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MM : 720 **NEET 720-MOCK TEST SERIES for NEET-2022** Time : 3 Hrs.

MOCK TEST - 6

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.

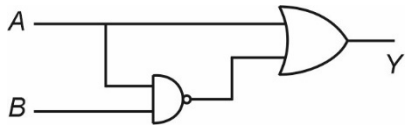
(vii) Rough work must not be done on the Answer sheet and do not use white-fluid or any other rubbing material on the Answer sheet.

PHYSICS

Choose the correct answer:

SECTION-A

1. The output of the combination of gates shown in figure is



(1) $A + \overline{A \cdot B}$

(2) $A \cdot B + \overline{A} \cdot \overline{B}$

(3) $(A + B) \cdot \overline{A \cdot B}$

(4) $(A + B)\left(\overline{A + B}\right)$

2. Relation between the stopping potential V_0 of a metal and the maximum velocity v of the photoelectron is

(1) $V_0 \propto v^2$ (2) $V_0 \propto \frac{1}{v^2}$

(3) $V_0 \propto v$ (4) $V_0 \propto \frac{1}{v}$

3. Photons emitted in transition of electrons from $n = 2$ to $n = 1$ in hydrogen atom is made to fall on a metal surface with work function 1.2 eV. The maximum velocity of photoelectron emitted is nearly equal to

(1) 6×10^5 m/s

(2) 3×10^5 m/s

(3) 2×10^5 m/s

(4) 18×10^5 m/s

4. A man of mass M is on the floor of a lift and lift is moving up with increasing speed with acceleration 'a' then

(a) Normal reaction is more than his true weight

(b) Man appears to be lighter by (a/g) times his true weight

(1) (a) and (b) are correct

(2) (a) and (b) are incorrect

(3) (a) is correct and (b) is incorrect

(4) (a) is incorrect and (b) is correct

5. A boy of weight 20 kg slides down a rope hanging from the branch of tree. If the force of friction against him is 40 N; then acceleration of the boy will be

(1) 8 m/s^2 (2) 4 m/s^2

(3) 6 m/s^2 (4) 2 m/s^2

6. The component of $\vec{A}$ along $\vec{B}$ is 2 times that of the component of $\vec{B}$ along $\vec{A}$. Then $A : B$ is

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

(3) $\sqrt{3} : 2$ (4) 6 : 1

7. The work done by a force $\vec{F} = (-4x^3\hat{i})$ N in displacing a particle from x = 3 m to x = –1 m is

(1) –80 J (2) 80 J

(3) 120 J (4) –120 J

8. When an external force is applied at the centre of mass of a rigid body at rest, then it undergoes

(1) Only translatory motion

(2) Only rotatory motion

(3) Both translatory and rotatory motion

(4) An oscillatory motion

9. A solid cylinder begins to rolls down on 30° incline of length 9 m without slipping. The speed of centre of mass at the bottom of plane is

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

(3) $2\sqrt{g}$ (4) $\sqrt{6g}$

10. A thin rod of mass 6m and length 6l is bent into regular hexagon. The moment of inertia of the hexagon about an axis normal to its plane and through the centre of mass of the system

(1) 11ml^2 (2) 6ml^2

(3) 5ml^2 (4) 8ml^2

11. The time period of a particle performing linear SHM is 18 s. What is the time taken by it to make a displacement equal to half its amplitude from its equilibrium position?

(1) 3 s (2) 2 s

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

12. An electromagnetic wave is travelling to the east. At one instant at a given point its E vector points straight up. What is the direction of its B vector?

(1) North (2) Down

(3) South (4) East

13. What should be the angular speed with which the earth have to rotate about its axis so that a person on equator would weigh $\frac{4}{5}$th as much as on pole? (g = acceleration due to gravity on pole)

(1) $\sqrt{\frac{2g}{5R}}$

(2) $\sqrt{\frac{g}{5R}}$

(3) $\sqrt{\frac{3g}{4R}}$

(4) $\sqrt{\frac{3g}{5R}}$

14. Substance which can be elastically stretched to large value of strain are called

(1) Isomers

(2) Isodiaphers

(3) Plastomers

(4) Elastomers

15. The pressure at the bottom of water tank is 3P, where P is atmospheric pressure. If water is drawn out till the water level decreases by $\frac{2}{5}$th of initial value then pressure at the bottom of the tank will be

(1) $\frac{11P}{5}$ (2) $\frac{4P}{3}$

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

16. When a bimetallic strip made of iron (α_1) and copper (α_2) is heated ($\alpha_2 > \alpha_1$)

(1) Its length does not change

(2) It gets twisted

(3) It bends with iron on concave side

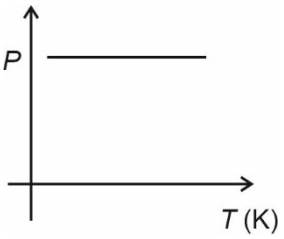
(4) It bends with iron on convex side

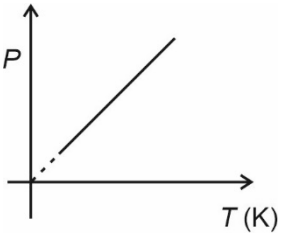
17. Two identical black bodies all at temperature 327°C and 427°C. The ratio of their rates of emission of heat will be

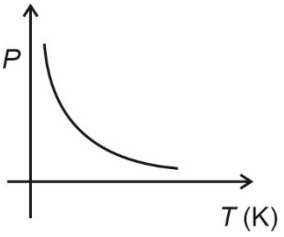
(1) $\frac{64}{81}$ (2) $\frac{343}{444}$

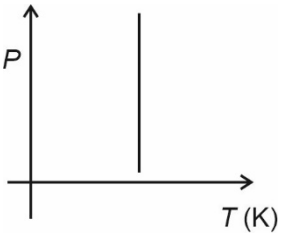
(3) $\frac{2401}{1296}$ (4) $\frac{143}{164}$

18. Which of the following pressure(P)-temperature(T) curve represents an isochoric process for fixed mass of gas?

(1) 

(2) 

(3) 

(4) 

19. If for a gas $\frac{R}{C_v}$ = 0.67, the gas may be made up of molecules which are

(1) Polyatomic (2) Diatomic

(3) Triatomic (4) Monoatomic

20. A transverse wave is represented by $y = A \sin(\omega t - kx)$. For what value of wavelength, the wave velocity is half of maximum particle velocity?

(1) πA (2) $\frac{\pi A}{2}$

(3) $2\pi A$ (4) $\frac{\pi A}{4}$

21. Doppler effect of sound depends on

(1) Intensity of sound wave

(2) Distance between source and listener

(3) Relative velocity between source and listener

(4) Both (1) and (2)

22. A cylindrical tube, closed at one end, has a fundamental frequency f in air. The $\frac{1}{4}$th of the tube is filled with water. The fundamental frequency of the air column is now

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

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

23. Two sound waves with wavelength 5 m and 6 m respectively, each propagate in the gas with velocity 330 m/s. We expect the following number of beats per second

(1) 6 (2) 4

(3) 9 (4) 11

24. The electric field lines due to a positive point charge are

(1) Circular, anticlockwise

(2) Circular, clockwise

(3) Radial, inwards

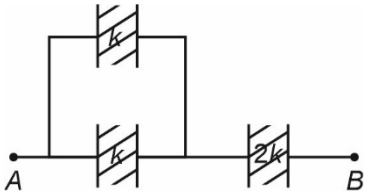
(4) Radial, outwards

25. A sphere of radius R has a uniform distribution of electric charge (q) in its volume. At a distance x from its centre, the electric field (at $x = \frac{R}{2}$) will be

(1) $\frac{q}{4\pi\varepsilon_0 R^2}$ (2) $\frac{q}{8\pi\varepsilon_0 R^2}$

(3) $\frac{3q}{4\pi\varepsilon_0 R^3}$ (4) Zero

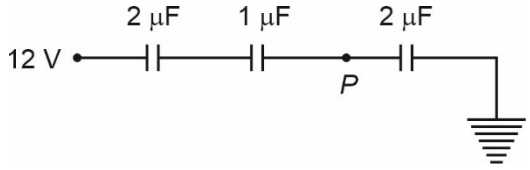
26. In the arrangement shown in the figure, find the equivalent capacitance between A and B (symbol have their usual meaning) (each capacitor has identical dimensions)



(1) $\frac{3A\varepsilon_0 k}{d}$ (2) $\frac{4A\varepsilon_0 k}{d}$

(3) $\frac{A\varepsilon_0 k}{d}$ (4) $\frac{2A\varepsilon_0 k}{d}$

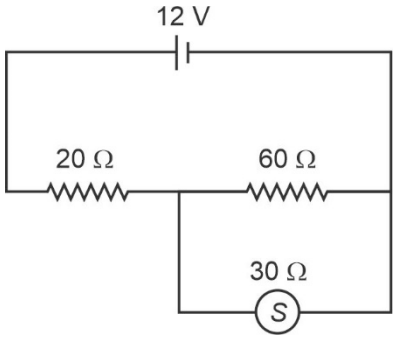
27. In the given circuit, the electric potential of point *P* will be



(1) 6 V (2) 9 V

(3) 3 V (4) 5 V

28. The reading of voltmeter 'S' in the circuit as shown in figure will be



(1) 4 V (2) 6 V

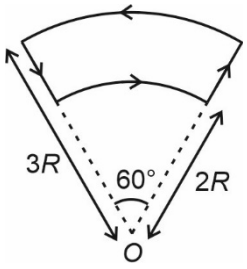
(3) 9 V (4) 10 V

29. A potentiometer consist of a wire of length 2 m and resistance 12 Ω. It is connected to an ideal cell of e.m.f 4 V. The potential difference per unit length of the wire will be

(1) 4 V/m (2) 6 V/m

(3) 1 V/m (4) 2 V/m

30. The figure shows a current loop having two circular arcs joined by two radial lines. The magnetic field at *O* is



(1) $\frac{\mu_0 i}{36R}$ (2) $\frac{\mu_0 i}{24R}$

(3) $\frac{\mu_0 i}{72R}$ (4) $\frac{\mu_0 i}{48R}$

31. If the magnetic susceptibility of a specimen is small and positive, then the specimen is

(1) Diamagnetic (2) Paramagnetic

(3) Ferromagnetic (4) Non-magnetic

32. Flux ϕ (in weber) in a closed-circuited of resistance 12 Ω varies with time according to the equation $\phi = (8t^3 + 6t^2 + 2)$, where *t* is in second. The magnitude of the induced current at $t = 1$ s will be

(1) 1 A

(2) 0.5 A

(3) 3 A

(4) 6 A

33. A 12 ohm resistor and 0.038 henry inductor are connected in series to an *ac* source operating 100 V, 50 Hz. The phase angle between the current and voltage source will be nearly

(1) 30°

(2) 60°

(3) 90°

(4) 45°

34. A plane mirror rotating at an angular velocity 4 radian/s reflects a light beam. The angular velocity of the reflected beam is

(1) 2 rad/s (2) 6 rad/s

(3) 8 rad/s (4) 4 rad/s

35. A convergent lens of power 8 D is used as a simple microscope. The magnification produced by the lens, when the final image is formed at least distance of distinct vision (i.e., 25 cm), is

(1) 1 (2) 5

(3) 9 (4) 3

SECTION-B

36. A concave mirror has a focal length *f*. A real object is placed on axis at distance $\frac{3f}{2}$ in front of its pole, the image produced by the mirror is at distance

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

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

37. Fringe pattern in YDSE is formed due to the phenomenon of

(1) Particle nature of light

(2) Polarisation of light

(3) Interference of light

(4) Rectilinear propagation of light

38. In Young's double slit experiment, the fringe pattern is observed on screen placed at a distance D. The slits are illuminated by light of wavelength λ. The distance from the central point where intensity becomes $\frac{3}{4}$th of the maxima will be

(1) $\frac{\lambda D}{6d}$ (2) $\frac{\lambda D}{d}$

(3) $\frac{\lambda D}{2d}$ (4) $\frac{2\lambda D}{3d}$

39. If the nucleus $^{27}_{13}Al$ has a nuclear radius of about 3.6 fm, then $^{9}_{4}Be$ would have radius as

(1) 3.6 fm (2) $\frac{3.6}{\sqrt[3]{3}}$fm

(3) 2.4 fm (4) $\frac{2.4}{\sqrt{3}}$fm

40. The activity of a radioactive sample is measured as N_0 count per minute at $t = 0$ and $\frac{N_0}{e^2}$ counts per minute at $t = 10$ minutes. The time (in minute) at which the activity reduce to half its initial value is

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

(3) $5\ln 2$ (4) $\ln 4$

41. The mobility of free electrons is greater than that of free holes because they

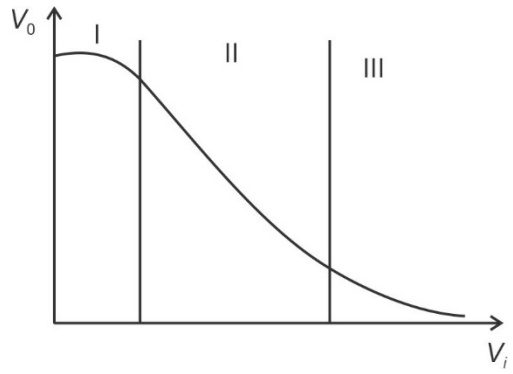
(1) Carry negative charge

(2) Require low energy to continue their motion

(3) Are heavy

(4) Mutually collide less

42. Transfer characteristics between output voltage (V_0) and input voltage (V_i) for a biased transistor in *CE* configuration is as shown in figure. For using transistor as a switch it is used



(1) In region II

(2) In region I

(3) In region III

(4) Both in region (I) and (III)

43. Choose the **incorrect** statement about the strong nuclear force.

(1) It is charge independent

(2) It is a short range force

(3) Within its range it is stronger than electrical interactions

(4) The force of interaction F is proportional to $\frac{1}{r^2}$

44. The error in the measurement of the length of a simple pendulum is 0.2% and the error in the time period is 1%. What is the maximum percentage error in the measurement of physical quantity having the dimensional formula $[LT^{-2}]$?

(1) 4.1% (2) 2.2%

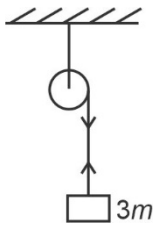
(3) 3% (4) 3.4%

45. A balloon starts from rest and moves vertically upwards with an acceleration $\frac{g}{8}$ m/s^2. A stone falls from the balloon after 8 s from the start. The time taken by the stone to reach the ground will be

(1) 2 s (2) 8 s

(3) 4 s (4) 6 s

46. A block of mass $3m$ is connected with a string which is wound on pulley of mass m and radius R as shown in the figure. If the system is released from rest. Then acceleration of the block will be (consider pulley as uniform disc)



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

(3) $\frac{6g}{7}$ (4) $\frac{g}{3}$

47. The temperature at which a black body ceases to radiate energy

(1) 273 K (2) 0 K

(3) 27 K (4) 300 K

48. Total rotational kinetic energy of two moles of rigid diatomic gas is

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

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

49. A wave is represented by $y = 2\sin\pi(4t - x)$, where x and y are in metres and t is in seconds. The wavelength of the wave is

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

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

50. What is the refractive index of material of plano convex lens. If radius of curvature of the convex surface is 20 cm and focal length of the lens is 30 cm?

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

(2) $\frac{6}{5}$

(3) $\frac{7}{4}$

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

CHEMISTRY

SECTION-A

51. Which of the following pairs of metal is purified by zone refining method?

(1) Ga and Ni (2) Zr and Ti

(3) Ag and Au (4) Si and Ge

52. Select the incorrect statement regarding P_4O_{10} among the following.

(1) It contains 6 P–O–P bonds

(2) It contains 4 P = O bonds

(3) It contains 10 σ bonds

(4) Each phosphorus atom is sp^3 hybridised

53. Which of the following option does not correctly represent the correct order of the property indicated against it?

(1) V > Cr > Mn : Enthalpy of atomisation

(2) Mn > Cr > V : Highest oxidation state

(3) Mn > Cr > V : $E°\ (M^{3+}/M^{2+})$

(4) Cr > Mn > V : 2nd ionization energy

54. Select the incorrect statement for $[Co(en)_3]Cl_3$ among the following.

(1) Homoleptic complex

(2) d^2sp^3 hybridised

(3) Optically active

(4) Paramagnetic in nature

55. Minimum melting point among the following is of

(1) NH_3 (2) PH_3

(3) AsH_3 (4) SbH_3

56. Magnetic moment of Cr^{2+} ion is

(1) 4.9 BM (2) 2.82 BM

(3) 3.87 BM (4) 5.9 BM

57. Highest oxidation state of carbon is in

(1) CO_2 (2) C_3O_2

(3) CO (4) Graphite

58. Most soluble sulphate in water among the following is

(1) $BaSO_4$ (2) $MgSO_4$

(3) $CaSO_4$ (4) $BeSO_4$

59. Volume strength of 1N H_2O_2 is

(1) 2.8 V (2) 5.6 V

(3) 11.2 V (4) 7.8 V

60. Which of the following is not a characteristic of chemical adsorption of a gas on solid surface?

(1) Irreversible in nature

(2) Specific in nature

(3) Monomolecular layer is formed

(4) Zero activation energy

61. The effective number of carbon atoms in a unit cell of diamond is

(1) 6 (2) 8

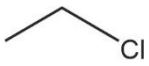
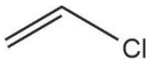
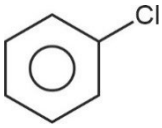
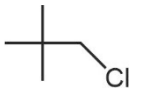
(3) 4 (4) 1

62. Positive sol among the following is

(1) Ag sol (2) As_2S_3 sol

(3) TiO_2 sol (4) Eosin dye

63. S_N1 reactions are favoured in which solvent?
(1) DMSO (2) DMF
(3) Acetone (4) H_2O

64. Among the following Halides, which is most reactive towards S_N2 reaction?
(1) 
(2) 
(3) 
(4) 

65. The correct order of stability of free radicals is
(1) $CH_2 = CH - \dot{C}H_2 > \langle\bigcirc\rangle - \dot{C}H_2 > (CH_3)_3\dot{C}$
(2) $\langle\bigcirc\rangle - \dot{C}H_2 > CH_2 = CH - \dot{C}H_2 > (CH_3)_3\dot{C}$
(3) $(CH_3)_3\dot{C} > \langle\bigcirc\rangle - \dot{C}H_2 > CH_2 = CH - \dot{C}H_2$
(4) $\langle\bigcirc\rangle - \dot{C}H_2 > (CH_3)_3\dot{C} > CH_2 = CH - \dot{C}H_2$

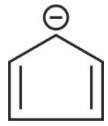
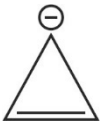
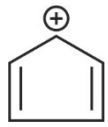
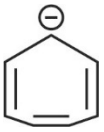
66. Ortho and para hydrogen differ in
(1) Number of electrons
(2) Number of neutrons
(3) Direction of spin of electrons
(4) Direction of spin of nuclei

67. Disproportionation phenomenon is not shown by
(1) ClO^- (2) ClO_4^-
(3) ClO_2^- (4) ClO_3^-

68. Which of the following are path functions?
(a) Heat capacity
(b) Work
(c) Entropy
(1) (a) and (c) only (2) (b) and (c) only
(3) (a) and (b) only (4) (a), (b) and (c)

69. Conjugate base and conjugate acid of HSO_4^- respectively are
(1) SO_3^{2-} and H_2SO_4 (2) H_2SO_4 and SO_4^{2-}
(3) SO_4^{2-} and H_2SO_4 (4) SO_4^{2-} and SO_3^{2-}

70. Change in pH of a solution from 1 to 2, indicates
(1) Decrease in H^+ concentration by 2 times
(2) Decrease in H^+ concentration by 10 times
(3) Increase in H^+ concentration by 10 times
(4) Increase in H^+ concentration by 2 times

71. Aromatic species among the following is
(1) 
(2) 
(3) 
(4) 

72. Select the incorrect statement regarding A.

$$CH_3 - C \equiv CH + H_2O \xrightarrow[333\ K]{Hg^{2+}/H^+} A$$

(1) Forms oxime with NH_2OH
(2) Gives yellow precipitate with I_2/NaOH
(3) Forms H-bonding with water
(4) Reduces Tollen's reagent

73. The IUPAC name of complex $[Pt(NH_3)_4Cl_2]Cl_2$ is
(1) Tetraamminedichloridoplatinate [IV] chloride
(2) Tetraamminedichloridoplatinum [IV] dichloride
(3) Tetraamminedichloridoplatinum [IV] chloride
(4) Tetraamminedichloridoplatinum [II] chloride

74. Which among the following is a carbonate ore?
(1) Corundum
(2) Copper glance
(3) Siderite
(4) Magnetite

75. Due to inert pair effect in 13th group
(1) B shows +3 oxidation state
(2) Tl shows +1 oxidation state
(3) Ga shows +2 oxidation state
(4) Al shows +1 oxidation state

76. The E° values at 25°C for A^+/A, B^{2+}/B, D^{3+}/D and E^+/E are –2.15, –1.75, +0.15 and +0.21 volt respectively. Which of the following is the strongest oxidising agent?
(1) E^+ (2) B^{2+}
(3) D^{3+} (4) A^+

77. If on doubling the volume of reaction vessel, the rate of gaseous reaction remains same then the order of the reaction is

(1) Zero (2) One

(3) Two (4) Three

78. vant Hoff's factor (i) for acetic acid in benzene is (assuming 30% dimerization of acetic acid in benzene)

(1) 0.30 (2) 0.50

(3) 0.71 (4) 0.85

79. The difference in heat of reaction (in J) at constant pressure and at constant volume at 25°C for the given reaction will be

$$C_8H_{18}(g)+\frac{25}{2}O_2(g)\rightarrow 8CO_2(g)+9H_2O(l)$$

(1) $-\frac{11}{2}\times 8.314\times 298$ (2) $-\frac{5}{2}\times 2\times 298$

(3) $-\frac{9}{2}\times 0.0821\times 298$ (4) $-\frac{11}{2}\times 2\times 298$

80. Among the given gases, the value of van der Waal's constant 'a' is maximum for

(1) H_2 (2) Ne

(3) O_2 (4) He

81. The density of N_2 gas at 0.821 atmospheric pressure and 7°C is

(1) 10 g L^{-1} (2) 0.1 g L^{-1}

(3) 1 g L^{-1} (4) 0.01 g L^{-1}

82. Which has maximum number of atoms?

(1) 16 g of O_3 (2) 44 g of CO_2

(3) 1 g of H_2 (4) 23 g of NO_2

83. Which of the following set of quantum numbers represents the highest energy orbital in a multi electron atom?

	n	l	m	s
(1)	3	0	0	$-\frac{1}{2}$
(2)	4	0	0	$+\frac{1}{2}$
(3)	3	1	–1	$+\frac{1}{2}$
(4)	4	1	0	$-\frac{1}{2}$

84. The incorrect statement among the following is

(1) Classical smog occurs in warm, dry and sunny climate

(2) Sodium arsenite is used as herbicide

(3) Fuel obtain from plastic waste contains no lead

(4) Tetrachloroethene was earlier used as solvent for dry cleaning

85. Highest dipole moment among the following is of

(1) NF_3 (2) HI

(3) H_2O (4) CCl_4

SECTION-B

86. Which among the following contains only two pi bonds?

(1) B_2 (2) N_2

(3) O_2 (4) C_2

87. Highest positive electron gain enthalpy is of

(1) He (2) Ne

(3) Ar (4) Xe

88. Amphoteric oxide among the following is

(1) Cl_2O_7 (2) As_2O_3

(3) N_2O (4) Na_2O

89. Most basic compound in aqueous medium among the following is

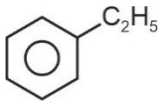
(1) $C_2H_5NH_2$ (2) $(C_2H_5)_2NH$

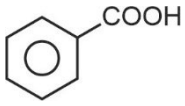
(3) $(C_2H_5)_3N$ (4) NH_3

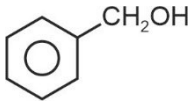
90. Consider the following reaction sequence

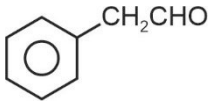
$$CH_3COOH\xrightarrow{PCl_5}A\xrightarrow[\text{anhy. } AlCl_3]{C_6H_6}B\xrightarrow[\text{Conc. HCl}]{Zn-Hg}C.$$

C is

(1) 

(2) 

(3) 

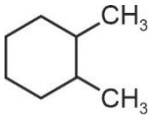
(4) 

91. Phenol and benzylalcohol can be distinguished by

(1) $FeCl_3$ (2) $NaHCO_3$

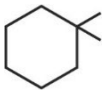
(3) Na (4) HCl

92. Geometrical isomerism is shown by

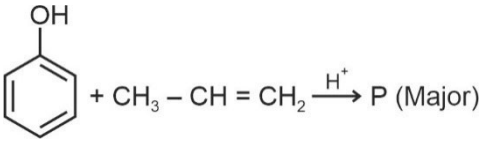
(1) 

(2) $(CH_3)_2C = N - OH$

(3) $CH_3 - CH = CH_2$

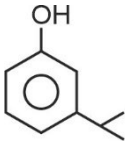
(4) 

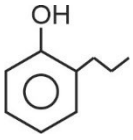
93. In the given reaction



The product P is

(1) 

(2) 

(3) 

(4) 

94. Most reactive compound towards nucleophilic addition among the following is

(1) CH_3CHO (2) PhCHO

(3) $PhCOCH_3$ (4) HCHO

95. Vulcanisation of rubber involves heating a mixture of raw rubber with

(1) Nitrogen (2) Phosphorus

(3) Sulphur (4) Chlorine

96. Identify the crystal system having edge lengths a = b = c and inter-axial angles $\alpha = \beta = \gamma \neq 90°$

(1) Rhombohedral (2) Tetragonal

(3) Triclinic (4) Monoclinic

97. Positive deviation is observed in case of

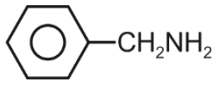
(1) $HNO_3 + H_2O$

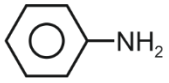
(2) $CHCl_3 + (C_2H_5)_2O$

(3) $CH_3COCH_3 + C_6H_5NH_2$

(4) $C_6H_6 + CH_3COCH_3$

98. Which of the following amine does not react with Hinsberg reagent?

(1)  (2) $CH_3 - NH - CH_3$

(3) $(CH_3)_3N$ (4) 

99. Incorrect option among the following is

	Metal	Characteristic colour to an oxidizing flame
(1)	Li	Crimson red
(2)	Na	Yellow
(3)	K	Violet
(4)	Cs	Green

100. The molarity of 1% (w/w) HCl solution having density 0.365 g/ml is

(1) 0.01 M (2) 0.1 M

(3) 1 M (4) 0.001 M

BOTANY

SECTION-A

101. During interphase DNA replication occurs in

(1) G_1 phase

(2) G_2 phase

(3) S phase

(4) G_0 phase

102. At the end of meiosis II

(1) Four diploid cells are formed

(2) Four haploid cells are formed

(3) Pairing of homologous chromosomes occurs

(4) Karyokinesis follows cytokinesis resulting in the formation of tetrad of cells

103. According to Singer and Nicolson model of cell membrane
(1) The quasi-fluid nature of lipid enables lateral movement of protein within over all bilayer
(2) The quasi-fluid nature of protein enables lateral movement of lipid
(3) Peripheral proteins are totally buried in the phospholipid bilayer
(4) Tunnel proteins lie on the surface of cell membrane

104. In humans, some chromosomes have
(1) Light staining secondary constriction at a constant location
(2) Dark staining secondary constriction at a constant location
(3) Large number of small fragments called satellite
(4) Non-staining secondary constriction at a constant location

105. All of the following exhibit an increase in girth (diameter), **except**
(1) Stems of gymnosperms
(2) Roots of gymnosperms
(3) Stems of monocot
(4) Stems and roots of dicot

106. Which of the given phloem is absent in monocots?
(1) Protophloem
(2) Metaphloem
(3) Secondary phloem
(4) Primary phloem

107. Which of the following symbols of floral formula shows polyandrous and epipetalous condition?
(1) $\overset{\frown}{C_{(5)}}A_5$ (2) $\overset{\frown}{P_{(3+3)}}A_{(3+3)}$
(3) $\overset{\frown}{P_{(3+3)}}A_{3+3}$ (4) $\overset{\frown}{C_5}A_{(3)}$

108. Choose the **correct** match
(1) Marginal placentation – *Argemone*, pea
(2) Axile placentation – Lemon
(3) Parietal placentation – Pea
(4) Free central placentation – Tomato

109. Identify the **correct** example of adventitious root which gets swollen and store food.
(1) Carrot (2) Sweet potato
(3) Turnip (4) Potato

110. Male and female sex organs are present on separate plant bodies in
(1) *Sphagnum* (2) *Chara*
(3) *Funaria* (4) *Marchantia*

111. Read the following statements and choose the option which is **true** for them.
a. *Dryopteris* is horsetail
b. *Selaginella* is heterosporous
c. *Salvinia* is aquatic plant
(1) b and c are correct (2) Only a is correct
(3) Only c is correct (4) a and b are correct

112. Identify the **correctly** matched pair
(1) Haplontic life cycle – Only gamete represents haploid phase
(2) Diplontic life cycle – Haploid phase is highly reduced
(3) Haplo-diplontic life cycle – Only haploid generation exists
(4) Haplontic life cycle – *Fucus*

113. Archegonia is female sex organs in all, **except**
(1) *Pinus* (2) *Adiantum*
(3) *Polysiphonia* (4) *Funaria*

114. In the five kingdom classification of Whittaker there is no mention of all of the following, **except**
(1) Viruses
(2) Viroids
(3) Autotrophic prokaryotes
(4) Prions

115. Select the **wrong** statement
(1) Viruses are acellular structures
(2) Viruses are not considered truly living
(3) Viruses have an inert crystalline structure outside the living cell
(4) Viruses do not pass through bacteria-proof filters

116. In which of the following fungi/members, dikaryophase is **not** formed?
(1) Phycomycetes (2) Ascomycetes
(3) Basidiomycetes (4) Mushrooms

117. Linnaeus two kingdom system of classification distinguished between the
(1) Eukaryotes and prokaryotes
(2) Plants and animals
(3) Unicellular & multicellular organisms
(4) Photosynthetic and chemosynthetic organisms

118. During fermentation in yeast, two sets of reactions occur from pyruvate, one is catalysed by __A__ and next is catalysed by __B__ to form ethanol.
Select the **correct** option for A and B.
(1) A = Invertase;
B = Alcohol dehydrogenase
(2) A = Pyruvate decarboxylase;
B = Alcohol dehydrogenase
(3) A = Alcohol dehydrogenase;
B = Pyruvate kinase
(4) A = Zymase; B = Hexokinase

119. The respiratory quotient of $C_{51}H_{98}O_6$ (tripalmitin) is
(1) 1.4 (2) 1
(3) 0.9 (4) 0.7

120. Phellem is formed by phellogen through
(1) Differentiation (2) Dedifferentiation
(3) Redifferentiation (4) Plasticity

121. In flowering plants endosperms are
(1) Haploid or diploid (2) Haploid only
(3) Diploid only (4) Triploid

122. Match the following columns and select the **correct** option.

	Column I		**Column II**
	(Reproduction by asexual means)		**(Example)**
a.	True regeneration	(i)	*Planaria*
b.	Fragmentation	(ii)	Filamentous algae
c.	Budding	(iii)	Yeast
d.	Asexual spores	(iv)	Fungi

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

123. The taxonomical aid used for identification of plants and animals based on the similarities and dissimilarities is
(1) Catalogues (2) Key
(3) Museum (4) Herbarium

124. Which two important amides found in the plants are structural part of proteins?
(1) Glutamate and ureides
(2) Glycine and serine
(3) Glutamine and asparagine
(4) Asparagine and arginine

125. Transport of water and minerals in xylem is essentially
(1) Multidirectional
(2) Bidirectional
(3) Unidirectional
(4) Bidirectional but occasionally multidirectional

126. Two chambers are separated by selectively permeable membrane. If one chamber (X) has a ψ_w of –2000 kPa and the other (Y) has ψ_w –1000 kPa. The direction of the movement of water will be:
(1) From lower ψ_w to higher ψ_w
(2) From X to Y chamber
(3) From the chamber with –1000 kPa ψ_w to – 2000 kPa ψ_w
(4) In both directions $X \rightleftarrows Y$

127. In companion cells, during translocation, organic nutrient is loaded mainly in the form of
(1) Sucrose
(2) Glucose
(3) Starch
(4) Glucose and fructose

128. Which one of the following conditions in human beings is correctly matched with its chromosome complement?
(1) Turner's syndrome – 44 + XXX
(2) Klinefelter's syndrome – 44 + XO
(3) Down's syndrome – 45 + XY
(4) Cystic fibrosis – 44 + XXY

129. Which of the following is a structural gene of *lac*-operon?
(1) Regulator gene (2) Operator gene
(3) Promoter gene (4) z gene

130. During splicing of hnRNA, introns are removed by the help of
(1) The RNA polymerase II
(2) An SnRNA and protein complex
(3) Peptidyl transferase
(4) An RNA ligase

131. Which of the following statements is **not** correct regarding Blackman's law of limiting factors?
(1) It comes into effect, when several factors affect the biochemical process
(2) Green plants may not photosynthesise even in the presence of optimal light and CO_2 if the temperature is very low
(3) Temperature is the major limiting factor of photosynthesis
(4) The rate of a biochemical process is determined by the factor which is nearest to its minimal value

132. Identify the enzyme which catalyses the first step of photorespiration in C_3-plants.
(1) PEP carboxylase (2) RuBisCO
(3) NADP reductase (4) Hexokinase

133. In plants, growth can be measured by using all of the following parameters, **except**
(1) Increase in surface area
(2) Increase in cell number
(3) Increase in respiration rate
(4) Increase in volume

134. Which PGR was isolated from tips of coleoptiles of oat seedling by F.W. Went?
(1) Auxin (2) Cytokinin
(3) Gibberellin (4) Abscisic acid

135. Among the following features of ethylene, how many are antagonistic to abscisic acid?
a. Horizontal growth of seedlings
b. Promotes abscission of plant organs
c. Effective in fruit ripening
d. Breaking seed and bud dormancy
e. Initiates germination in some seeds
(1) One (2) Two
(3) Three (4) Four

SECTION-B

136. No correlation is observed between critical photoperiod and induction of flowering response in
(1) Long day plant
(2) Short day plant
(3) Day neutral plant
(4) Long-short day plant

137. What percent of particulate matter present in the exhaust of thermal power plant, can be removed by electrostatic precipitator?
(1) Less than 2.5% (2) About 25%
(3) Over 99% (4) About 50%

138. The IUCN Red List (2004) documents the extinction of 784 species in the last
(1) 100 years (2) 500 years
(3) 1000 years (4) 20 years

139. The detritus food chain
(1) Begins with dead organic matter
(2) Always ends with parasites
(3) Is the major conduit for energy flow in aquatic ecosystem
(4) Is not connected with GFC

140. Among four basic processes, which contribute more significantly to population growth if a habitat is colonised newly?
(1) Natality (2) Mortality
(3) Emigration (4) Immigration

141. Match the columns and choose the **correct** option.

Column I (Crop)	**Column II (Variety resistant to diseases)**
a. Cauliflower	(i) Himgiri
b. Cowpea	(ii) Pusa shubhra
c. Chilli	(iii) Pusa komal
d. Wheat	(iv) Pusa sadabahar

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

142. The *Trichoderma polysporum* produces
(1) Statins (2) Cyclosporin A
(3) Citric acid (4) Lactic acid

143. Rice
(1) Is a monocarpic plant
(2) Plant flowers once every year
(3) Is a biennial plant
(4) Has life span of 1000 years

144. The body of ovule fuses with funicle in the region called
(1) Chalaza (2) Hilum
(3) Micropyle (4) Nucellus

145. In Mendelian genetics, the formation of different types of gametes and their genotypes, number of zygotes formed and phenotypes and genotypes of progenies can be easily identified by using
(1) Binomial expression
(2) Hardy-Weinberg principle
(3) Punnett square
(4) The equation dN/dt = rN

146. Select the **correctly** printed scientific name of brinjal.
(1) *Solanum Melongena*
(2) Solanum melongena
(3) *Solanum melongena*
(4) Solanum melongena

147. Find **odd** one w.r.t. modification of stem
(1) Banana
(2) *Pistia*
(3) Ginger
(4) Turmeric

148. Which of the following enzymes are used in somatic hybridisation of two cells of different plants?
(1) Chitinase and cellulase
(2) Cellulase and pectinase
(3) ATP synthase and lipase
(4) Lipase, pectinase and protease

149. Autotrophic microbes which can fix atmospheric nitrogen are all, **except**
(1) *Anabaena*
(2) *Nostoc*
(3) *Oscillatoria*
(4) *Spirulina*

150. The staminate and pistillate flowers are found on separate plant body in
(1) Date palm (2) Cucurbits
(3) Maize (4) Coconut

ZOOLOGY

SECTION-A

151. Which one of the following animals is **not** correctly matched with one characteristic and taxon?

	Animal	Characteristic	Taxon
(1)	*Chiton*	Muscular foot	Mollusca
(2)	*Fasciola*	Sexes are not separate	Platyhelminthes
(3)	*Antedon*	Excretion through specialised excretory tube	Echinodermata
(4)	*Aurelia*	Metagenesis is absent	Coelenterata

152. Select the **incorrect** statement w.r.t. animal illustrated.

(1) Bilaterally symmetrical, triploblastic and segmented animal
(2) It possess parapodia which help in swimming
(3) It contains double, hollow, dorsal nerve cord
(4) It is an aquatic dioecious animal

153. How many animals given below in box, exhibit metamorphosis in their life cycle?

Petromyzon, Ichthyophis, Chameleon, Pavo, Ascidia, Branchiostoma

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

154. Choose the **incorrect** match.
(1) *Vipera* – Three chambered heart
(2) *Neophron* – Air sacs supplement the respiration
(3) *Hemidactylus* – Bony endoskeleton
(4) *Pteropus* – Air bladder is present

155. Read the following statements w.r.t. cockroach and choose the **correct** answer.

A. 10 pairs spiracles are present on dorsal side of the body

B. One pair walking legs arise from each thoracic and abdominal segment

C. Mesothoracic wings are also called elytra

(1) A and B are correct

(2) B and C are correct

(3) A and C are correct

(4) A and B are incorrect

156. Malpighian tubules absorb nitrogenous waste products from ___A___ and convert them into ___B___.

Choose the option that **correctly** fill the blanks A and B.

	A	**B**
(1)	Visceral organ	Urea
(2)	Haemolymph	Uric acid
(3)	Visceral organ	Ammonia
(4)	Haemolymph	Guanine

157. Select the **incorrect** difference between bone and cartilage in humans.

		Bone	**Cartilage**
(1)	Matrix	Hard and non-pliable	Solid and pliable
(2)	Lacunae contains	Osteocytes	Chondrocytes
(3)	Function	Serve weight-bearing function	Resist compression
(4)	Ground substance	Rich in collagen fiber	Rich in calcium salts

158. Gap junctions are present in all **except**

(1) Epithelial tissue

(2) Striated involuntary muscles

(3) Skeletal muscles

(4) Smooth muscle

159. Cells involved in the formation of Blood-Brain barrier are

(1) Neurons (2) Schwann cells

(3) Astrocytes (4) Oligodendrocytes

160. Identify the co-factor for enzyme peroxidase.

(1) Zn^{+2} (2) Cu^{+2}

(3) Haem (4) NADP

161 Which of the following is **incorrect** w.r.t. nucleosides?

(1) Cytosine (2) Guanosine

(3) Adenosine (4) Uridine

162. Complete the analogy w.r.t. percentage of gases transported by RBCs.

O_2 : 97% : : CO_2 _____

(1) 3%

(2) 70%

(3) 20-25%

(4) 7%

163. The alveolar ventilation rate in a healthy person is about 4200 ml/min and tidal volume is 500 ml. Calculate the amount of dead air space, if breathing rate is12 per min.

(1) 500 ml (2) 350 ml

(3) 150 ml (4) 250 ml

164. How many teeth in upper jaw come only once in life?

(1) 12 (2) 20

(3) 6 (4) 32

165. Enterokinase is a/an

(1) Exopeptidase

(2) Endopeptidase

(3) Dipeptidase

(4) Aminopeptidase

166. Pancreatic juice differs from gastric juice in

(1) Presence of enzyme lipase

(2) Presence of enzyme nucleotidase

(3) That it is secreted from zymogenic cells

(4) Presence of starch digesting enzymes

167. The animals which use moist cuticle for exchange of gases are included in phylum

(1) Annelida (2) Arthropoda

(3) Coelenterata (4) Mollusca

168. A person with blood group B can donate blood to people with blood groups

(1) A and O

(2) B and AB

(3) AB and A

(4) O and B

169. AV valves remain close and semilunar valves open
(1) Before isovolumetric relaxation
(2) During joint diastole
(3) During atrial systole
(4) Before isovolumetric contraction

170. Choose the **odd** one w.r.t. structure present in reproductive system of female cockroach
(1) Collaterial glands (2) Spermatheca
(3) Vagina (4) Phallic gland

171. Heart muscles are suddenly damaged by an inadequate blood supply in
(1) CAD (2) Angina
(3) Heart failure (4) Heart attack

172. Cortical nephron differs from juxtamedullary nephron in all of the following **except**
(1) Number
(2) Absence of vasa recta
(3) Presence of peritubular capillary network
(4) Length of loop of Henle

173. The osmolarity of the glomerular filtrate in distal convoluted tubule of nephron is around
(1) 600 mOsmol L^{-1} (2) 200 mOsmol L^{-1}
(3) 1200 mOsmol L^{-1} (4) 1000 mOsmol L^{-1}

174. Number of bones in axial skeleton is
(1) Five times the number of facial bones
(2) Two times the number of limb bones
(3) Less than the number of appendicular skeleton bones
(4) Half the number of total human bones

175. Joint present between bones tibia and femur is also present in between
(1) Radius and ulna
(2) Carpal and metacarpal of thumb
(3) Humerus and ulna
(4) Femur and pelvic girdle

176. Progressive degeneration of skeletal muscle due to genetic disorder is called
(1) Myasthenia gravis
(2) Tetany
(3) Osteoporosis
(4) Muscular dystrophy

177. Which sense organ is related with maintenance of body position in response to rotational acceleration?
(1) Crista ampullaris
(2) Otolith organ
(3) Organ of corti
(4) Macula of utricle and saccule

178. Iodopsin photopigments are present in a which are associated with b vision.
Choose the option that **correctly** fills the blank a and b.
(1) Cones, Scotopic
(2) Rods, Twilight
(3) Cones, Colour
(4) Rods, Photopic

179. In knee jerk reflex action, the efferent pathway emerges from
(1) Motor end plate
(2) White matter of spinal cord
(3) Grey matter of spinal cord
(4) Dorsal root ganglia

180. How many hormones given below are secreted from adenohypophysis?

ADH, PRL, TSH, ACTH, MSH, GnRH

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

181. Synthesis and release of FSH from anterior pituitary is inhibited by all **except**
(1) Inhibin from sertoli cells
(2) Estrogen and progesterone
(3) Inhibin from granulosa cells
(4) Relaxin from developing follicles

182. In females, secondary oocyte completes meiosis II during
(1) Follicular phase
(2) Ovulation
(3) Fusion of sperm with ovum
(4) After fertilisation

183. GIFT involves
(1) *In vitro* fertilisation
(2) Transfer of embryo upto eight blastomeres stage into fallopian tube
(3) Transfer of gametes in fallopian tube
(4) Transfer of semen into uterus

184. Match column I with column II and choose the **correct** option.

Column-I		Column-II	
a.	Saheli	(i)	Suppress sperm motility
b.	LNG-20	(ii)	Hormonal IUD
c.	Multiload 375	(iii)	Centchroman
d.	Implant	(iv)	Anovulation

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

185. Select the **correct** statement for *Homo erectus*.
(1) Common ancestor of apes and humans
(2) First erect man
(3) Also called handy man
(4) First man to use fire

SECTION-B

186. In a population of 5000 individuals, 800 are aa type. What will be the number of Aa type individuals?
(1) Two times of AA type of individuals
(2) Three times of aa type of individuals
(3) Half of the AA type of individuals
(4) 1800 in numbers

187. PMNL are one of the main components of
(1) Acquired immunity
(2) Cellular barrier of innate immunity
(3) Humoral immunity
(4) Cytokine barrier of innate immunity

188. Choose the **odd** one w.r.t. mode of transmission of disease.
(1) Pneumonia (2) Common cold
(3) Amoebiasis (4) Tuberculosis

189. A drug, which causes hallucinations at high dosage, is obtained from
(1) *Erythroxylum coca*
(2) *Papaver somniferum*
(3) *Triticum*
(4) *Rauwolfia serpentina*

190. Pebrine disease is associated with
(1) *Apis* (2) Silk worm
(3) Poultry (4) Cattles

191. Gene amplification using primers can be done by
(1) Gene gun
(2) Gene cloning
(3) Microinjection
(4) Polymerase chain reaction

192. In cloning vector pBR322 the recognition site *Sal* I is present in
(1) Ampicillin resistance gene
(2) Tetracycline resistance gene
(3) Neomycin resistance gene
(4) *Lac* Z gene

193. Which of the following transgenic plant is used for the synthesis of hirudin?
(1) *Agrobacterium*
(2) *Brassica*
(3) Daffodil
(4) *Oryza*

194. Choose the **incorrect** statement.
(1) α-1 antitrypsin obtained from transgenic animals is used to treat emphysema
(2) The first gene therapy was done in 1990 for a four years old baby
(3) Golden rice is rich in vitamin A
(4) *cryIAb* gene is introduced in cotton plant to develop resistance against cotton bollworm

195. First hormone produced by recombinant DNA technology is
(1) Growth hormone (2) Insulin
(3) Estrogen (4) Erythropoietin

196. Which of the following bone is not a part of appendicular skeleton?
(1) Patella (2) Scapulla
(3) Atlas (4) Tibia

197. Pest resistant Bt cotton crop has been developed by transferring a gene from
(1) *Agrobacterium*
(2) *Meloidogyne incognita*
(3) *Bacillus thuringiensis*
(4) *E.coli*

198. The fibroblasts present in the loose connective tissue produce fibres made up of

(1) Fibrin

(2) Collagen

(3) Chitin

(4) Keratin

199. Primary oocyte grows in size and completed meiosis 1st

(1) In secondary follicle

(2) In Graafian follicle

(3) During follicular phase of menstrual cycle

(4) During secretory phase of menstrual cycle

200. Read the following statements and choose the option which states them as true (T) or false (F)

a. Glomerular filtrate has almost the same composition as that of plasma except the proteins

b. Glucose is completely reabsorbed in PCT part of nephron

c. ADH acts on PCT

	a	b	c
(1)	T	T	T
(2)	T	T	F
(3)	F	T	T
(4)	T	F	F

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