Dated : 07-04-2023

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Test Series [Option-1] for NEET-2023

MM : 720 **Time : 3 hrs. 20 min.**

Mock Test

PHYSICS : SECTION-A

All questions are compulsory in section A

1. If $|\vec{A}-\vec{B}| = |\vec{A}| = |\vec{B}|$, the angle between $\vec{A}$ and $\vec{B}$ is

   (1) 60° (2) 0°
   (3) 120° (4) 90°

2. Two pendulums of length 1m and 9m are in phase at the mean position at a certain instant of time. If T is the time period of shorter pendulum, the minimum time after which they will again be in phase is

   (1) 1.5 T (2) 1.25 T
   (3) 1.33 T (4) 1.75 T

3. The specific heat of hydrogen gas at constant pressure is $C_P = 3.4 \times 10^3$ cal/kg °C and at constant volume is $C_V = 2.4 \times 10^3$ cal/kg °C. If one kilogram hydrogen gas is heated from 10°C to 20°C at constant pressure, the work done by the gas is

   (1) 10^5 cal (2) 10^4 cal
   (3) 10^3 cal (4) 5×10^3 cal

4. The atmospheric pressure is measured with a barometer having a vernier scale whose 20 divisions coincide with 19 divisions of main scale. Each division of the main scale is equal to 0.5 mm. The atmospheric pressure (in cm of Hg) correctly reported with due regard to significant figures, is

   (1) 75.0050 (2) 75.005
   (3) 75.00 (4) 75.50

5. The half-life period of a radioactive element X is same as the mean-life time of another radioactive element Y. Initially both of them have the same number of atoms. Then

   (1) X and Y have the same decay rate initially
   (2) X and Y decay at the same rate always
   (3) Y will decay at a faster rate than X
   (4) X will decay at a faster rate than Y

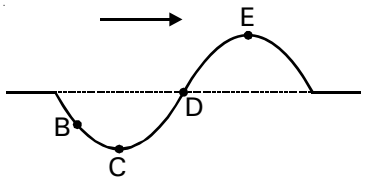
6. 

   Figure shows a transverse sinusoidal progressive wave on a string. Then a small segment at

   (1) C or E has maximum potential energy
   (2) C or E has constant total energy
   (3) D has minimum potential energy
   (4) D has maximum kinetic & potential energy

7. If energy 'E', velocity 'V' and time 'T' are taken as fundamental units, then the dimensional formula for surface tension is

   (1) $[EV^{-2}T^{-2}]$ (2) $[E^{-2}VT^{-2}]$
   (3) $[E^{-2}V^{-2}T]$ (4) $[E^{-2}V^{-2}T^2]$

8. What is the work done in rotating a magnetic dipole of moment 4 Am^2 in a uniform magnetic field of 0.4 T from a position of 37° to zero potential energy position?

   (1) 0.96 J (2) – 0.96 J
   (3) –1.28 J (4) 1.28 J

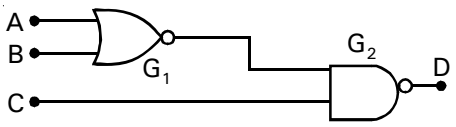
9. A cricket player throws a 100 gram ball which strikes the bat of the batsman normally at a speed of 72 km/h and the ball returns with a speed of 108 km/h. What is the magnitude of impulse acting on the ball?
(1) 6 kg m/s (2) 5 kg m/s
(3) 4 kg m/s (4) 7.2 kg m/s

10. At what height from the ground will the value of 'g' be the same as that in 10 km deep mine below the surface of earth
(1) 20 km (2) 10 km
(3) 15 km (4) 5 km

11. A jet airplane travelling at speed of 1080 km h^{-1} ejects its products of combustion at the speed of 1 km/s relative to the jet plane. What is speed of exhaust gases wrt an observer on the ground?
(1) 500 m/s (2) 1 km/s
(3) 1300 m/s (4) 700 m/s

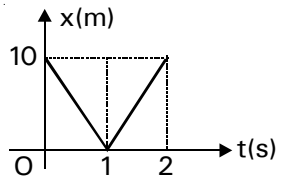
12. A sinusoidal voltage of frequency 50 Hz is applied to a series LCR circuit in which $R = 5\,\Omega$, L = 10 mH and C = 500 μF. Impedance of the circuit is about
(1) 6 Ω (2) 7 Ω
(3) 8 Ω (4) 10 Ω

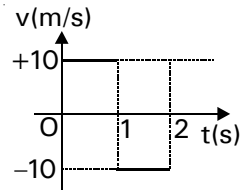
13. A projectile of mass 150 g is thrown vertically upwards with a speed 50 m/s. What is instantaneous power developed by gravity at t = 2 s?
(1) −100 W (2) −75 W
(3) 50 W (4) −45 W

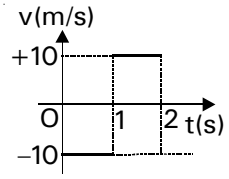
14. 

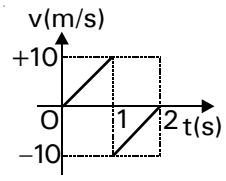
For given combination of gates, if the logic states of inputs A, B, C are as follows A = B = C = 0 and A = B = 0, C = 1 then logic states of output D are
(1) 0, 0 (2) 0, 1
(3) 1, 0 (4) 1, 1

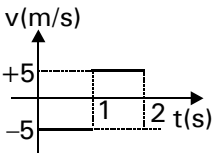
15. In a resonance pipe the first and second resonances are obtained at depths 15.7 cm and 48.2 cm respectively. What is the end correction?
(1) 1.1 cm (2) 0.55 cm
(3) 0.35 cm (4) zero

16. The displacement-time graph of a moving particle is shown in figure.


The corresponding velocity-time graph is
(1) 

(2) 

(3) 

(4) 

17. A gas mixture contains 2 moles of helium and 4 moles of hydrogen at T kelvin. The total internal energy of the mixture (Neglect vibrational modes)
(1) 8 RT (2) 11 RT
(3) 13 RT (4) 25 RT

18. In Young's double slit experiment the distance between slits is 1×10^{-4} m. The adjacent maxima of interference pattern subtends an angle of 16.2 minutes at the midpoint between slits. The wavelength of light used in the experiment is nearly
(1) 5320 Å (2) 6460 Å
(3) 4710 Å (4) 4430 Å

19. Four point masses are placed in a plane so that their centre of mass is at (1,1). Three of them are of mass 'm' each and are placed at (0,0),(2,0) and (0,2) respectively. The fourth of mass 2m is displaced from it's initial position such that centre of mass of the system now moves to (2,1). Then displacement of the fourth point mass is

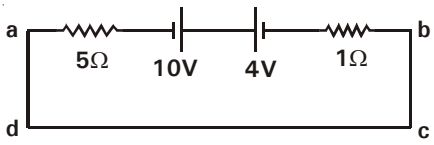
(1) 5 units (2) $\frac{5}{2}$ units

(3) 3 units (4) 2 units

20. The work function of caesium metal is 2 eV. When light of frequency 8×10^{14} Hz is incident on the metal surface, photoemission of electrons occurs. Maximum speed of emitted photoelectrons is

(1) 372 km/s (2) 432 km/s
(3) 535 km/s (4) 680 km/s

21.



The current in the circuit is

(1) 2.33 A from a to d (2) 2.33 A from b to c
(3) 1 A from a to d (4) 1 A from b to c

22. A copper disc of radius 0.2 m is rotated about its centre with 10 revolutions per second in a uniform magnetic field of 0.3 T with its plane perpendicular to the field. The e.m.f. induced across the radius of disc is

(1) $\frac{9\pi}{25}$ V (2) $\frac{3\pi}{25}$ V

(3) $\frac{\pi}{25}$ V (4) $\frac{\pi}{75}$ V

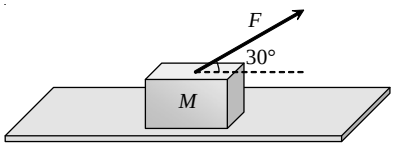
23. A particle of mass 2kg is kept at the center of a spherical shell of mass 100kg and radius 4m. Work done to take the particle away from the sphere to infinity is

(1) 1.334×10^{-9} J (2) 3.33×10^{-9}J
(3) 6.67×10^{-9} J (4) 6.67×10^{-11}J

24. **Assertion** : Two spheres of same size, material and identical surface, one solid and other hollow, are at same temperature. The fall of temerature is faster for hollow sphere.
Reason : The solid sphere emits more radiation than the hollow sphere.

(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

25.



A block of mass M = 4kg is resting on a rough horizontal surface for which the coefficient of friction is 0.3. When a force F = 20 N is applied, the acceleration of the block will be ($g = 10 m/s^2$)

(1) 3.7 m/s^2 (2) 1.8 m/s^2
(3) 2.1 m/s^2 (4) zero

26. A mass M suspended from a spring of negligible mass oscillates with a time period T. If additional mass 'm' is attached to M, then the new time period becomes 1.5 T. Then 'm' is

(1) $\frac{9}{16}$M (2) $\frac{25}{16}$M

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

27. A uniform rod of length L, hinged at the lower end is free to rotate in the vertical plane . If the rod is held vertically in the beginning and then released, the angular acceleration of the rod when it makes an angle of 45° with the horizontal

(1) $\frac{3g}{2\sqrt{2}L}$ (2) $\frac{6g}{\sqrt{2}L}$

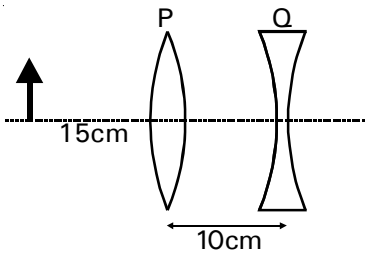
(3) $\frac{\sqrt{2}g}{L}$ (4) $\frac{2g}{L}$

28. A 236 Ω resistor has certain colour code. If one replaces the red colour by green in the code, the new resistance will be

(1) 256 Ω (2) 234 Ω

(3) 536 Ω (4) 436 Ω

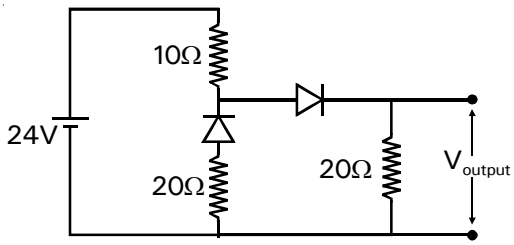
29.



In the figure shown, the lenses P and Q have focal lengths 10 cm and 20 cm respectively. The final image formed is

(1) real and diminished
(2) virtual and enlarged
(3) virtual and diminished
(4) at infinite distance and enlarged

30.



In the above circuit, output voltage is

(1) 12 V (2) 16 V

(3) 8 V (4) 0 V

31. Water rises in a capillary tube to a certain height such that the upward force due to surface tension is balanced by 9×10^{-3} N force due to the weight of the liquid. If the surface tension of water is 6×10^{-2} Nm^{-1}, the inner circumference of the capillary must be

(1) 0.125 m (2) 0.25 m

(3) 0.15 m (4) 0.025 m

32. If an electron in a hydrogen atom jumps from an orbit $n_i = 3$ to an orbit with level $n_f = 2$, the frequency of the emitted radiation is

(1) $\frac{3Rc}{4}$ (2) $\frac{cR}{6}$

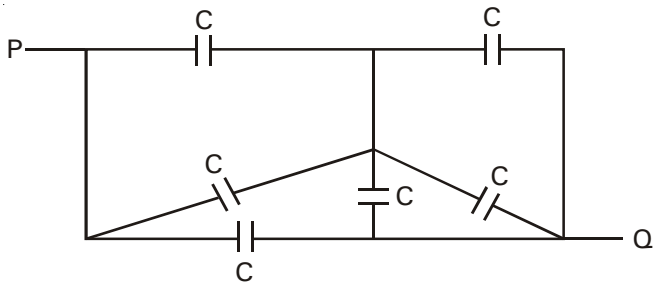
(3) $\frac{5Rc}{36}$ (4) $\frac{6Rc}{5}$

33. If a cylinder of diameter 2.1 cm at 30°C is to be slid into a hole of diameter 2.08 cm in a metal plate at the same temperature, then minimum required rise in the temperature of the plate is (Coefficient of linear expansion = 1.5×10^{-5}/°C)

(1) 540°C (2) 480°C

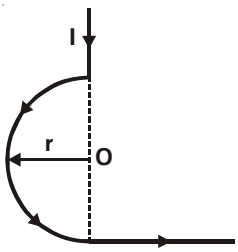
(3) 640°C (4) 720°C

34. The effective capacitance between P & Q is



(1) $\frac{6C}{5}$ (2) $\frac{11C}{6}$

(3) $\frac{11C}{5}$ (4) $\frac{5C}{6}$

35. 

In the figure, what is magnetic field at the point O

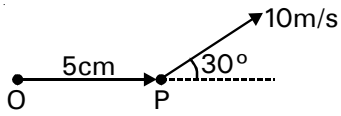
(1) $\frac{\mu_0 I}{4\pi r}$ (2) $\frac{\mu_0 I}{4\pi r} + \frac{\mu_0 I}{2\pi r}$

(3) $\frac{\mu_0 I}{4r} + \frac{\mu_0 I}{4\pi r}$ (4) $\frac{\mu_0 I}{4r} - \frac{\mu_0 I}{4\pi r}$

PHYSICS : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

36. In an electromagnetic wave, the peak value of electric is 80 V/m. The average energy flow is
(1) 10 W/m^2 (2) 8.5 W/m^2
(3) 7.5 W/m^2 (4) 8 W/m^2

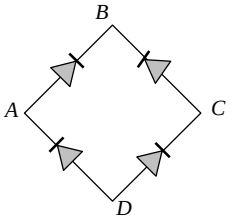
37. 

Angular velocity of position vector of a particle 'P' about 'O' in the figure shown is
(1) 100 radians/s (2) 200 radians/s
(3) 20 radians/s (4) $100\sqrt{3}$ radians/s

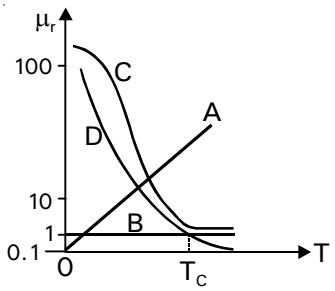
38. Two vessels A & B of different materials are similar in size in every respect and same quantity of ice filled in them gets melted in 20 minutes & 30 minutes respectively. Ratio of thermal conductivity of A to that of B will be
(1) 3 : 2 (2) 1 : 1
(3) 1 : 4 (4) 2 : 3

39. At what angle θ to the horizontal should an object be projected so that the maximum height reached is 33.3% of the horizontal range?
(1) 60° (2) 37°
(3) 45° (4) 53°

40. A rubber band exerts a constant restoring force of a 1 dyne for initial extension of 1 cm. Beyond this, it exert a force f = −10x dyne where 'x' is extension in cm. Find the work done in extending it through 3 cm.
(1) 45 erg (2) 46 erg
(3) 40 erg (4) 41 erg

41. 

In the diagram, the AC input is across the terminals A and C and the output is across the terminals B and D, then the output is
(1) zero (2) same as input
(3) full wave rectified (4) half wave rectified

42. 

For a ferromagnetic material, variation of relative permeability with temperature is best represented by
(1) A (2) B
(3) C (4) D

43. A boat takes one hours to travel 5 km and back in still water. If the velocity of water is 2 km/h, the time taken for going upstream 4 km and coming back is

(1) 1 h (2) 50 min
(3) 40 min (4) 1 h 20 min

44. A carnot engine has the same efficiency between 750 K to 500 K and between 'x' K to 600 K. The value of x is

(1) 1080 K (2) 800 K
(3) 900 K (4) 720 K

45. **Assertion** : Action and reaction forces never cancel out each other.

Reason : Action and reaction forces do not act at same time.

(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

46. A light ray is incident at angle of 60° on one face of a prism of angle 45°and the ray falls on the other surface at 90°. The refractive index of the material of prism is

(1) $\sqrt{2}$ (2) 1.5
(3) $\frac{\sqrt{3}}{2}$ (4) $\sqrt{\frac{3}{2}}$

47. Which of the following processes represents a gamma-decay?

(1) ${}^{A}_{Z}X + \gamma \rightarrow {}^{A}_{Z-1}X + a + b$
(2) ${}^{A}_{Z}X + {}^{1}_{0}n \rightarrow {}^{A-3}_{Z-2}X + c$
(3) ${}^{A}_{Z}X \rightarrow {}^{A}_{Z}X + f$
(4) ${}^{A}_{Z}X + {}_{-1}e \rightarrow {}^{A}_{Z-1}X + g$

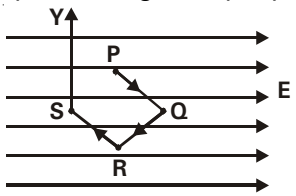
48. An unknown resistance P in series with a resistance of $5\,\Omega$ is connected in one gap of a metre bridge. Another resistance Q is connected in the other gap and the balance point is found at 60 cm. When only P is connected in the first gap, the balance point is found to shift to 40 cm. Then P =

(1) $3\,\Omega$ (2) $5\,\Omega$
(3) $2\,\Omega$ (4) $4\,\Omega$

49. A solid cylinder of mass 5 kg rotates about its axis with angular speed 20 rad/s. The radius of the cylinder is 2 m. What is the kinetic energy associated with the rotation of the cylinder?

(1) 1600 J (2) 2500 J
(3) 2000 J (4) 1800 J

50. Point charge 'q' moves from point P to point S along the path PQRS in a uniform electric field E in x-direction as shown. The coordinates of the points P, Q, R an S are (a, b, 0), (2a, 0, 0), (a, −b, 0) and (0, 0, 0) respectively. The work done by the field in the above process is given by expression



(1) qEa (2) −qEa
(3) $qEa\sqrt{2}$ (4) $qE\sqrt{[(2a)^2 + b^2]}$

CHEMISTRY : SECTION-A

All questions are compulsory in section A

51. The reaction with sodium hypoiodite is used for detection of _____ group. The correct fill up is

(1) CH_3CN (2) $CH_3CH(OH)$
(3) CH_3CO (4) Both (2) & (3)

52. Arrange the following alkenes in decreasing order of reactivity towards electrophilic addition

i. $(CH_3)_2C=CH_2$ ii. $CH_3CH=CH_2$
iii. $CH_2=CH-Cl$ iv. $CH_2=CH-CH_2Cl$
(1) i > iv > ii > iii (2) iv > i > ii > iii
(3) i > ii > iv > iii (4) iii > ii > i > iv

53. If electron is present in fourth excited state of H-atom then which of the following transitions should be possible for its jump to ground state?

(1) $5 \rightarrow 4 \rightarrow 3 \rightarrow 2 \rightarrow 1$ (2) $5 \rightarrow 1$

(3) $5 \rightarrow 3 \rightarrow 1$ (4) all of these

54. Which one of the following is correct configuration for high spin octahedral complex of Fe^{3+}? (atomic no. of Fe = 26)

(1) $t_{2g}^3 e_g^2$ (2) $t_{2g}^6 e_g^0$

(3) $e_g^3 t_{2g}^2$ (4) $e_g^4 t_{2g}^1$

55. Which of the following statements is incorrect?

(1) Some disinfectants can be used as antiseptics at low concentration

(2) sulphadiazine is a synthetic antibacterial

(3) Ampicillin is a natural antibiotic

(4) Aspirin is analgesic and antipyretic both

56. An organic compound on analysis was found to contain 0.032 % sulphur. If its molecule contains 2 atoms of sulphur, molecular mass of compound is

(1) 200 amu (2) 2000 amu

(3) 20000 amu (4) 200000 amu

57. The coagulating power of an electrolyte for arsenious sulphide sol decreases in the order

(1) $Na^+ > Al^{+3} > Ba^{+2}$

(2) $PO_4^{-3} > SO_4^{-2} > Cl^-$

(3) $Na^+ > Ba^{+2} > PO_4^{-3}$

(4) $Al^{+3} > Ba^{+2} > Na^+$

58. Which of the following has/have $\Delta H_{reaction}$ equal to $\Delta H_{atomisation}$ but not equal to $\Delta H_{sublimation}$?

a. $I_2(s) \rightarrow 2I(g)$

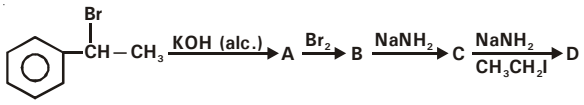
b. $CCl_4(s) \rightarrow C(g) + 4Cl(g)$

c. $CH_4(g) \rightarrow C(g) + 4H(g)$

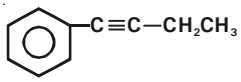
d. $Na(s) \rightarrow Na(g)$

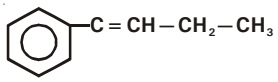
(1) both a & d (2) a, b & c

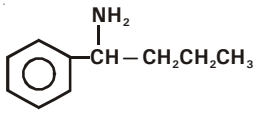
(3) c only (4) a, b, c & d

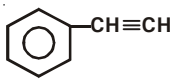
59. 

Which of the following would be D?

(1) 

(2) 

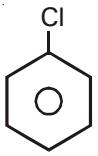
(3) 

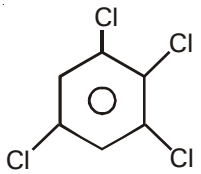
(4) 

60. The specific conductance of a salt of 0.01 M concentration is 1.061×10^{-4} S cm^{-1}. Molar conductance of the same solution in S cm^2 mol^{-1} will be

(1) 1.061×10^{-4} (2) 1.061

(3) 10.61 (4) 106.1

61. If the dipole moment of 

is x, then the dipole moment of 

is

(1) zero (2) x

(3) 3x (4) 2x

62. The standard electrode potentials of two half reactions at 25°C are

$Pb^{2+} + 2e^- \rightarrow Pb$ $\quad E^o = -0.13$ V

$Ag^+ + e^- \rightarrow Ag$ $\quad E^o = 0.80$ V

The possible cell reaction is

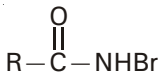
(1) $Pb^{2+} + 2Ag^+ \rightarrow 2Ag^+ + Pb$

(2) $Pb + 2Ag^+ \rightarrow Pb^{2+} + 2Ag^+$

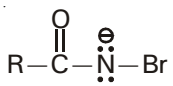
(3) $Pb + 2Ag^+ \rightarrow Pb^{2+} + 2Ag$

(4) $Pb + 2Ag \rightarrow Pb^{2+} + 2Ag^+$

63. Species involved in the Hoffmann's degradation reaction is

a. 

b. $R-N=C=O$

c. 

(1) a, b & c (2) both a & b

(3) both b & c (4) a only

64. Correct order of increasing dipole-moment among the following is

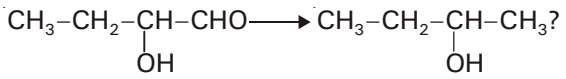
(1) $CH_3Br < CH_3I < CH_3Cl < CH_3F$

(2) $CH_3I < CH_3Br < CH_3Cl < CH_3F$

(3) $CH_3I < CH_3Br < CH_3F < CH_3Cl$

(4) $CH_3F < CH_3Cl < CH_3Br < CH_3I$

65. Which of the following is the best for the conversion?



(1) H_2/Ni

(2) Zn/Hg/HCl

(3) NH_2-NH_2/KOH/glycol

(4) all are equally good

66. Which of the following halogen can dispportionate in water

(1) F_2 (2) Cl_2

(3) I_2 (4) Both (2) &(3)

67. Which of the following equimolar solutions can act as an acidic buffer?

(1) NH_4Cl & NH_4OH (2) HCl & NaCl

(3) HCOOH & HCOONa (4) HNO_3 & NH_4NO_3

68. Given : $E^0_{ClO_3^-/Cl^-} = 0.627$ and $E^0_{Cl_2/Cl^-} = 1.36$ V

Then $E^0_{ClO_3^-/Cl_2}$ is equal to

(1) 0.480 V (2) 0.73

(3) 1.1 V (4) 1.987 V

69. Which of the following properties are true for terylene?

a. Step-growth polymer

b. used for making magnetic recording tapes

c. Condensation polymer

d. It is also called dacron

e. Thermosetting plastic

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

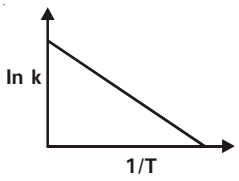
(3) b, c and d (4) a, b, c and d

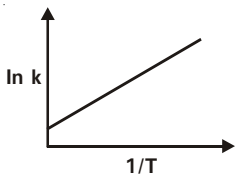
70. In case of H-atom the orbital with highest energy is

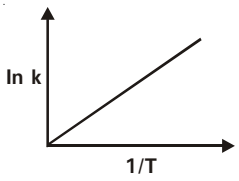
(1) 1s (2) 3d

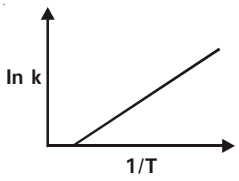
(3) 4s (4) 3p

71. According to Arrhenius equation rate constant k is equal to $Ae^{-E_a/RT}$. Which of the following options represents the graph of ln k vs $\frac{1}{T}$?

(1) 

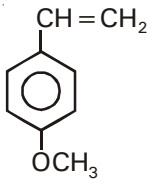
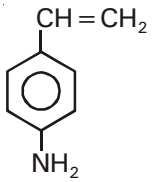
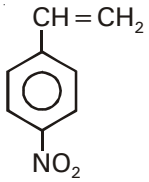
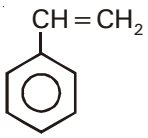
(2) 

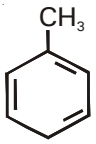
(3) 

(4) 

72. **Assertion** : The order of $CH_3CHO \rightarrow CO + CH_4$ is 3/2 .
Reason : The fractional order reactions can never be elementary .
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

73. Gas A can be liquefied at room temperature by applying pressure but gas B cannot. This shows
(1) T_C of B < T_C of A
(2) T_C of B > T_C of A
(3) T_C of A & B are > room temperature
(4) T_C of A = T_C of B

74. Which of the following monomers has the greatest ability to undergo cationic polymerisation?
(1) 
(2) 
(3) 
(4) 

75. In which of the following molecules $-CH_3$ shows $-I$ effect?
(1) $CH \equiv C - CH_3$ (2) $CH_3 - CH_3$
(3)  (4) $CH_3 - MgX$

76. In XY_3, Y^- ions have ccp arrangement and X^{3+} ions are present in octahderal voids. The fraction of total number of voids occupied is
(1) 1/3 (2) 1/9
(3) 1/6 (4) 1/12

77. Match List -I with List -II

a.	He	p.	treatment of cancer
b.	Rn	q.	used in flourescent bulbs
c.	Ne	r.	filled in oxygen cylinder of sea divers
d.	Ar	s.	used in arc welding of metals

(1) a–r, b–p, c–q, d–s (2) a–p, b–q, c–r, d–s
(3) a–r, b–s, c–q, d–r (4) a–s, b–p, c–r, d–q

78. Solubility product of $BaSO_4$ is 10^{-9}. The minimum concentration of $BaCl_2$ necessary to precipitate $BaSO_4$ from a solution of 0.001 M SO_4^{-2} ions is
(1) 10^{-6} (2) 10^{-7}
(3) 10^{-8} (4) 10^{-9}

79. **Statement-I** : Metals of second and third series of transition elements have greater enthalpies of atomisation.
Statement-II : Metal- Metal bonding is frequent in heavy transition elements.
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

80. $Cr_2O_7^{2-}$ oxidises Fe^{+2} as

$Cr_2O_7^{2-} + Fe^{+2} \rightarrow Fe^{+3} + Cr^{+3}$

What should be the molarity of the $Cr_2O_7^{2-}$ solution, 100 mL of which is needed to completely oxidise 500 mL of 0.2 M $FeSO_4$ solution?

(1) $\frac{1}{5}$ M (2) $\frac{1}{6}$ M

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

81. Which of these can show optical isomersm
(1) Propanoic acid
(2) 2-Hydroxy propanoic acid
(3) 1,2- Dichlorocyclohexane
(4) Both (2) &(3)

82. Which of the following is not correct?
(1) ΔG is zero for a reversible reaction
(2) ΔG is positive for a spontaneous reaction
(3) ΔG is negative for a spontaneous reaction
(4) ΔG is positive for a non-spontaneous reaction

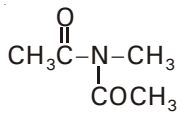
83. On applying pressure to equilibrium, ice $\rightleftharpoons$ water which phenomenon will happen
(1) more ice will be formed
(2) more water will be formed
(3) equilibrium will not be disturbed
(4) water will evaporate

84. H_2S, NH_3, BF_3 and SiH_4
In the above molecules, the decreasing order of bond angles is
(1) $NH_3 > H_2S > BF_3 > SiH_4$
(2) $H_2S > SiH_4 > NH_3 > BF_3$
(3) $BF_3 > NH_3 > SiH_4 > H_2S$
(4) $BF_3 > SiH_4 > NH_3 > H_2S$

85. The element named after Berkley Laboratory is
(1) Seaborgium (2) Tungsten
(3) Lawrencium (4) None of these

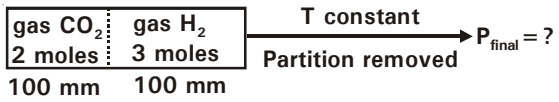
CHEMISTRY : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

86. Which of the following is not true for the reaction between excess CH_3COCl and $CH_3CH_2NH_2$?
(1) CH_3CO is the attacking electrophile and amine is the Nucleophile
(2) Major product is 
(3) 2° substituted amide is the final product
(4) Molecular mass of the final product is 87 amu

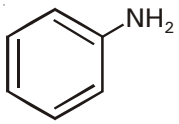
87. Calcium and Barium metals are often used to remove air from vacuum tubes. This is because of
(1) Low reactivity of calcium and Barium
(2) Reactivity of calcium and Barium with oxygen and nitrogen at elevated temperatures
(3) Reactivity of calcium and Barium with oxygen and nitrogen at low temperature
(4) Deliquescent nature of Calcium and Barium

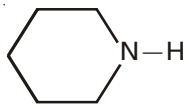
88. Analyse

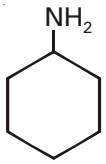


(1) 50 mm (2) 200 mL
(3) 500 mm (4) 100 mm

89. Which of the following has minimum pK_b?

(1) 

(2) 

(3) 

(4) CH_3NH_2

90. Which of the following statement is incorrect?
(1) Glucose and fructose both are monosaccharides
(2) Natural glucose and fructose are D-forms
(3) The solution having equal molecules of D-glucose and D-fructose is termed as 'invert sugar'
(4) Aldohexose exist in 2^4 optical forms in its cyclic structure

91. **Assertion** : Each Ellingham plot is a straight line except when some change in phase takes place.
Reason : The temperature at which such change occurs, is indicated by an increase in the slope on +ve side
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

92. 5 g of non-electrolyte solute is dissolved in 78 g of acetic acid to lower its melting point by 1.5°C. ($K_f = 3.9$ K kg/mol). The molar mass of solute is
(1) 176 g (2) 191 g
(3) 167 g (4) 179 g

93. 'A' compound reacts with metal chloride in presence of acid to give an orange red fumes of 'B'. Find A, B respectively
(1) $KMnO_4$, MnO_2 (2) $K_2Cr_2O_7$, CrO_2Cl_2
(3) $K_2Cr_2O_7$, Cr_2O_3 (4) $K_2Cr_2O_7$, K_2CrO_4

94. Consider the following complexes
i. $[Co(NH_3)_6]^{3+}$
ii. $[CoF_6]^{3-}$
iii. $[Co(NO_2)_6]^{3-}$
The decreasing order of wavelength of light absorbed by these complexes will be
(1) ii, i, iii (2) i, ii, iii
(3) iii, ii, i (4) iii, i, ii

95. Which of the following reactions of methane is incomplete combustion?
(1) $2CH_4 + O_2 \xrightarrow{Cu/523\ K/100\ atm} 2CH_3OH$
(2) $CH_4 + O_2 \xrightarrow{Mo_2O_3} HCHO + H_2O$
(3) $CH_4 + O_2 \longrightarrow C(s) + 2H_2O(l)$
(4) $CH_4 + 2O_2 \longrightarrow CO_2(g) + 2H_2O(l)$

96. Match the compound given in column I with the tests they can give in column II

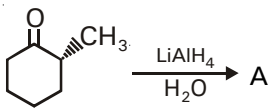
	Column-I		Column-II
a.	HCHO	i.	DNP
b.	CH_3COCH_3	ii.	Fehling
c.	CH_3COOH	iii.	Bisulphite
d.	$C_6H_5COCH_3$	iv.	Neutral $FeCl_3$

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

97. The molecule ML_x is planar with 6 pairs of electrons around M in the valence shell. The value of x is (assuming no Pi bond)
(1) 2 (2) 6
(3) 4 (4) 3

98. Which of the following drugs is an analgesic?
(1) Sulphaguanidine (2) Novalgin
(3) Analgin (4) both 2 & 3

99. **Statement-I** : The chloride of Be and Al have Cl–bridged structure. Both are soluble in organic solvents and act as lewis bases.
Statement-II : Hydroxides of Be and Al dissolve in excess alkali to give beryllate and aluminate ions.
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

100. 

In the above reaction, product A is

(1) racemic mixture
(2) diastereomeric mixture
(3) meso compound
(4) achiral

ZOOLOGY : SECTION-A

All questions are compulsory in section A

101. The transformation method that uses tungsten or gold particles coated with rDNA accelerated at high velocity is called
(1) Electroporation (2) Heat shock method
(3) Biolistics (4) Microinjection

102. Restriction enzymes are also called
(1) Molecular sutures (2) DNA ligases
(3) Molecular scissors (4) All of the above

103. If Henle's loop were to be absent from mammalian nephron, which one of the following is to be expected?
(1) There will be no urine formation
(2) There will be hardly any change in the quality and quantity of urine formed
(3) The urine will be more concentrated
(4) The urine will be more dilute

104. Which of the following statements is true?
(1) Human ribs are bicephalic
(2) 8th, 9th and 10th pairs of ribs are vertebrochondral ribs
(3) 1st two pairs of ribs are floating ribs
(4) Both 1 and 2

105. If for some reason our goblet cells are nonfunctional, this will adversely affect
(1) production of proenzymes
(2) absorption of nutrients in the small intestine
(3) activation of pancreatic proteolytic enzymes
(4) smooth peristalsis of food in the gut

106. Which animal of the following shows viviparity and mammary glands?
(1) *Ornithorynchus* and *Macropus*
(2) *Felis* and *Testudo*
(3) *Aptenodytes* and *Chameleon*
(4) *Felis* & *Delphinus*

107. **Statement-I** : Polyp and medusa forms alternate in life cycle of all coelentrates.
Statement-II : *Aurelia* exists as umbrella-shaped medusa while *Hydra* exists as cylindrical polyp.
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

108. W hich of the following are true if for bacterial transformation RE *Pvu I* was used along with pBR 322 ?
a. Non-recombinants will grow on both ampicillin & tetracycline media
b. Non transformants will not survive in presence of tetracycline
c. Recombinants will die in presence of ampicillin
(1) a, b & c (2) a & b but not c
(3) a & c but not b (4) b & c but not a

109. Role played by melatonin is
(1) regulation of diurnal rhythm and vision
(2) maintenance of temperature and defence capability
(3) stimulation of reproductive growth
(4) none of these

110. Identify the incorrect statement
(1) *Latimeria* is connecting link between fishes and amphibians
(2) Some land reptiles evolved into fish like reptiles arround 200 mya were *Tyrannosaurus*
(3) Jawless fish evolved about 350 mya
(4) None of these

111. Choose incorrect statement
(1) Osmolarity is increased in P.C.T.
(2) Osmolarity is decreased in ascending limb of HL
(3) Osmolarity is increased in descending limb of HL
(4) Osmolarity remain constant during ultra filtration

112. How many of the given hormones are produced only in a pregnant female in first trimester?
Cortisol, Relaxin, Progesterone, Estrogen, Thyroxine, Thymosin, Parathormone, Calcitonin, Aldosterone, ADH, hCG
(1) Five (2) Ten
(3) Eight (4) One

113. Which of the following is not a correct match?
(1) Octopus eye & mammalian – Analogy eye
(2) Similarity in vertebrate proteins–Homology
(3) Flipper of Penguins &–Convergence Dolphins
(4) Sweet potato and potato– Homology

114. Heart is located in
(1) Thoracic cavity, in between two lungs and slightly tilted to right
(2) Pericardial cavity and slightly tilted to right
(3) Pleural cavity and slightly tilted to left
(4) Thoracic cavity and slightly tilted to left

115. Silencing of m-RNA has been used in producing transgenic plants resistant to
(1) Bollworm (2) Corn borer
(3) Nematodes (4) Lepidopterans

116. A baby was born with 2 fingers less in the right hand. The number of bones in his left hand is likely to be
(1) 2 more than the right hand
(2) 6 more than the right hand
(3) 6 less than the right hand
(4) 2 less than the right hand

117. Which one of the following cellular parts is correctly described?
(1) SER – Site of protein synthesis
(2) Contractile vacuole – Tonoplast for excretion
(3) Centrosome – Containing two cylindrical structure
(4) Lysosomes –optimally active at alkaline pH

118. Match the following and mark the correct options

	Animal		**Respiratory organ**
a.	Earthworm	i.	Moist cuticle
b.	Aquatic arthropods	ii.	Gills
c.	Fishes	iii.	Lungs
d.	Birds/reptiles	iv.	Trachea

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

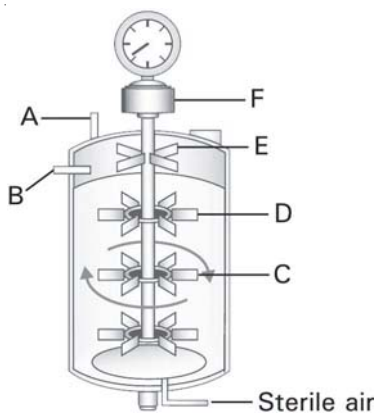
119. An undifferentiated mesoglea, can be seen in
(1) between the two germ layers-mesoderm & ectoderm
(2) animals showing pseudocoelom
(3) animals that show two embryonic germ layers
(4) animals showing true coelom

120. A certain RBC in the inferior vena cava will pass
(1) once through the heart to reach the brain
(2) twice through the heart to reach the brain
(3) the heart but never reach the brain
(4) bypass the heart to reach the brain

121. Number of chromosomes and content of DNA is same in
(1) sperm and 1st polar body
(2) 2° spermatocyte and 2° oocyte
(3) spermatogonia and 2° oocyte
(4) both (1) and (2)

122. **Assertion** : A pregnant female exposed to an X-ray at 6 weeks of pregnancy has increased risk of malformation of fetus.
Reason : By the end of four weeks most major organ systems, limbs and external genitalia are formed.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

123. In the given diagram of the bioreactor, what are the functions of D and E respectively.



(1) E-sterilizes the material, D-facilitates even mixing of contents
(2) E-breaks the forming foam while, D-facilitates even mixing of contents
(3) D-provides increased surface area for oxygen transfer while, E-provides temperature control
(4) E-removes small volumes of culture while, D-rotates the culture broth.

124. The stages through which a cell passes from one division to the next is called the
(1) Cell division (2) Cell maturation
(3) Cell cycle (4) Cell differentiation

125. Classify the following statements as true or false and choose the correct option
a. Excess use of herbicides and pesticides has resulted in selection of resistant varieties in a much lesser time scale.
b. Natural selection is based on certain observations which are factual.
c. Darwin had talked of inheritable 'factors' influencing phenotype.
d. According to Malthus, resources grow arithmatically and population size increases geometrically
(1) a–T, b–F, c–T, d–T
(2) a–F, b–F, c–T, d–T
(3) a–T, b–T, c–F, d–T
(4) a–T, b–F, c–T, d–F

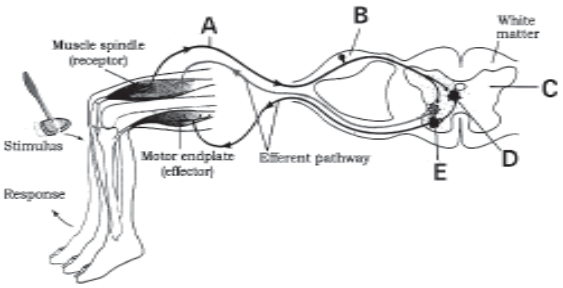
126. LAB produces acids which
(1) completely digest the milk proteins
(2) coagulate and partially digest milk proteins
(3) do not act on milk proteins
(4) only coagulate milk proteins

127. If we compare Myxodema and Cretinism then we find that both are
   a. deficiency disease, with reduced BMR
   b. related to thyroid, with mental retardation
   c. with lower IQ and due to deficiency of pituitary hormones
   (1) b & c (2) a & b
   (3) a only (4) a & c

128. Breathing is
   (1) Process of exchange of O_2 from the atmosphere with O_2 present within tissue
   (2) Process of exchange of CO_2 from the atmosphere with CO_2 produced by the cells
   (3) Process of exchange of O_2 from the atmosphere with CO_2 produced by the cells
   (4) All of these

129. Which of the following is false w.r.t the cells in the adult animals that do not appear to exhibit division
   (1) They exist in G_1 phase
   (2) enter in inactive stage
   (3) remains is quiescent stage (G_0)
   (4) can never proliferate

130. An incorrect statement about the labelled parts is



   (1) C– contain interneurons
   (2) B–contain pseudounipolar neurons
   (3) A– contain motor fibres
   (4) none of these

131. Miller performed his experiment with
   (1) CH_4, H_2,NH_3 and water vapours at 1800°C
   (2) CH_4, H_2,NH_3 and water vapours at 800°C
   (3) CO_2, H_2, NH_3 and CO_2 vapours at 800°C
   (4) CO_2, CH_4, NH_3 and H_2 vapours at 1600°C

132. If the pituitary gland of an adult rat is surgically removed, which of the following endocrine gland will be less affected
   (1) adrenal cortex (2) thyroid
   (3) gonads (4) adrenal medulla

133. Meiosis II is necessary to
   (1) reduce number of chromosome
   (2) increase number of cells
   (3) induce haploidy of DNA
   (4) none of these

134. Which of the following statement is incorrect ?
   (1) Presence of dorsal solid notochord, dorsal hollow nerve chord, pharyngeal gill slits and post-anal tail are characteristics of chordates.
   (2) Urochordata and cephalochordate are basically subclasses according to taxonomic hierarchy.
   (3) Notochord extends up to head and persists throughout life in cephalochordates.
   (4) Cartilagenous fishes show internal fertilization and are mostly viviparous.

135. Number of meiosis required to form 24 male gametes
   (1) 6 (2) 4
   (3) 8 (4) 24

ZOOLOGY : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

136. Contraceptive pills have to be taken daily for a period of _____ days starting preferably within the first _____ days of menstrual cycle. After a gap of _____ days it has to be repeated in the same pattern till the female desires to prevent conception.
   (1) 14, 5, 7 (2) 17, 4, 4
   (3) 21, 5, 4 (4) 21, 5, 7

137. How many of the following statements are True?
   a. *Salmonella typhi* is a pathogenic bacterium which causes typhoid fever in human beings.
   b. Dengue fever could be confirmed by Widal test.
   c. Mary Mallon was a cook by profession and was a typhoid carrier.
   d. Intestinal perforation and death may occur in severe cases by the infection of *Salmonella typhi*.
   e. Pneumonia in humans infects the alveoli (air filled sacs) of the lungs.
   (1) Five (2) Two
   (3) Three (4) Four

138. **Statement-I** : Earth was supposed to have been formed about 4.5 million years back.
   Statement-II : Life appeared 500 billion years after the formation of earth.
   (1) Both statements I & II are correct
   (2) Both statements I & II are incorrect
   (3) Statements I is correct but statement II is incorrect
   (4) Statements I is incorrect but statement II is correct

139. Which of the following statement is true ?
(1) Cellulose and Starch are helical structures which can hold I_2 and give blue colour
(2) Paper, cotton and wood all are cellulosic in nature
(3) Amylose and amylopectin when acted upon by amylase give isomaltose and maltose respectively
(4) Aminosugars are modified sugars and used in formation of DNA and RNA

140. Which of the following set represents all viral diseases?
(1) Influenza, Tuberculosis, Common cold, Mumps
(2) Mumps, Dengue, Chickungunya, Measles
(3) Measles, Pheumonia, Diphtheria, Rabies
(4) Rabies, Polio, Flu, Enteric fever

141. Adrenal medullary hormones _____ and sympathetic system _____ heart rate respectively
(1) increase,decrease (2) decrease, increase
(3) increase, increase (4) decrease, decrease

142. Fibres secreted by cells of connective tissue provide
(1) rapid communication & support
(2) rapid communication, transport & strength
(3) flexibility, elasticity & strength
(4) flexibility, elasticity & transport

143. The main arena of cellular activities is
(1) nucleus in animal cell
(2) vacuole in plant cell
(3) Cytoplasm in both the plant and animal cell
(4) Cytoplasm in animal cell only

144. How many statements are correct ?
a. Neural tissue have lipids with simple structures'
b. Arachidonic acid has 20 carbon atoms including the carboxyl carbon.
c. The chemical and physical properties of amino acids are essentially of the amino, carboxyl and R functional groups.
d. Thymidine, cytidine and uridine and nucleotides and adenosine and guanosine are nucleosides
(1) **2** (2) 3
(3) 4 (4) 5

145. **Assertion** :Baculoviruses are used as biological control agents in the genus Nucleopolyhedro virus.
Reason : Baculoviruses are pathogens that do not attack insects and other arthropods .
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

146. The moist surface of buccal cavity is lined by
(1) simple squamous epithelium
(2) simple cuboidal epithelium
(3) compound epithelium
(4) simple columnar epithelium

147. What is common to Coelentrates, Ctenophores and Echinoderms?
(1) Asymmetrical symmetry
(2) Diploblastic nature
(3) Radial symmetry
(4) Closed type circulation

148. Match the cartilage under column I to its site in the human body under column II

	Column I		**Column II**
a.	Hyaline cartilage	p.	Pinna & external auditory canal
b.	white fibrous cartilage	q.	between cranial sutures
c.	Yellow elastic cartilage	r.	intervertebral discs
		s.	articular surfaces at joints

(1) a-p, b-q, c-r (2) a-s, b-p, c-q
(3) a-s, b-r, c-p (4) a-r, b-q, c-p

149. In the human female, menstruation can be deferred by the administration of
(1) LH only
(2) FSH only
(3) Combination of FSH and LH
(4) Combination of oestrogen and progesterone

150. Which of the following statements are incorrect?
a. Practice of yoga has recently started to achieve physical and mental health.
b. Diseases which are easily transmitted from one person to another, are called infectious diseases.
c Every one of us is not susceptable to the infectious diseases at sometime or other.
d. Among non infectious diseases AIDS is major cause of death.
e. The pathogens can not enter in our body by direct means, multiply and interfere with normal vital activities.
(1) a, b & d (2) a, c & e
(3) a & b (4) a, c, d & e

BOTANY : SECTION-A

All questions are compulsory in section A

151. Which of the following is a symbiotic nitrogen fixer in non legumes?
(1) *Azotobacter* (2) *Frankia*
(3) *Rhizobium* (4) *Bacillus*

152. Greater is the distance between the two genes on a chromosome
(1) greater is the linkage strength
(2) lesser is the linkage strength
(3) linkage strength remains unchanged
(4) there is no relationship between the two

153. Experimental verification of the chromosomal theory of inheritance was carried by
(1) Sutton and Boveri (2) T.H. Morgan
(3) Alfred Sturtevant (4) Henking

154. Which is incorrect w.r.t. effects of sewage and industrial waste on lakes?
(1) These decline the growth of algae
(2) These may poison whole population of fishes
(3) Thermal wastewater reduces the number of organisms sensitive to high temperature
(4) These overstimulate the growth of algae

155. Select the incorrect statement
(1) Leaf tendrils are formed in cucumber
(2) Opening of flowers is centrifugal in cymose inflorescence
(3) Lamina is modified to capture insects in Venus fly trap
(4) Leaves are edible in onion.

156. Read the following statements w.r.t. decomposition
a. It is controlled by chemical composition of detritus only.
b. It is an oxygen requiring process
c. It is regulated by temperature and soil moisture
d. It is faster if detritus is rich in nitrogen and water soluble substances.
e. Anaerobic conditions promote decomposition.
Select the option for correct ones
(1) a, b, c and d (2) a, c, d and e
(3) b, c and d only (4) a, d and e only

157. How many algae among the list given below are red algae?
Gracilaria , Volvox, Chondrus, Chlorella, Gelidium Porphyra, Fucus, Polysiphonia.
(1) Two (2) Three
(3) Four (4) Five

158. Biofortification is
(1) strengthening living organisms against diseases
(2) developing crop plants with higher levels of vitamins, proteins and minerals
(3) using living organisms for the protection of crop plants
(4) all of these

159. The exotic collection of wheat and rice which became the basis of green revolution in India are respectively
(1) Sharbati Sonora and Kalyan Sona
(2) Kalyan Sona and Jaya
(3) Sonora 64 and IR-8
(4) Jaya and Ratna

160. **Assertion** : Biomagnification of DDT can enhance the decline in bird population
Reason : DDT causes thickening of egg shell and their delayed breaking by disturbing calcium metabolism.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

161. Loss of bidiversity in a region may lead to
a. decline in plant production
b. enhanced resistance to environment perturbations such as drought
c. increased variability in plant productivity
d. decreased variability in pest & disease cycle
(1) both a & b (2) a only
(3) both a & c (4) a, b & d

162. How many of the following features are found in a person affected with Down's syndrome?
a. Big and wrinkled tongue
b. Partially open mouth
c. Palm crease
d. Mental retardation
e. Gynaecomastia
(1) 3 (2) 4
(3) 5 (4) 2

163. Which one of the following is post-fertilisation event?
A - Megaspore $\rightarrow$ Embryo sac
B - Pollination
C - Definitive nucleus $\rightarrow$ PEN $\rightarrow$ endosperm
D - Zygote $\rightarrow$ embryo
(1) A and C (2) B and D
(3) C and D (4) B and C

164. Which of the following process occurs in template independent manner?
(1) hnRNA synthesis (2) tRNA synthesis
(3) 3' tailing of mRNA (4) rRNA synthesis

165. How many statements are incorrect w.r.t. Archaebacteria
a. They have different cell wall structure
b. Presence of peptidoglycan and cellulose in cell wall
c. Different 16S rRNA nucleotide sequence from other bacteria
d. Most ancient bacteria
(1) Two (2) One
(3) Three (4) None

166. Conformers are those
(1) which cannot maintain constant internal environment
(2) whose, body temperature changes with surrounding temperature
(3) whose osmotic concentration of body fluids change with surrounding water osmotic concentrations
(4) all of these

167. Conjoint, collateral, endarch and closed vascular bundles are found in
(1) Monocot root (2) Monocot stem
(3) Dicot root (4) Dicot stem

168. Pollen grains
(1) are indepedent, photosynthetic gametophytes of angiosperms
(2) are shed at 3–celled stage in most flowering plants
(3) lose viability in 30 minutes always
(4) of carrot grass may cause allergies and bronchial diseases

169. **Assertion** : Biodiversity of the prokaryotes cannot be estimated
Reason : Conventional taxonomic methods are not suitable for identification and characterisation of microbes.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

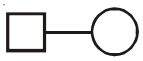
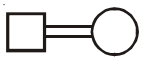
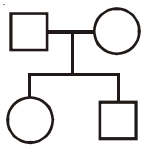
170. In F_2 generation a ratio of 1 : 4 : 6 : 4 : 1 is obtained instead of 9 : 3 : 3 : 1 when two pairs of genes are considered, it indicates
(1) pleiotropic effect to genes
(2) quantitative inheritance
(3) incomplete dominance
(4) qualitative inheritance

171. Which of the following rRNA is not synthesized by RNA polymerase-I ?
(1) 5 S rRNA (2) 28 S rRNA
(3) 18 S rRNA (4) 5.8 S rRNA

172. In a fertilised embryo sac, the haploid, diploid and triploid structures are:
(1) synergid, zygote and primary endosperm nucleus
(2) synergid, antipodal and polar nuclei
(3) antipodal, synergid and primary endosperm nucleus
(4) synergid, polar nuclei and zygote.

173. The interaction between fungi with roots of higher plants is
(1) Mutualism (2) Protocooperation
(3) Commensalism (4) Competition

174. Match description in column I with the symbols used in human pedigree analysis in column II.

Column I		**Column II**
a.		p. consanguineous mating
b.		q. mating
c.		r. parents above and children below
d.		s. sex unspecified

(1) a-p, b-q, c-s, d-r (2) a-q, b-p, c-s, d-r
(3) a-q, b-p, c-r, d-s (4) a-s, b-p, c-q, d-r

175. Identify the incorrect statement
(1) ABA acts as antogonistic to GAs
(2) Went Isolated auxins from tips of coleoptiles of oat seedlings
(3) Cousins Identified kinetin
(4) Gibberellins promote bolting in beet.

176. In mitochondrial ETS, transfer of electrons between enzyme complex III and IV occurs by
(1) Ubiquinol
(2) Small extrinsic protein
(3) Mobile carrier protein
(4) Succinate dehydrogenase

177. Pick the incorrect statement
(1) unlimited resources result in exponential growth
(2) logistic growth $= \frac{dN}{dt} = rN(K - N)/K$
(3) logistic growth gives J-shaped curve
(4) K is the carrying capacity of a particular habitat which limits the growth

178. **Statement- I** : ABA induce parthenocarpy in tomatoes
Statement- II : ABA does not stimulate closure of stomata in plants
(1) Both statement -I and statement- II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement- II is correct

179. Identify the group on the basis of following features
a. Have stiff cellulosic plates on the outer surface
b. Toxins released by them may even kill marine fishes
(1) Desmids (2) Diatoms
(3) Dinoflagellates (4) Slime moulds

180. Choose correct option w.r.t. adapter molecule
(1) The 2-D structure is L shaped
(2) It has unpaired nitrogenous bases as well
(3) Amino acid attachment site is at 5′ end
(4) The 3-D structure looks like a clover-leaf

181. Autoradiography techniques in photosynthesis experiments using radioactive Carbon was used by
(1) Rubén and Kamen (2) Engelmann
(3) Calvin (4) Hill

182. How many of the following statements are correct ?
a. Pollination does not guarantee the transfer of the right type of pollen
b. Pollination by wind is more common amongst biotic pollinations
c. Cleistogamous flowers are invariably allogamous
d. Three cells are at the chalazal end and are called synergids
e. Ovule is integumented megasporangium
(1) 1 (2) 2
(3) 3 (4) 4

183. In sickle cell anemia glutamic acid is replaced by valine. Which of the following codons code for glutamic acid and valine respectiely?
(1) GAG and GAA (2) GAC and GAC
(3) GAG and GUG (4) GUG and GAC

184. Which of the following statement is incorrect?
(1) Character which unified all members in Plantae in the two kingdom system was presence of cell wall
(2) Kingdom Mycota includes unicellular prokaryotes.
(3) The 3 Domain system had 4 kingdoms in domain Eukarya.
(4) Producers belong to three kingdoms in Whittaker's 5 kingdom classification.

185. Which of the following plants does not have free living gametophytes?
(1) *Sphagnum* and *Riccia*
(2) *Pteris* and *Marchantia*
(3) *Riccia* and *Dryopteris*
(4) *Pinus* and Mango

BOTANY : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

186. Which of the following statements is correct?
(1) *Parthenium* is an endemic species of our country
(2) African catfish is not a threat to indigenous catfishes.
(3) Steller's sea cow is an extinct animal.
(4) *Lantana* is popularly known as carrot grass

187. Select the correct match
(1) Wheat - albuminous seed
(2) Strawberry- True fruit
(3) Grasses- Offsets
(4) Orchid - Single seeded fruit

188. Select the option with correct set of statements for human genome project
a. Less than 2% of the genome codes for protein
b. About 4.1 million location where SNPs present
c. Chromosome Y has 231 genes
d. The average gene consist of 300 base pairs
(1) Only (a), (b) and (c)
(2) Only (a), (b) and (d)
(3) Only (a) and (c)
(4) (a), (b), (c) and (d)

189. In life cycle of *Chlamydomonas*, *Volvox* , *Spirogyra*
(1) sporophytic generation is represented by single celled zygote
(2) Gametophyte is represented by single celled gamete
(3) sporophyte is multicellular
(4) Gametophyte is independent but short lived

190. Which of the following is not an example of primary succession?
(1) Cooled volcanic lava
(2) Sand dunes
(3) Bare rocks
(4) Cut forest

191. Select the incorrect statement from the options given below
(1) Onion flower show epiphyllous condition
(2) Sweet pea and Tulip are ornamental members of liliaceae
(3) In potato family , plants are commonly herbaceous.
(4) Mango is a drupe fruit

192. A plant heterozygous for three allelic pairs, undergoes selfing, then how many genotypes regarding these alleles will be produced in next generation?
(1) 8 (2) 64
(3) 9 (4) 27

193. Which of the following statements are false?
(1) Calcium is an immobile element
(2) Aspargine has less nitrogen than aspartic acid.
(3) Ureides are transported via xylem.
(4) Enzyme nitrogenase requires Molybdenum for its activity.

194. **Statement- I** : Some bacteria are pathogens causing damage to crops, pets and farm animals
Statement- II : Cholera, typhoid, tetanus, citrus canker are diseases caused by bacteria.
(1) Both statement -I and statement- II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement- II is correct

195. Select the incorrect statement for e-wastes
(1) Recycling is the only solution for treatment
(2) They are buried in landfills or incinerated
(3) Bulk of the waste is biodegradable
(4) Used to recover metals like copper, iron, silicon, nickel and gold

196. Which is correct sequence of the four stages a, b, c & d of a microspore maturing into a pollen grain?

a. 
b. 
c. 
d. 

(1) $b \rightarrow a \rightarrow c \rightarrow d$
(2) $c \rightarrow a \rightarrow d \rightarrow b$
(3) $b \rightarrow c \rightarrow a \rightarrow d$
(4) $a \rightarrow c \rightarrow d \rightarrow b$

197. Match the following

i.	Promoter	a.	Termination
ii.	Rho factor	b.	Initiation
iii.	RNA polymerase II	c.	hn RNA
iv.	Splicing	d.	σ factor
		e.	m RNA
		f.	introns
		g.	prokaryotes

(1) i-b, d ; ii-a, g ; iii-c, e; iv-f
(2) i-b, a ; ii-d, g ; iii-c, e; iv-f
(3) i-a, d ; ii-b ; iii-c, e ; iv-f
(4) i-b, a ; ii-f,e ; iii-c, d ; iv-f

198. Which of the following is incorrect match?
(1) Apoplast……. dead cell wall and intercellular spaces.
(2) Guttation…… hydathodes.
(3) Symplast…plasma membrane and cytoplasm
(4) Casparian strips ….. permeable to water.

199. **Assertion** : Amount of secondary xylem produced is more than secondary phloem
Reason : The cambium is generally more active on the inner side than on the outer side
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

200. Which is incorrect w.r.t. seed maturation?
(1) Its water content is reduced to 40-50%
(2) General metabolic activity of the embryo slows down
(3) Embryo may enter a state of inactivity
(4) Embryo may enter a state of germination if favourable conditions are available