral diseases
(2)	Charas, Marijuana, Ganja	–	*Cannabis sativa*
(3)	Computed tomography, MRI, Chemotherapy	–	Diagnostic techniques for cancer
(4)	Peyer's patches, appendix, spleen	–	Sites for interaction of lymphocytes with the antigen

187. Which of the following is not true?
(1) Drug addicts who inject drugs are highly susceptible to acquiring HIV than those who have multiple sexual partners using condoms
(2) Ebola virus and HIV can be transmitted through semen but not diphtheria
(3) Rupture of erythrocytes in infected female *Anopheles* results in release of hemozoin which is responsible for chills and fever in malaria
(4) Nicotine can mimic effects of sympathetic branch of autonomic nervous system

188. They possibly lived in East African grasslands. Their cranial capacity was likely less than that of members belonging to genus *Homo*. They lived 2-4 mya and walked upright. 'They' refers to
(1) Creatures whose fossils were discovered in 1891 and who probably ate meat
(2) Creatures whose cranial capacity was nearly 900 cc
(3) Creatures that used hides to protect their body
(4) Creatures that were not taller than 4 feet and their fossils were found in Tanzania and Ethiopia

189. Microbial experiments conducted by whom, showed that pre-existing advantageous mutations when selected will result in new phenotypes?
(1) Joshua Lederberg (2) Charles Darwin
(3) Lamarck (4) Hugo de Vries

190. The category of Australian marsupials does not include
(1) Numbat (2) Bobcat
(3) Wombat (4) Bandicoot

191. How many among following arose directly from Psilophyton?

Cycads, Sphenopsids, Ferns, Seed ferns, Herbaceous lycopods, *Rhynia*, Gnetales, Gingkos

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

192. Glyphosate is a broad spectrum herbicide that does not prevent synthesis of
(1) Tyrosine (2) Threonine
(3) Phenylalanine (4) Tryptophan

193. Nucleic acid-based diagnostic method for early detection of a disease is

(1) ELISA

(2) Western blotting

(3) PCR

(4) Urine analysis

194. During gene cloning and transformation experiments, absence of β-galactosidase activity is indicative of insertional inactivation of

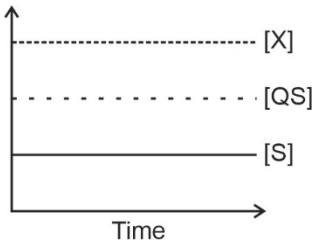
(1) *lac*-Z

(2) *amp*^{R}

(3) *tet*^{R}

(4) GFP

195. [X] = Cell density
[S] = Substrate concentration
[QS] = Cell substrate turnover



The graph above represents which type of culture?

(1) Batch culture at log phase

(2) Continuous culture of steady state

(3) Fed batch

(4) Batch culture at lag phase

196. Which of the following statement is **incorrect** w.r.t. the physical and chemical processes catalysed under the influence of an enzyme?

(1) Rate of a physical or chemical process refers to the amount of substrate formed per unit time

(2) Change in state of matter is a physical process *e.g.*, melting of ice into water

(3) A general thumb rule is that the rate doubles or decreases by half for every 10°C change in either direction

(4) Rate can also be called velocity, if the direction is specified

197. Complete the analogy

Vipera : Reptilia : : *Struthio* :

Choose the **correct** option

(1) Mammalia (2) Aves

(3) Amphibia (4) Cyclostomata

198. Select the **incorrect** match

(1)	Vomiting	–	It is the ejection of stomach contents through the mouth; a feeling of nausea precedes vomiting
(2)	Constipation	–	In this, the faeces are retained within the colon as the bowel movements occur irregularly
(3)	Indigestion	–	In this, food is properly digested which leads to a feeling of fullness
(4)	Jaundice	–	In this, the liver is affected, skin and eyes turn yellow due to the deposit of bile pigments

199. The primary function of sweat is to

(1) Eliminate hydrocarbons

(2) Excrete out sterols

(3) Get rid of waxes

(4) Facilitate a cooling effect on the body surface

200. Which of the following statement is not **correct** w.r.t. rib cage?

(1) A rib has two articulation surfaces on its dorsal end

(2) True ribs are dorsally attached to the cervical vertebrae and ventrally connected to the sternum

(3) 8th, 9th and 10th pairs of ribs are termed as false ribs

(4) Floating ribs are not connected ventrally with the sternum

❑ ❑ ❑