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MM : 720

NEET 720-MOCK TEST SERIES for NEET-2022

Time : 3 Hrs.

MOCK TEST - 5

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. One Becquerel is SI unit of radioactivity, it is equal to

   (1) 1 disintegration per second

   (2) 10^6 disintegration per second

   (3) 3.7×10^{10} disintegration per second

   (4) 10^{10} disintegration per second

2. The magnitude of resultant of two coplanar vectors 20 m at 0° with *x*-axis and 10 m at 120° with *x*-axis, will be

   (1) 15.3 (2) 17.3

   (3) 14.6 (4) 19.2

3. The radius of the ball is (5.2 ± 0.2) cm. The percentage error in volume of the ball is nearly

   (1) 7%

   (2) 9%

   (3) 11.5%

   (4) 3%

4. A particle traversed $\frac{3}{4}$ of the circle of radius R in time t. The magnitude of average velocity of the particle in this time interval is

   (1) $\frac{\pi R}{t}$ (2) $\frac{3\pi R}{2t}$

   (3) $\frac{\sqrt{2}R}{t}$ (4) $\frac{R}{\sqrt{2}t}$

5. A pebble is thrown vertically upwards from the edge of bridge with an initial velocity of 4.9 m/s. It strikes the water below the bridge after 2 s. The height of the bridge is

   (1) 4.9 m (2) 14.7 m

   (3) 16.2 m (4) 9.8 m

6. A man crosses a river by swimming. If he crosses river in minimum time of 10 minutes. The river speed in 4 km/hr. What was speed of swimmer with respect to river, if its width is 400 m?

   (1) 2.4 km/hr (2) 3.2 km/hr

   (3) 6.2 km/hr (4) 5.1 km/hr

7. When two balls are projected at angles 60° and 45° to horizontal, their maximum height reached are same, what is ratio of their respective initial speeds?

(1) 2 : 3 (2) $\sqrt{3} : \sqrt{2}$

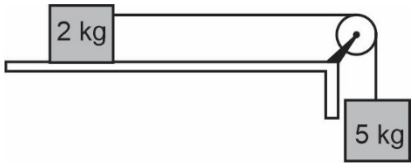
(3) $\sqrt{2} : \sqrt{3}$ (4) 1 : 1

8. The momentum p (kg ms^{-1}) of a particle is varying with time (second) as $p = 4 + 5t^2$. The force on the particle at $t = 2$ s is

(1) 12 N (2) 16 N

(3) 18 N (4) 20 N

9. A 2 kg mass placed on a horizontal table and is attached by an ideal string which is connected with another mass of 5 kg passing over the ideal pulley as shown in diagram. What is the tension in string. (g = 10 m/s^2), consider surface of table as smooth



(1) $\frac{200}{7}$ N (2) $\frac{100}{7}$ N

(3) $\frac{50}{7}$ N (4) 64 N

10. A body of mass 0.8 kg has initial velocity of $(3\hat{i} - 4\hat{j})$ m/s and final velocity of $(-6\hat{j} + 2\hat{k})$ m/s. What is change in kinetic energy of the body?

(1) 6 J (2) 12 J

(3) 9 J (4) 7 J

11. A block of mass 1 kg slides down a rough inclined plane of inclination 60° starting sliding from its top. If the coefficient of kinetic friction is 0.5 and length of the plane is 2 m, then work done against friction when block reach the bottom is

(1) 4.9 J (2) 19.6 J

(3) 9.8 J (4) 2.45 J

12. A particle moves in a circle of radius 0.5 m at a speed that uniformly increases. What is average angular acceleration if its speed changes from 2 m/s to 4 m/s in 4 s?

(1) 2 rad/s^2 (2) 1 rad/s^2

(3) 3 rad/s^2 (4) 4 rad/s^2

13. A body of mass m moving with velocity v collides elastically head on with another body of mass $2m$ which is initially at rest. The ratio of kinetic energy of colliding body before and after collision is

(1) 3 : 1

(2) 4 : 1

(3) 9 : 8

(4) 9 : 1

14. Moment of inertia of uniform circular disc about a diameter is I. Its moment of inertia about an axis perpendicular to its plane and passing through a point on its rim will be

(1) $5I$

(2) $3I$

(3) $6I$

(4) $4I$

15. A solid sphere has mass of 5 kg and radius 10 cm rolls without slipping with velocity of 20 m/s. Total kinetic energy of the sphere is

(1) 280 J (2) 140 J

(3) 1400 J (4) 920 J

16. An astronaut orbiting the earth in a circular orbit 1000 km above the surface of earth, gently drops a ball out of spaceship. The ball will

(1) Fall vertically down to the earth

(2) Will remain stationary at the point of release

(3) Will move along with the spaceship

(4) Will move randomly in any direction

17. A hydraulic automobile is designed to lift car with a maximum mass of 3000 kg. The area of cross-section of piston carrying load is 425 cm^2. What maximum pressure would the smaller piston have to bear?

(1) 6.92×10^5 Nm^{-2}

(2) 3.68×10^5 Nm^{-2}

(3) 5.7×10^5 Nm^{-2}

(4) 2.1×10^6 Nm^{-2}

18. When two water droplets merge with each other to form a large droplet. In this process

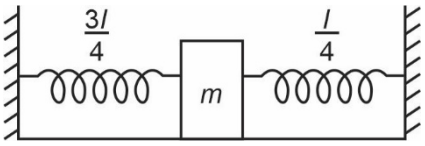
(1) Energy is liberated

(2) Energy is absorbed

(3) Some mass is converted into energy

(4) Energy is neither liberated nor absorbed

19. A spring of stiffness constant k and natural length l is cut into two parts $\frac{3l}{4}$ and $\frac{l}{4}$ respectively and an arrangement is made as shown. If the mass is slightly displaced and then released, what is the time period of oscillation?



(1) $2\pi\sqrt{\frac{3m}{2k}}$ (2) $2\pi\sqrt{\frac{3m}{16k}}$

(3) $2\pi\sqrt{\frac{3m}{4k}}$ (4) $\frac{\pi}{2}\sqrt{\frac{m}{3k}}$

20. Two tuning forks. A and B produce notes of frequency 258 Hz and 264 Hz. An unknown note sounded with A produces certain beats. When the same note is sounded with B, the beat frequency gets doubled. The unknown frequency is

(1) 270 Hz (2) 252 Hz

(3) 261 Hz (4) 268 Hz

21. Two plates of same area are placed in contact. Their thickness as well as thermal conductivities are in ratio 2 : 3. The outer surface of one plate is maintained at 10°C and that other at 0°C. What is temperature of common cross section.

(1) 6.5°C (2) 2.5°C

(3) 5.0°C (4) 4.5°C

22. When heat is given to a gas in an isothermal change the result will be

(1) Increase in internal energy

(2) Rise in temperature

(3) External work done by the gas

(4) External work done as well as increase in internal energy

23. There is an electric field E along x-axis. If work done in moving a charge of 0.2 C through a distance of 2 m along a line making an angle 60° with x-axis is 4 J. What is the value of E?

(1) 4 NC^{-1}

(2) $\sqrt{3}$ NC^{-1}

(3) 5 NC^{-1}

(4) 20 NC^{-1}

24. A 10 μF capacitor is charged to a potential of 50 V and is connected to another uncharged capacitor in parallel. Now their common potential becomes 20 V. The capacitance of second capacitor is

(1) 15 μF (2) 20 μF

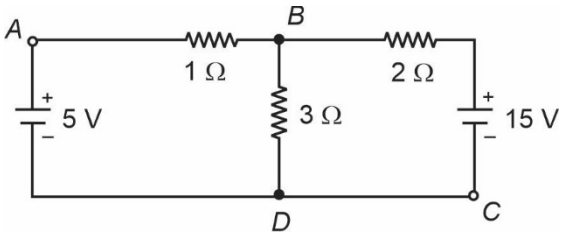
(3) 25 μF (4) 40 μF

25. A parallel plate capacitor with air between the plates is charged to a potential of 500 V and then insulated. A plastic plate is inserted between the plates filling the whole gap. The potential difference between the plates become 75 V. The dielectric constant of the plastic plate is

(1) $\frac{10}{3}$ (2) 5

(3) $\frac{20}{3}$ (4) 12

26. Current in branch BD in the shown circuit is



(1) 2.27 A (2) 3.21 A

(3) 4.61 A (4) 1. 72 A

27. A uniform potential gradient is established across a potentiometer wire. Two cells of emf E_1 and E_2 are connected to support and oppose each other are balanced over length l_1 = 6 m and l_2 = 2 m respectively in potentiometer, then $\frac{E_1}{E_2}$ is

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

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

28. An electron beam is moving with velocity of 10^6 ms^{-1} through a uniform magnetic field 0.2 T, which is perpendicular to direction of beam. What is the force acting on an electron?

(1) 3.2×10^{-14} N (2) 1.5×10^{-14} N

(3) 8×10^{-15} N (4) 6.4×10^{-14} N

29. The magnetic field due to a current carrying circular loop of radius 3 cm at a point on its axis at a distance 4 cm from centre is 54 mT. What is its value at the centre of loop?

(1) 125 mT (2) 250 mT

(3) 175 mT (4) 100 mT

30. A dip circle is taken to geomagnetic equator. The needle is allowed to move in vertical plane perpendicular to magnetic meridian. The needle will stay
(1) In horizontal plane only
(2) In vertical direction only
(3) In any direction except vertical
(4) In any direction it is released

31. The perpendicular component of external magnetic field passing through a coil of 10 turns and radius 50 mm increases from 0 to 18 T in 3 s. If the resistance of the coil is 2 Ω what is magnitude of induced current?
(1) 0.62 A (2) 0.325 A
(3) 0.235 A (4) 0.162 A

32. A motor running at full load on a 118 V line develops a back emf of 109 V and draws current of 8 A through the armature. What is armature resistance?
(1) 1.125 Ω (2) 2.175 Ω
(3) 6.12 Ω (4) 3.525 Ω

33. An electromagnet has stored 648 J of magnetic energy when a current of 9 A exists in the coil. What is emf induced if current is reduced to zero in 0.45 s?
(1) 9.2 V (2) 320 V
(3) 16.5 V (4) 72 V

34. A capacitor is in series with a resistance of 30 Ω and is connected to 220 V ac line. The reactance of capacitor is 40 Ω. What is power loss in circuit nearly?
(1) 420 W (2) 520 W
(3) 480 W (4) 580 W

35. If the speed of light in ice is 2.3×10^8 m/s. What is critical angle of incidence for light going from ice to air?
(1) $\sin^{-1}(0.143)$ (2) $\sin^{-1}(0.304)$
(3) $\sin^{-1}(0.67)$ (4) $\sin^{-1}(0.77)$

SECTION-B

36. A ray of light passes normally through a slab of refractive index $\frac{7}{5}$ and thickness 't'. If the speed of light in vacuum is 'C' then time taken by the light to go across the slab is
(1) $\frac{7t}{5C}$ (2) $\frac{5t}{7C}$
(3) $\frac{t}{C}$ (4) $\frac{t}{5C}$

37. How far should an object be from a concave spherical mirror of radius of curvature 36 cm to form a real image one ninth in size?
(1) 120 cm (2) 140 cm
(3) 160 cm (4) 180 cm

38. An amateur lens grinder wants to grind a converging lens of crown glass (n = 1.52) with the same curvature on both sides and of focal length 25 cm. What radius of curvature must he grind on each face?
(1) 26 cm (2) 20 cm
(3) 22 cm (4) 14 cm

39. In Young's interference experiment two slits are illuminated with orange light of wavelength 6000 Å. The interference pattern is observed on screen far from slit planes. If the central bright fringe is numbered as zero, what must be path difference for light from two slits at fourth bright fringe?
(1) 3 μm (2) 1.6 μm
(3) 2.4 μm (4) 3.6 μm

40. Two polaroid sheets are arranged with their axes parallel. Second polaroid is then rotated through an angle of 60°. What is ratio of light intensity transmitted in the first instance to second instance?
(1) 2 (2) 4
(3) 16 (4) 1

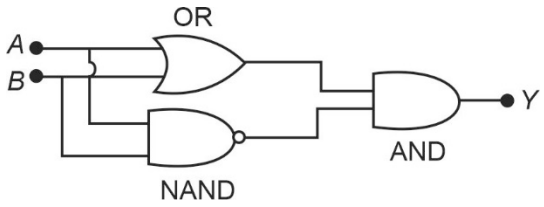
41. If the de broglie wavelength of an electron is 1 Å, what is its velocity?
(1) 5.1×10^6 m/s
(2) 6.3×10^7 m/s
(3) 7.28×10^6 m/s
(4) 5.1×10^5 m/s

42. If ionisation energy of a hydrogen atom is 13.6 eV. What is the energy of a level with quantum number n = 3?
(1) 0.85 eV (2) – 1.51 eV
(3) – 10.2 eV (4) – 24.8 eV

43. In a full wave rectifier circuit operating from 50 Hz mains supply, the fundamental frequency in ripple would be
(1) 50 Hz
(2) 40 Hz
(3) 70.7 Hz
(4) 100 Hz

44. When p-n junction diode is forward biased then
(1) Both the depletion region and barrier height are reduced
(2) The depletion region is widened and barrier height are reduced
(3) The depletion region is reduced and barrier height is increased
(4) Both the depletion region and barrier height are increased

45. The following configuration of gate is equivalent to



(1) NAND (2) NOR
(3) XOR (4) OR

46. Which of the following is not a characteristics of diamagnetism?
(1) The diamagnetic materials are repelled by a magnetic field
(2) Susceptibility of diamagnetic materials is inversely proportional to the absolute temperature
(3) Magnetic susceptibility of diamagnetic material is small and negative
(4) Diamagnetic material moves from a region of strong magnetic field to weak magnetic field

47. A current carrying circular coil of radius 5 cm produces a magnetic field of 7×10^{-5} T at its centre. The current flowing through the coil is
(1) 0.26 A (2) 3.6 A
(3) 4.6 A (4) 5.6 A

48. The potential difference across the terminals of a battery is 50 V when 11 A current is drawn. The potential difference is 60 V when 1 A current is drawn. The internal resistance of the battery is
(1) 1 Ω (2) 2 Ω
(3) 4 Ω (4) 5 Ω

49. For transistor action, which of the following statements is/are correct
(1) Base, emitter and collector regions should have similar size and doping concentration
(2) Both emitter junction as well as collector junction are forward biased
(3) The base region must be very thin and lightly doped
(4) Both (2) and (3)

50. The incorrect statement among the following is
(1) Sunlight is not always required for a solar cell
(2) Semiconductors with band gap close to 1.5 eV are ideal material for solar cell fabrication
(3) A solar cell works when it is reversed biased
(4) I-V characteristics for solar cell is drawn in fourth quadrant

CHEMISTRY

SECTION-A

51. 300 g of C_2H_6 is burnt in excess of oxygen. Mass of CO_2 produced is
(1) 110 g (2) 220 g
(3) 440 g (4) 880 g

52. If energy of an electron in first orbit of Hydrogen atom is –E, then energy of electron in first excited state is
(1) E
(2) –E
(3) $-\frac{E}{4}$
(4) –4E

53. For n = 3, which of the following value of m is not possible?
(1) 0 (2) –1
(3) 2 (4) –3

54. Atomic number of element Uno is
(1) 101 (2) 106
(3) 108 (4) 109

55. Hybridisation of nitrogen in NH_4^+ ion is
(1) *sp* (2) sp^2
(3) sp^3 (4) sp^3d

56. Maximum bond order among the following is of
(1) O_2 (2) N_2
(3) N_2^- (4) O_2^-

57. At same temperature and pressure density of CO is equal to the density of

(1) N_2 (2) CO_2

(3) CH_4 (4) SO_2

58. If value of compressibility factor Z = 2 for a gas, then its molar volume at S.T.P is

(1) 22.4 L (2) 11.2 L

(3) 44.8 L (4) 6.25 L

59. 2 mol of an ideal gas expands reversibly and isothermally from 1 L to 10 L at 27°C. The entropy change during the process is

(1) 690 R (2) 600 R

(3) 2.3 R (4) 4.6 R

60. Path function among the following is

(1) U (2) w

(3) H (4) G

61. If ΔH°_{vap} for H_2O is 44 kJ mol^{-1}, then amount of heat required to evaporate 9 g of H_2O is

(1) 11 J (2) 22 J

(3) 44 J (4) 88 J

62. Unit of K_C for the equilibrium

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

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

(3) mol^2 L^{-2} (4) L^2 mol^{-2}

63. Strongest base among the following is

(1) CH_3COO^- (2) Cl^-

(3) HSO_4^- (4) NO_3^-

64. If molar solubility of $Ni(OH)_2$ is *s* then value of K_{sp} for $Ni(OH)_2$ is

(1) s^2 (2) s^3

(3) $4s^2$ (4) $4s^3$

65. Which of the following species cannot undergo disproportionation?

(1) ClO^- (2) ClO_2^-

(3) ClO_3^- (4) ClO_4^-

66. Electron precise hydride among the following is

(1) NaH (2) CH_4

(3) $LaH_{2.87}$ (4) B_2H_6

67. Most stable carbonate among the following is

(1) Li_2CO_3 (2) Na_2CO_3

(3) K_2CO_3 (4) Rb_2CO_3

68. Ion which has the highest hydration enthalpy is

(1) Ba^{2+}

(2) Sr^{2+}

(3) Ca^{2+}

(4) Mg^{2+}

69. Producer gas is

(1) CO + N_2 (2) CO + H_2

(3) CO_2 + H_2 (4) CO_2 + N_2

70. Prefix used for $-NH_2$ group in IUPAC nomenclature is

(1) Amine (2) Amino

(3) Amide (4) Carbamoyl

71. Most acidic compound among the following is

(1) CH_3COOH (2) CH_3CH_2COOH

(3) CF_3COOH (4) CF_3CH_2COOH

72. Among the given options, most stable carbanion is

(1) $(CH_3)_3\overset{\ominus}{C}$ (2) $(CH_3)_2\overset{\ominus}{C}H$

(3) $CH_3\overset{\ominus}{C}H_2$ (4) $\overset{\ominus}{C}H_3$

73. $CH_4 + O_2 \xrightarrow[\Delta]{Mo_2O_3} A$

Product A in the above reaction is

(1) CH_3OH (2) HCHO

(3) HCOOH (4) CO

74. Which of the following alkene on reaction with O_3 followed by Zn/H_2O gives CH_3CHO and CH_3COCH_3?

(1) $CH_3 - CH = CH_2$

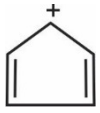
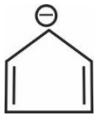
(2) $CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}} = CH_2$

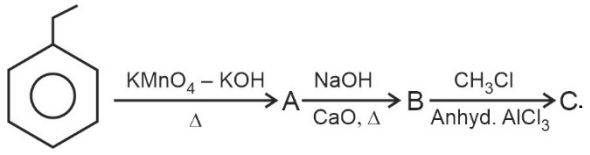
(3) $CH_3 - CH = CH - CH_3$

(4) $CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}} = CH - CH_3$

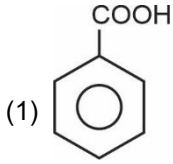
75. Aromatic species is

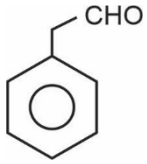
(1)  (2) 

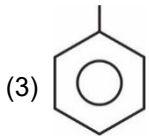
(3)  (4) 

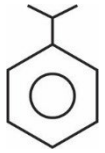
76. 

Product C in the reaction is

(1) 

(2) 

(3) 

(4) 

77. Frenkel defect is shown by

(1) AgCl (2) KCl

(3) CsCl (4) NaCl

78. Assuming 100% dissociation, maximum van't Hoff factor is of

(1) $CaCl_2$ (2) $K_4[Fe(CN)_6]$

(3) $AlCl_3$ (4) NH_2CONH_2

79. Correct Nernst equation for Daniell cell is

(1) $E_{cell} = E^o_{cell} + \frac{2.303RT}{F}\log\frac{[Zn^{2+}]}{[Cu^{2+}]}$

(2) $E_{cell} = E^o_{cell} - \frac{2.303RT}{F}\log\frac{[Zn^{2+}]}{[Cu^{2+}]}$

(3) $E^o_{cell} = E_{cell} + \frac{2.303RT}{2F}\log\frac{[Zn^{2+}]}{[Cu^{2+}]}$

(4) $E^o_{cell} = E_{cell} + \frac{2.303RT}{2F}\log\frac{[Cu^{2+}]}{[Zn^{2+}]}$

80. If 87.5% completion takes 30 min for a first order reaction then half life of the reaction is

(1) 5 minute (2) 10 minute

(3) 15 minute (4) 30 minute

81. Hair cream is an example of

(1) Gel (2) Foam

(3) Sol (4) Emulsion

82. Distillation is used for refining

(1) Sn (2) Zn

(3) Zr (4) Cu

83. Maximum boiling point is of

(1) NH_3 (2) PH_3

(3) AsH_3 (4) SbH_3

84. Which of the following contains peroxy linkage?

(1) $H_2S_2O_3$

(2) $H_2S_2O_4$

(3) $H_2S_2O_7$

(4) $H_2S_2O_8$

85. Magnetic moment of Mn^{2+} ion is

(1) 1.73 BM (2) 2.84 BM

(3) 4.90 BM (4) 5.92 BM

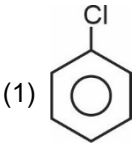
SECTION-B

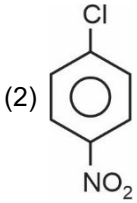
86. Hybridisation of Ni in $[NiCl_4]^{2-}$ ion is

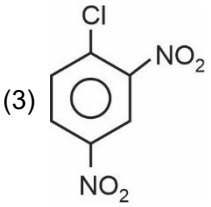
(1) sp^2 (2) sp^3

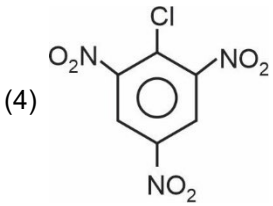
(3) dsp^2 (4) sp^3d

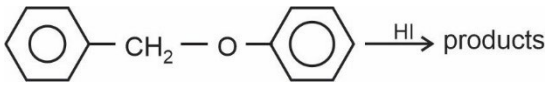
87. Most reactive haloarene towards aqueous NaOH is

(1) 

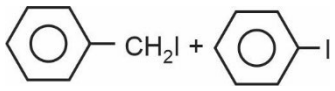
(2) 

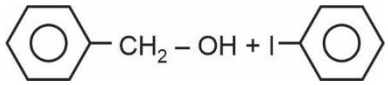
(3) 

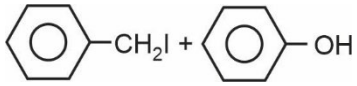
(4) 

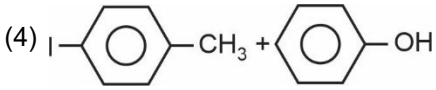
88. 

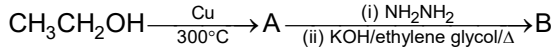
Major products in the above reaction are

(1) 

(2) 

(3) 

(4) 

89. 

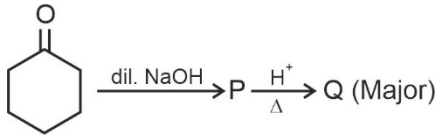
Product B is

(1) CH_3COOH

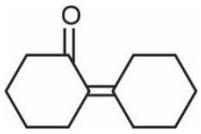
(2) $CH_3CH_2NH_2$

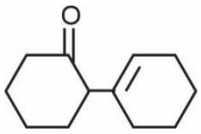
(3) CH_3CH_3

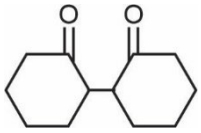
(4) $CH_3CH_2CONH_2$

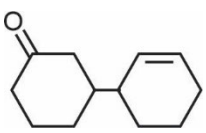
90. 

Product Q in the above reaction is

(1) 

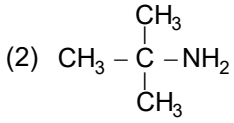
(2) 

(3) 

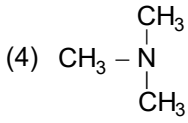
(4) 

91. Which of the following amines does not react with benzenesulphonyl chloride?

(1) CH_3NH_2

(2) 

(3) $CH_3 - NH - CH_3$

(4) 

92. Gluconic acid on oxidation gives

(1) n-Hexane

(2) Glucose

(3) Saccharic acid

(4) Glucose pentaacetate

93. Monomers of Glyptal are

(1) Ethylene glycol and phenol

(2) Ethylene glycol and phthalic acid

(3) Phenol and formaldehyde

(4) Ethylene glycol and formaldehyde

94. Tegamet is a/an

(1) Antihistamine

(2) Antacid

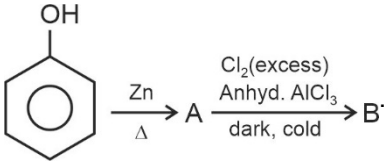
(3) Tranquilizer

(4) Analgesic

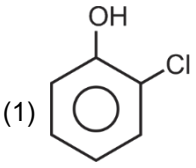
95. Maximum prescribed concentration of Cd in drinking water is

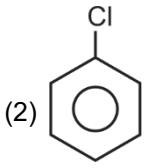
(1) 0.2 ppm (2) 0.05 ppm

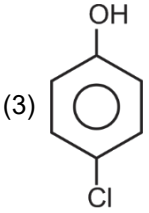
(3) 0.005 ppm (4) 5.0 ppm

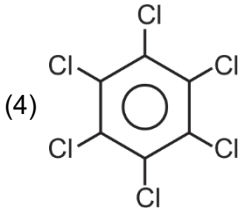
96. 

Product B in the above reaction is

(1) 

(2) 

(3) 

(4) 

97. When borax is heated in a Bunsen burner flame with CoO on a loop of platinum wire, which coloured bead is formed?

(1) Red

(2) Green

(3) Blue

(4) Orange

98. Most ionic compound is

(1) NaCl

(2) $MgCl_2$

(3) $AlCl_3$

(4) $SiCl_4$

99. Slope of lnk vs $\frac{1}{T}$ plot is

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

(2) $\frac{-E_a}{R}$

(3) $\frac{-E_a}{2303R}$

(4) $\frac{E_a}{2.303R}$

100. Zn on reaction with dilute HNO_3 gives

(1) NO

(2) NO_2

(3) N_2

(4) N_2O

BOTANY

SECTION-A

101. Reproduction is synonymous with growth in
(1) Most of the fungi
(2) Filamentous algae
(3) Protonema of mosses
(4) Amoeba

102. Select the **incorrectly** matched pair w.r.t Mango.
(1) Genus – *Mangifera*
(2) Species – *indica*
(3) Order – Poales
(4) Class – Dicotyledonae

103. *Nostoc* and *Anabaena*
(1) Are generally heterotrophic
(2) Can oxidise various inorganic substances such as nitrates, nitrites and ammonia and use the released energy for their ATP production
(3) Are majorly decomposers
(4) Play the role in nitrogen fixing

104. Which of the following statement is not true for saprophytic protists?
(1) Body moves along decaying twigs and leaves engulfing organic material
(2) They have two flagella, a short and a long one
(3) Under suitable conditions, they form an aggregation called plasmodium
(4) The spores possess true walls

105. Mushrooms, bracket fungi and puffballs are included in the group
(1) Ascomycetes (2) Basidiomycetes
(3) Deuteromycetes (4) Phycomycetes

106. Select the **odd** one w.r.t. imperfect fungi
(1) *Alternaria* (2) *Puccinia*
(3) *Colletotrichum* (4) *Trichoderma*

107. Non-motile (static) female gamete and a smaller, motile male gamete can be seen in
(1) *Spirogyra* (2) *Ulothrix*
(3) *Volvox* (4) Both (1) and (3)

108. Agar can be obtained from the pair of algae named
(1) *Laminaria and Sargassum*
(2) *Chlamydomonas and Volvox*
(3) *Gelidium and Gracilaria*
(4) *Chara and Ulothrix*

109. Which of the following is **false** for the leafy stage of gametophyte of mosses?
(1) It is a creeping, green, branched and frequently filamentous stage
(2) It develops from the secondary protonema as a lateral bud
(3) It is the second stage of gametophyte
(4) This stage bears the sex organs

110. Whorled phyllotaxy can be seen in
(1) China rose (2) *Alstonia*
(3) *Calotropis* (4) Guava

111. How many statements are **correct**?
I. Phloem fibres (bast fibres) are made up of sclerenchymatous cells.
II. Cuticle is generally present in roots.
III. In flowering plants, tracheids and vessels are the main water transporting elements.
IV. Companion cells help in maintaining the pressure gradient in the sieve tubes.
(1) Two (2) Three
(3) Four (4) One

112. Bulliform cells are
(1) Generally present in dorsiventral leaves
(2) Meant for the stomatal opening in monocot plants
(3) Colorless, empty and large present in isobilateral leaves
(4) Photosynthetic mainly

113. Which of the following scientist explained that cells divided, and new cells are formed from pre-existing cells?
(1) Anton Von Leeuwenhoek
(2) Matthias Schleiden
(3) Schwann
(4) Rudolf Virchow

114. Spindle fibres are mainly composed of
(1) Chitin (2) Tubulin
(3) Cellulose (4) Actin

115. Lipid-like steroidal hormones are synthesised in
(1) Mitochondria
(2) Rough endoplasmic reticulum
(3) Smooth endoplasmic reticulum
(4) Chloroplast

116. Select the **incorrectly** matched pair.
(1) Metaphase – Spindle fibres attachment to kinetochore
(2) Anaphase – Centromere are towards the equator of cell
(3) Prophase – Initiation of chromosomal condensation
(4) Telophase – Reappearance of ER and nuclear membrane

117. Arrange the following event of meiosis from start to end
(i) Crossing over
(ii) Synapsis formation
(iii) Synaptonemal complex dissolution
(1) (i), (ii), (iii) (2) (ii), (i), (iii)
(3) (iii), (ii), (i) (4) (ii), (iii), (i)

118. In which of the following stage, terminalisation of chiasmata can be seen?
(1) Leptotene (2) Zygotene
(3) Pachytene (4) Diakinesis

119. How many chromosomes will be there at the end of G2 phase if a microspore mother cell has 24 chromosomes in it?
(1) 48 (2) 24
(3) 96 (4) 12

120. Read the statements given below and select the **correct** option.
A. Facilitated diffusion requires the protein carrier and is an active process
B. Sodium potassium pump is an example of active transport
(1) Both statements A and B are correct
(2) Only statement A is correct
(3) Only statement B is correct
(4) Both statements A and B are incorrect

121. If a pressure greater than the atmospheric pressure is applied to a solution
(1) Its water potential will decrease
(2) Its solute potential will decrease
(3) Its water potential will remain unchanged
(4) Its water potential will increase

122. Nitrogen in plants
(1) Is absorbed mainly as N_2
(2) Is essential for pollen germination
(3) Is one of the major constituents of proteins, nucleic acids, vitamins and hormones
(4) Function as a micronutrient

123. Select the **odd** one w.r.t nitrogen fixing bacteria
(1) *Thiobacillus* (2) *Frankia*
(3) *Rhizobium* (4) *Azotobacter*

124. Oxygen evolving complex in plants
(1) Is attached to PS-I
(2) Split the water
(3) Is a part of cyclic photophosphorylation
(4) Is a part of cytochrome b6f complex

125. PEPcase enzyme is
(1) Mainly found in the bundle sheath cells of C_4 plants
(2) Located in mesophyll cells of all C_3 plants
(3) Responsible for the primary carboxylation in C_4 plants
(4) Generally absent in plants having Kranz anatomy

126. Which of the following enzyme is common in TCA cycle and ETS in mitochondria during respiration?
(1) NADH dehydrogenase
(2) Succinate dehydrogenase
(3) Pyruvate kinase
(4) Hexokinase

127. Pyruvic acid + CoA + $NAD^+ \rightarrow$ Acetyl CoA + CO_2 + NADH + H^+
Above reaction is catalysed by
(1) Pyruvate kinase
(2) Pyruvate dehydrogenase
(3) Citrate synthase
(4) Phosphofructokinase

128. Which of the following is **not** a function of gaseous hormone?
(1) It breaks seed and bud dormancy
(2) It stimulates the closure of stomata and increases the tolerance of plants to various kinds of stresses
(3) It is used to initiate flowering and for synchronising fruit-set in pineapples
(4) It promotes rapid internode/petiole elongation in deep water rice plants

129. Plant growth hormone which counteract the apical dominance is
(1) Auxin (2) GA_3
(3) Cytokinin (4) Ethylene

130. Plant which reproduces vegetatively by leaf buds is
(1) Agave (2) *Bryophyllum*
(3) Water hyacinth (4) Ginger

131. Layer present immediate inside the epidermis of anther is
(1) Called tapetum
(2) Responsible for pollen grain nutrition
(3) Called endothecium
(4) Is called middle layer

132. Select the **mismatched** pair w.r.t angiosperms
(1) Female gametophyte – 7 celled and 8 nucleated structure
(2) Megaspore mother cell – A haploid cell
(3) Exine – Outer layer of pollen
(4) Chalaza – Basal part of the ovule

133. Female heterogamety can be seen in all of the given, **except**
(1) Butterfly (2) Moth
(3) Birds (4) Grasshopper

134. Which of the following is a autosomal dominant trait in human?
(1) Sickle cell anaemia (2) Haemophilia
(3) Myotonic dystrophy (4) Phenylketonuria

135. Okazaki fragments during the DNA replication are
(1) Synthesised by the helicase
(2) Synthesised on the leading strand of DNA
(3) Joined by DNA ligase
(4) Composed of RNA

SECTION-B

136. Pusa Komal, a variety of cowpea is resistance to
(1) Bacterial blight
(2) Chilly mosaic virus
(3) White rust
(4) Tobacco mosaic virus

137. *Bacillus thuringiensis* toxin genes
(1) Are derived from Bt cotton
(2) Kill the butterfly caterpillars
(3) Are harmful for the cotton plants
(4) Can be used to kill the fungal and bacterial pathogens of plant

138. How many organisms among given below are regulators?

Snake, Fish, Rat, Human, Frog

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

139. An orchid growing as an epiphyte on a mango branch is an example of
(1) Ectoparasitism (2) Amensalism
(3) Commensalism (4) Mutualism

140. Select the **incorrect** one w.r.t decomposition
(1) It is largely an anaerobic process
(2) Decomposition rate is slower if detritus is rich in lignin and chitin
(3) Decomposition rate is quicker, if detritus is rich in nitrogen and water-soluble substances like sugars
(4) Warm and moist environment favour decomposition

141. Pioneer community during the xerarch succession is
(1) Phytoplankton (2) Zooplankton
(3) Lichen (4) Reed-swamp

142. India even having only 2.4 percent of the world's land area and share global species diversity at
(1) 3 % (2) 34%
(3) 8.1 % (4) 25.2%

143. Which of the following scientist observed that within a region, species richness increased with increasing explored area, but only up to a limit?
(1) Alexander von Humboldt
(2) Robert May
(3) Edward Wilson
(4) Paul Ehrlich

144. Electrostatic precipitator
(1) Is used in the exhaust of a thermal power plant
(2) Is used to remove the gases from the exhaust of vehicles
(3) Remove the particulate matter from the exhaust
(4) Both (1) and (3) are correct

145. Biological oxygen demand
(1) Of a polluted lake is low
(2) Is a measure of oxygen used by aerobic bacteria to degrade organic matter
(3) Is high in a fresh water lake
(4) Decrease when organic matter is high in water body

146. Chrysophytes
(1) Includes diatoms and golden algae
(2) Are mostly saprophytic
(3) Have a protein rich layer called pellicle
(4) Are heterotrophs and live as predators or parasites

147. Pneumatophores
(1) Can be found in maize and sugarcane
(2) Are modified shoots
(3) Help to get oxygen for respiration in plants growing in swampy areas
(4) Are supporting roots

148. Which of the following plant growth factor is derivative of terpenes?
(1) Ethylene (2) Abscisic acid
(3) Indole-3-acetic acid (4) GA_3

149. Which of the following is **incorrect** for male gametophyte in flowering plants?
(1) Exine has sporopollenin
(2) Intine is composed of cellulose and pectin
(3) Vegetative cell is larger than generative cell
(4) Generative cell has large prominent nucleus and rich in food reserve

150. During transcription in eukaryotes, tRNA is synthesized by
(1) RNA polymerase I (2) RNA polymerase II
(3) RNA polymerase III (4) Reverse transcriptase

ZOOLOGY

SECTION-A

151. All of the following functions of the body increases during exercise **except**
(1) Energy demand of the body
(2) Rate of respiration
(3) Heart rate and blood supply
(4) Release of ANF for vasoconstriction

152. Point to point connection for quick coordination is provided by
(1) Endocrine system
(2) Neural system
(3) Effectors of the body
(4) Receptors of the body

153. Match items in column-I with those in column-II and choose the option with the **correct** match.

	Column-I		**Column-II**
a.	Central neural system	(i)	Divided into somatic and autonomic neural system
b.	Peripheral neural system	(ii)	Comprises whole complexes of nerve fibres, ganglia and plexuses.
c.	Autonomic neural system	(iii)	Divided into sympathetic and parasympathetic neural system
d.	Visceral neural system	(iv)	Site of information processing and control.

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

154. GIP inhibits secretion of
(1) Gastric glands (2) Intestinal glands
(3) Gonads (4) Gall bladder

155. Select the **mismatch**
(1) Diabetes mellitus – Ketonuria
(2) Cretinism – Mental retardation
(3) Osteoporosis – Increase in bone mass density
(4) Diabetes insipidus – Polyurea

156. Complete the analogy
Adrenal cortex : Aldosterone :: pituitary gland : _____
(1) Glucocorticoids (2) Adrenaline
(3) ACTH (4) GnRH

157. Which of the following parts of our body have same number of bones?
(1) Cranium and forearms
(2) Cranium and wrist bones of right hand
(3) Cranium and ear ossicles of both ears
(4) Carpals and tarsals

158. Select the **incorrect** match
(1) Saddle joint – Present between carpals
(2) Pivot joint – Present between atlas and axis vertebra
(3) Hinge joint – Humerus and ulna
(4) Ball and socket joint – Acetabulum (Pelvic girdle) and head of femur

159. Read the following statements and choose the option with only **correct** statements.
(a) Myasthenia gravis is an autoimmune disorder affecting neuromuscular junction leading to fatigue.
(b) Muscular dystrophy is a genetic disorder characterised by progressive degeneration of skeletal muscles.
(c) Continuous stimulation of a muscle causes sustained contraction of its muscle fibres called tetany.
(d) Gout is inflammation of joints due to accumulation of urea in joints, tendons and muscles.
(1) (a) and (b) (2) (b) and (c)
(3) (c) and (d) (4) (a) and (d)

160. Descending limb of loop of Henle is __A__ to water whereas ascending limb is __B__ to sodium chloride and __C__ to water.
Choose the option which fill blanks A, B and C correctly.

	A	B	C
(1)	Impermeable	Permeable	Impermeable
(2)	Permeable	Permeable	Impermeable
(3)	Permeable	Impermeable	Permeable
(4)	Impermeable	Permeable	Permeable

161. Choose the **incorrect** match
(1) Ammonotelism – Bony fishes
(2) Uricotelism – Birds
(3) Bowman's capsule – Renal corpuscle
(4) Vasopressin target organ – Urinary bladder

162. Which of the following structure sets the pace of the activities of the heart during normal physiological conditions?
(1) SAN (2) AVN
(3) CNS (4) ANS

163. Rh incompatibility in pregnant mother leads to erythroblastosis fetalis in foetus which can be avoided by administering
(1) Antibiotics in mother before delivery of baby
(2) Rh antigen after delivery of baby
(3) Anti Rh antibodies in baby after delivery
(4) Anti Rh antibodies to the mother immediately after the delivery of first child

164. All of the following conditions are favourable for dissociation of oxyhaemoglobin in tissues except
(1) High level of hydrogen ions
(2) High metabolic rate
(3) Low level of pH of blood
(4) Low pCO_2

165. Match items in column-I with those in column II and choose the option with the **correct** match

	Column-I		Column-II
a.	Total lung capacity	(i)	TLC – IC
b.	Vital capacity	(ii)	IC + ERV
c.	Functional residual capacity	(iii)	VC – IRV
d.	Expiratory capacity	(iv)	IC + FRC

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

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

166. Read the following statements A and B and choose the **correct** option

Statement-A: Ejection of stomach contents through mouth is a reflex action controlled by vomit centre in the medulla oblongata.

Statement-B: The amount of heat liberated from complete combustion of 1 g of food in bomb calorimeter is the physiological value of food.

(1) Both statements A and B are correct

(2) Both statements A and B are incorrect

(3) Only statement A is incorrect

(4) Only statement B is incorrect

167. Choose the **incorrect** statement

(1) Enterokinase is an inactive enzyme which activates trypsinogen into trypsin

(2) Goblet cells are present in mucus membrane of stomach and intestine

(3) Bile juice activates lipases and is responsible for emulsification of lipids

(4) Absorption of water, simple sugars and alcohol takes place in stomach

168. Which of the following biomolecule is devoid of heterocyclic ring?

(1) Adenine (2) Thymine

(3) Ribose (4) Alanine

169. Which of the following biomolecule represents quaternary structure of protein?

(1) Myoglobin (2) Haemoglobin

(3) Keratin (4) Collagen

170. Read following statements carefully and choose the option which states True **(T)** or False **(F)** **correctly** for the given statements.

A. Fat storing connective tissue is called adipose connective tissue.

B. Tyrosine is essential aromatic amino acid represented by letter 'Y'.

C. Right end of glycogen is considered as reducing end.

D. Total number of ends in a cellulose molecule is equal to the total number of branches present at right angle to each other.

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

171. Select the **incorrect** statement

(1) Brush border epithelium is present in inner lining of PCT and small intestine

(2) Mucous membrane is present in gastrointestinal, respiratory and urogenital tracts

(3) Matrix of cartilage is hard and non-pliable

(4) Bone is a specialized connective tissue and is considered as a storage house of calcium.

172. Choose the odd one w.r.t. formed elements

(1) Monocytes (2) Lymphocytes

(3) Macrophages (4) Eosinophils

173. Read the following statements and choose the **correct** one

(1) Forelimbs of birds are modified into wings for clasping the tree branches

(2) Presence of milk producing glands and body hair are unique features of mammals

(3) All marine fishes are cartilaginous fishes in which teeth are modified into placoid scales

(4) Metameric segmentation is feature of animals placed only in phylum annelida

174. Which of the following insect is a gregarious pest?

(1) *Locusta* (2) *Bombyx*

(3) *Aedes* (4) *Laccifer*

175. Match the items in column-I with those in column-II and choose the option with the **correct** match w.r.t. the reproductive system of cockroach

	Column-I		Column-II
a.	Mushroom glands	(i)	9th sternum and tergum along with 10th tergum
b.	Ovaries	(ii)	6th abdominal segment
c.	Spermatheca	(iii)	2nd-6th abdominal segments
d.	Genital pouch in male	(iv)	6th to 7th abdominal segments

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

176. All of the following placental mammals undergo cyclical changes in the activity of ovaries and accessory ducts in females called menstrual cycle **except**
(1) Humans (2) Tigers
(3) Apes (4) Monkeys

177. Read the following statements A and B and choose the **correct** option

Statement-A: In humans, primary spermatocyte is considered as a meiocyte having 22 pairs of autosomes.

Statement-B: Gamete transfer and fertilization are pre-fertilization events in sexual reproduction.

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

178. Choose the **incorrect** match
(1) Insemination – Transfer of sperms in female genital tract
(2) Fertilization – Leading to formation of gametes
(3) Implantation – Attachment of blastocyst with uterine wall
(4) Parturition – Delivery of child

179. Secretion of which of the following structures is essential for maturation of sperms?
(1) Bulbourethral gland (2) Urethra
(3) Glans penis (4) Epididymis

180. Read the following statements and choose the option with **correct** statement(s)
a. Infundibulum leads to a wider part of the oviduct called fimbriae.
b. The cavity of cervix along with uterus is called birth canal.
c. Urethra passes through clitoris in females.
d. Mammary tubules of each lobe of mammary gland join to form a mammary duct.
(1) a and b (2) b and c
(3) a, b, c and d (4) Only d

181. Which of the following is not a function of placenta for developing embryo?
(1) Supply of O_2 and nutrients
(2) Removal of CO_2 from the body of embryo
(3) Removal of waste material produced by embryo
(4) Secretion of relaxin during parturition

182. During parturition, release of oxytocin from maternal pituitary is triggered by
(1) Foetal ejection reflex
(2) Movement of foetus
(3) Contraction in cervical canal
(4) High level of prolactin in mother

183. Population explosion in India is due to increase in
(1) Death rate
(2) MMR
(3) IMR
(4) People in reproducible age

184. Choose the **incorrect** match.
(1) Cervical caps – Barrier method
(2) Lippes loop – Non-medicated IUD
(3) LNG-20 – Copper releasing IUD
(4) Progestasert – Hormone releasing IUD

185. Read following statements A and B and choose the **correct** option.

Statement-A: For synthesis of Humulin, artificially synthesized gene is inserted into a plasmid and then this plasmid is introduced into *Escherichia coli.*

Statement-B: Humulin is extracted from *E.coli* and purified by downstream processing.

(1) Both statements are correct

(2) Both statements are incorrect

(3) Only statement A is correct

(4) Only statement B is correct

SECTION-B

186. α-1-antitrypsin is used for treatment of

(1) Asthma (2) Emphysema

(3) Myocardial infarction (4) Night-blindness

187. Which of the following bacterium is mainly used for production of transgenic plants?

(1) *Mycobacterium tuberculosis*

(2) *Treponema pallidum*

(3) *Haemophilus influenzae*

(4) *Agrobacterium tumefaciens*

188. Complete the analogy

Improved breed of cattle : Jersey : : _____ : Leghorn

(1) Improved breed of sheep

(2) Improved breed of chicken

(3) Improved breed of horse

(4) Improved breed of goat

189. Choose the **odd** one w.r.t. convergent evolution

(1) Flippers of penguins and dolphins

(2) Sweet potato and potato

(3) Wings in insects and birds

(4) Forelimbs of humans and horses

190. Select the **incorrect** match

(1)	Louis Pasteur	–	Disapproved theory of abiogenesis
(2)	Stanley Miller	–	Experimentally proved chemical evolution
(3)	Von Baer	–	Disapproved embryological support proposed by Heckel for evolution
(4)	Alfred Wallace	–	Explained origin of Universe along with Charles Darwin

191. Therapsids were evolved into

(1) Tuataras (2) Crocodiles

(3) Mammals (4) Birds

192. Select an **incorrect** statement for Rhino viruses.

(1) Rhino virus is a causative agent of one of the most infectious human ailments

(2) They infect respiratory system including lungs

(3) Droplets are responsible for transmission of infection from one individual to others

(4) The disease is characterised by nasal congestion and discharge

193. Select the **incorrect** match

(1)	IgG	–	Anamnestic response
(2)	Ringworm	–	*Microsporum*
(3)	Adolescent period	–	Between 12-18 years of age
(4)	Physiological barrier	–	Mucus coating of epithelium

194. Pathological and physiological changes in the living tissue can be accurately detected by MRI which uses

(1) Poor magnetic field and ionizing radiations

(2) Strong magnetic fields and X-rays

(3) Strong magnetic fields and non-ionizing radiations

(4) Poor magnetic field and gamma-rays

195. Match items in column-I with those in column-II and choose the option with the **correct** match.

	Column-I		**Column-II**
A.	Smack	p.	Stimulant of CNS
B.	Hashish	q.	Sedative
C.	Cocaine	r.	Cannabinoids
D.	Morphine	s.	Diacetylmorphine

Options:

	A	**B**	**C**	**D**
(1)	s	r	p	q
(2)	p	q	r	s
(3)	s	r	q	p

(4) s p r q

196. The innermost meninx which is found invested on brain is

(1) Dura mater

(2) Arachnoid

(3) Gray matter

(4) Pia mater

197. Complete the analogy

Urge for eating : Hypothalamus : : Cardiovascular reflexes : _____

(1) Pons

(2) Medulla oblongata

(3) Diencephalon

(4) Midbrain

198. Head of meromyosin along with short arm together constitutes

(1) HMM

(2) LMM

(3) Tail

(4) Thick filament

199. Choose the **incorrect** match

(1) Formed elements – 45% of the blood

(2) Neutrophils – 60%-65% of the blood

(3) Lymphocytes – 20-25% of total WBCs

(4) Eosinophils – 2-3% of total leucocytes

200. Match the items given in column-I with those in column-II and choose the **correct** option

	Column-I		**Column-II**
a.	Squamous epithelium	(i)	Pharynx and buccal cavity
b.	Ciliated epithelium	(ii)	PCT and intestine
c.	Brush border epithelium	(iii)	Endothelium and lung alveoli
d.	Compound epithelium	(iv)	Bronchi and fallopian tube

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

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

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