Dated : 02-05-2023

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Test Booklet Code **A**

MM : 720

Test Series [Option-1] for NEET-2023

Time : 3 hrs. 20 min.

Mock Test

PHYSICS : SECTION-A

All questions are compulsory in section A

1. The range of a projectile when fired at 75° with the horizontal is 0.5 km. What will be its range when fired at 45°?
   (1) 0.5 km
   (2) 1 km
   (3) 1.5 km
   (4) 2 km

2. For hydrogen gas $C_P - C_V = a$ and for oxygen gas $C_P - C_V = b$. So relation between a and b is given by
   (1) $a = 16b$
   (2) $b = 16a$
   (3) $a = 4b$
   (4) $a = b$

3. A clock based on spring is placed in a space laboratory orbiting around the Earth at a height 0.5R, where R is the radius of the Earth. The clock will_____ as compared to that on earth.
   (1) run faster
   (2) run slower
   (3) run at same rate
   (4) not run at all

4. A neutron makes a head-on elastic collision with a stationary deuteron. The fractional energy loss of the neutron in the collision is
   (1) 16/81
   (2) 8/9
   (3) 8/27
   (4) 2/3

5. If 1 unit of mass = 4 kg; 1 unit of length = $\frac{1}{4}$ m and 1 unit of time = 5 sec, then 1 Joule = x units of energy in this system where x =
   (1) 100 units
   (2) 0.01 units
   (3) 200 units
   (4) 0.02 units

6. Two similar spheres having +q and −q charge are kept at a certain distance. F force acts between two. If in middle of two spheres, another similar sphere having +q charge is kept, then it experiences a force
   (1) zero
   (2) 8F towards +q charge
   (3) 8F towards −q charge
   (4) 4F towards +q charge

7. Centre of mass of three particles 10 kg, 20 kg and 30 kg is at (0, 0, 0). Where should a particle of 40 kg be placed so that the combined centre of mass will be at (3, 3, 3)?
   (1) (0, 0, 0)
   (2) (7.5, 7.5, 7.5)
   (3) (1, 2, 3)
   (4) (4, 4, 4)

8. The Poisson's ratio practically cannot have the value
   (1) 0.7
   (2) 0.2
   (3) 0.1
   (4) 0.5

9. A person suffering from hypermetropia requires which type of spectacle lenses
   (1) Concave lens
   (2) Plano-concave lens
   (3) Convexo-concave lens
   (4) Convex lens

10. Rain is falling vertically with a speed of 20 m/s. Winds starts blowing after sometime with a speed of 11.55 m/s in south to north direction. In which direction should a standing boy hold his umbrella?
    (1) 53° with the vertical towards north
    (2) 30° with the vertical towards north
    (3) 53° with the vertical towards south
    (4) 30° with the vertical towards south

11. If a plane mirror is rotated through an angle of 5° and incident ray remains unchanged, then angle through which reflected ray will be rotated is
    (1) 5°
    (2) 7.5°
    (3) 10°
    (4) 15°

12. A gas at NTP is suddenly compressed to one-fourth of its original volume. If $\gamma = 1.5$, then the final pressure is

(1) 4 atmosphere

(2) $\frac{3}{2}$ atmosphere

(3) 8 atmosphere

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

13. Two coils of self inductance L_1 and L_2 are placed so close to each other so that the effective flux in one coil is completely linked with the other, then the mutual inductance M between them is given by

(1) $M = \sqrt{L_1 L_2}$

(2) $M = L_1 - L_2$

(3) $M = L_1 / L_2$

(4) $M = L_1 + L_2$

14. The speed of the exhaust from a 2000 kg rocket, set for vertical firing on earth surface, is 1 km/s. To provide an initial upward acceleration of 10 m/s^2, the amount of gas ejected per second should be

(1) 40 kg/s

(2) 80 kg/s

(3) 60 kg/s

(4) 20 kg/s

15. At what speed should a source of sound move so that stationary observer finds the apparent frequency equal to half of the original frequency? Speed of sound is 'v'.

(1) v/2

(2) 2v

(3) v/4

(4) v

16. A transverse wave is reflected from a rigid support. The change in phase on reflection will be

(1) $\pi/4$

(2) $\pi/2$

(3) π

(4) 2π

17. In an electromagnetic wave, oscillating electric and magnetic vectors are

(1) oriented along the same direction but differ in phase by 90°

(2) oriented along the same direction and are in phase

(3) in mutually perpendicular directions and are in phase

(4) in mutually perpendicular directions and differ in phase by 90°

18. If a ball is thrown vertically upwards with speed u, the distance covered during the last 't' seconds of its ascent is

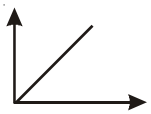
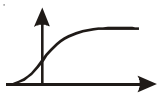
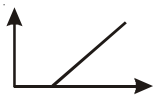
(1) $\frac{1}{2}gt^2$

(2) $ut - \frac{1}{2}gt^2$

(3) (u–gt)t

(4) ut

19. Match the figures for a given photosensitive material in column I with observations in column II.

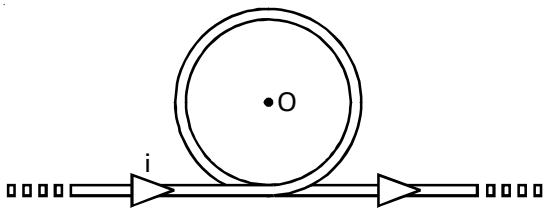
Column I		**Column II**
a.		p. graph between stopping potential and frequency of light
b.		q. graph between saturation photoelectric current and intensity of light
c.		r. graph between photoelectric current & potential of collector plate

(1) a-r, b-p, c-q

(2) a-q, b-r, c-p

(3) a-r, b-q, c-p

(4) a-p, b-r, c-q

20. 

A part of a long straight wire is bent to form a circular loop of radius 'r' and a current 'i' is passed through as shown in figure. Magnetic field at the centre O of the circular loop is

(1) $\frac{\mu_0 i}{2\pi r}(\pi + 1)\odot$

(2) $\frac{\mu_0 i}{2\pi r}(\pi - 1)\otimes$

(3) $\frac{\mu_0 i}{2\pi r}(\pi + 1)\otimes$

(4) $\frac{\mu_0 i}{2\pi r}(\pi - 1)\odot$

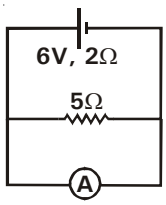
21. A frog can be levitated in a magnetic field produced by a vertical solenoid placed below the frog. This is possible because the body of the frog behaves as
(1) paramagnetic
(2) diamagnetic
(3) ferromagnetic
(4) antiferromagnetic

22. A car whose wheels are 1.5 metre apart has its C.G. 0.75 metre above the ground. The maximum speed at which it can go round an unbanked curve of radius 20 metre is
(1) 10 m/s
(2) 14 m/s
(3) 18 m/s
(4) none of these

23. A very thin gold foil was used in alpha-particle scattering experiment so that there should be
(1) a single collision with the target body
(2) multiple collisions with the target body
(3) minimum use of gold being costly metal
(4) none of these

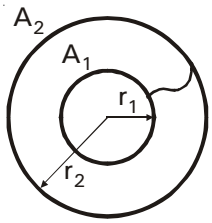
24. With what angular velocity the earth should spin in order that a body lying at 30° latitude may become weightless [R is radius of earth and g is acceleration due to gravity on the surface of earth]
(1) $\sqrt{\frac{2g}{3R}}$
(2) $\sqrt{\frac{4g}{R}}$
(3) $\sqrt{\frac{g}{3R}}$
(4) $\sqrt{\frac{4g}{3R}}$

25. The ammeter used in the circuit is ideal. What will be its reading?



(1) $\frac{6}{7}$ A
(2) $\frac{6}{5}$ A
(3) 3 A
(4) Zero

26. Two persons A and B are walking with speed 4 km/h and 5 km/h respectively in the same direction. How far will B be from A after 3 hours?
(1) 2 km
(2) 1 km
(3) 4 km
(4) 3 km

27. 

Two spherical conductors A_1 and A_2 of radii r_1 and r_2 are placed concentrically in air the two are connected by a copper wire as shown in figure. Then equivalent capacitance of system is
(1) $4\pi\varepsilon_0\frac{r_1r_2}{r_2-r_1}$
(2) $4\pi\varepsilon_0(r_1+r_2)$
(3) $4\pi\varepsilon_0 r_2$
(4) $4\pi\varepsilon_0 r_1$

28. Zener breakdown takes place if
(1) doped impurity is low
(2) doped impurity is high
(3) less impurity in N-part
(4) less impurity in P-type

29. **Assertion :** If acceleration of particle is decreasing, then speed of particle will also decrease.
Reason : Acceleration is the rate of change of velocity.
(1) Both Assertion and Reason are true and the reason is correct explanation of assertion.
(2) Both Assertion and Reason are true but reason is not correct explanation of assertion.
(3) Assertion is true but Reason is false.
(4) Assertion is false.

30. An alternating voltage is connected in series with a resistance R and an inductance L If the potential drop across the resistance is 200 V and across the inductance is 150 V, then applied voltage is
(1) 350 V
(2) 250 V
(3) 500 V
(4) 300 V

31. If momentum of a particle is increased by 100%, the de-Broglie wavelength
(1) increases by 100%
(2) decreased by 100%
(3) increases by 50%
(4) decreases by 50%

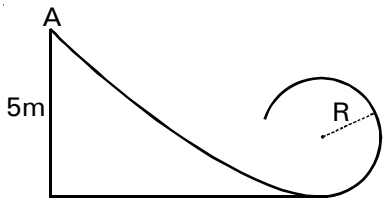
32. Kinetic energy of charged particle of mass m, charge q revolving in a magnetic field B and radius r in a cyclotron is given by

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

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

(3) $\frac{B^2q^2r^2}{m}$

(4) $\frac{B^2q^2r^2}{2m}$

33. 

A body slides from point A down the frictionless track which ends in a circular loop of radius R. Maximum value of R for the body to successfully complete the loop is

(1) 5 m

(2) $\frac{15}{4}$ m

(3) $\frac{10}{3}$ m

(4) 2 m

34. A uniform rod of moment of inertia I about a perpendicular bisector has coefficient of linear expansion α. If the temperature of rod is slightly increased by Δt, its moment of inertia increases by

(1) zero

(2) $\alpha I \Delta t$

(3) $2\alpha I \Delta t$

(4) $3\alpha I \Delta t$

35. Two parallel glass plates, kept vertical a distance 'x' apart, are dipped partly in water of density 'd'. If the surface tension of water is T, then rise of water between the plates will be

(1) $\frac{4T}{xdg}$

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

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

(4) zero

PHYSICS : SECTION-B

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

36. For maximum power factor in a series LCR circuit, we require

(1) inductive reactance equal to zero

(2) capacitive reactance equal to zero

(3) inductive reactance equal to capacitive reactance

(4) resistance equal to zero

37. How much water should be filled in a container 35 cm in height, so that it appears half filled when viewed from the top of the container (given that refractive index of water is 4/3)

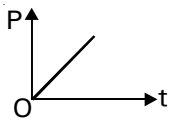
(1) 15 cm

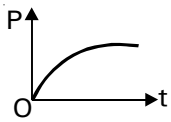
(2) 20 cm

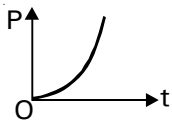
(3) 21 cm

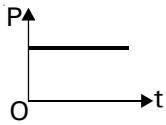
(4) 24 cm

38. A motor drives a body along a straight line with a constant force. The power 'P' developed by the motor varies with time 't' as

(1) 

(2) 

(3) 

(4) 

39. A diffraction pattern is formed on a screen by a parallel monochromatic beam of light incident normally on a narrow slit. At the first secondary maximum of the diffraction pattern, the phase difference between the rays coming from the two ends of the slit is

(1) 0

(2) $\frac{\pi}{2}$

(3) π

(4) 3π

40. A body floats with half of its volume outside water and 3/4 of its volume outside another liquid. The density of the other liquid is

(1) 1.5 gm/cc

(2) 2 gm/cc

(3) 2.5 gm/cc

(4) 3 gm/cc

41. A fusion reaction takes place at very high temperature because

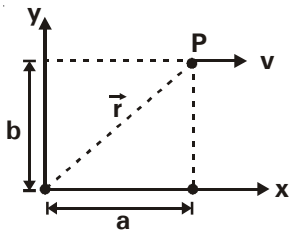
(1) atoms get ionized at high temperature

(2) molecules get decomposed at high temperature

(3) nuclei get decomposed at high temperature

(4) due to their high energy nuclei overcome their mutual electrostatic repulsion and combine

42. A particle P of mass m is moving along a straight line parallel to x-axis with constant velocity. Find angular momentum about the origin in vector form



(1) $+ mv^2b\hat{k}$

(2) $-mvb\hat{k}$

(3) $-2mv\ b\hat{k}$

(4) $-mvb\hat{j}$

43. A Container having 1 mole of a diatomic gas at a temperature 27°C has a movable piston which maintains at constant pressure in container of 1 atm. The gas is heated until temperature becomes 127°C. The work done is

(1) 703 J
(2) 831 J
(3) 121 J
(4) 2035 J

44. An earth satellite of mass 'm' revolves in a circular orbit at a height 'h' from the surface of the earth. R is the radius of the earth and 'g' is acceleration due to gravity at the surface of the earth. The velocity of the satellite in the orbit is given by

(1) $\frac{gR^2}{R+h}$

(2) gR

(3) $\frac{gR}{R+h}$

(4) $\sqrt{\frac{gR^2}{R+h}}$

45. A Carnot engine working between 300 K and 500K has work output of 600 J per cycle. What is amount of heat energy supplied to the engine from source per cycle?

(1) 1500 J
(2) 1200 J
(3) 2000 J
(4) 1600 J

46. **Statement-I** : A photon of higher energy has higher velocity.

Statement-II : Davission and Germer experiment proved wave nature of electron

(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

47. A force of 1 N displaces a body A by 1 metre. Another force of 1 N acts on a body B for 1second. If both the bodies are of 1 kg each, then kinetic energy attained by

(1) A is more
(2) B is more
(3) both A and B is same
(4) A is half of B

48. In an amplifier with a 10% positive feedback, the apparent gain in voltage is found to be 90. What is the true gain in voltage for this amplifier?

(1) 60
(2) 45
(3) 9
(4) 15

49. If the current in electric bulb decreases by 10% and resistance does not change, then the power in the bulb decreases by

(1) 10%
(2) 21%
(3) 20%
(4) 19%

50. Three photo diodes D_1, D_2 and D_3 are made of semiconductors having band gaps of 2.5 eV, 2 eV and 3 eV, respectively. Which ones will be able to detect light of wavelength 6000 Å ?

(1) D_1
(2) D_2
(3) D_3
(4) All of these

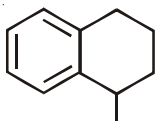
CHEMISTRY : SECTION-A

All questions are compulsory in section A

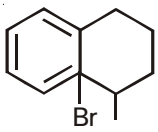
51. Photoelectric effect was not observed for
(1) Potassium
(2) Rubidium
(3) Lithium
(4) Caesium

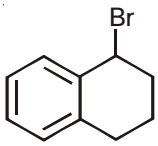
52. An open beaker of capacity 'V' litres contains air at T_1K. The beaker is heated to a temperature T_2 so that amount of gas escaping out is one-third of the amount of gas finally left in beaker. Then
(1) $T_2 = \frac{3}{4} T_1$
(2) $T_2 = 3T_1$
(3) $T_2 = \frac{4}{3} T_1$
(4) $T_2 = \frac{1}{3} T_1$

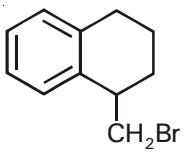
53. The time required for completion of zero order reaction is
(1) $\frac{[A_0]}{k}$
(2) $\frac{[A_0]}{2k}$
(3) $\frac{0.693}{k}$
(4) infinite

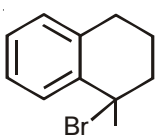
54.  + Br_2 $\xrightarrow{h\nu}$ (1mole)

Which of the following is the major product of the reaction given above?

(1) 

(2) 

(3) 

(4) 

55. Number of atoms present in 52 amu of He is
(1) 13
(2) 13 N_A
(3) N_A
(4) $N_A/4$

56. Addition of halogens to alkenes is an example of electrophilic addition reaction involving
(1) cyclic halonium ion formation
(2) carbocation
(3) carbanion
(4) carbene

57. Which has maximum pH ?
(1) 0.01 M H_2SO_4
(2) 0.01 M HCl
(3) 0.01 M $Ba(OH)_2$
(4) 0.01 M KOH

58. In sulphonation of benzene
(1) SO_3 acts as an electrophile.
(2) SO_3 acts as a nucleophile.
(3) SO_2 acts as an electrophile.
(4) HSO_4^- acts as an electrophile.

59. Boron is unable to form BF_6^{3-} ion because
(1) boron can have a maximum covalency of four
(2) boron is large in size and can not accomodate six F^- ions around it
(3) Boron can have a maximum covalency of eight
(4) Boron is a non metal and can not react with F^-

60. Given :

$S + O_2 \rightarrow SO_2$; ($\Delta H = -298.2$)

$SO_2 + \frac{1}{2} O_2 \rightarrow SO_3$; ($\Delta H = -98.2$)

$SO_3 + H_2O \rightarrow H_2SO_4$; ($\Delta H = -130.2$)

$H_2 + \frac{1}{2} O_2 \rightarrow H_2O$; ($\Delta H = -287.3$)

Then enthalpy of formation of H_2SO_4 at 298 K is
(1) –813.9 kJ
(2) –650.3 kJ
(3) +320.5 kJ
(4) – 433.7 kJ

61. A redox couple is
(1) oxidation half cell and reduction half cell
(2) having together the oxidised and reduced forms of a substance taking part in an oxidation or reduction half reaction
(3) a salt bridge which connects the two half cells
(4) a cell in which oxidising agent and reducing agent is coupled

62. Ratio of sigma and pi bonds is same in which of the following compounds
(1) $(CN)_2$
(2) CO_2
(3) C_6H_6
(4) C_2H_4

63. The number of asymmetric carbons is maximum is
(1) α -D-glucopyranose
(2) α -D-fructofuranose
(3) β -D-fructofuranose
(4) Open chain form of D-glucose

64. The oxidation state of chromium in chromate and dichromate ion is respectively
(1) +6, +5
(2) +5, +6
(3) +6, +6
(4) +6, +3

65. Compound which is added to soap to impart antiseptic properties is
(1) sodium laurylsulphate
(2) sodium dodecylbenzenesulphonate
(3) rosin
(4) bithional

66. Which one of the following undergoes reaction with 50% sodium hydroxide solution to give the corresponding alcohol and acid ?
(1) Phenol
(2) Benzaldehyde
(3) Butanal
(4) Benzoic acid

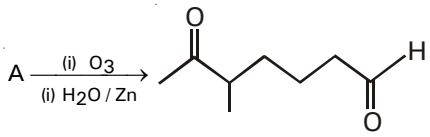
67. A compound undergoes tetramerisation in an organic solvent vant Hoff's factor is
(1) 1.0
(2) 0.33
(3) 0.5
(4) 0.25

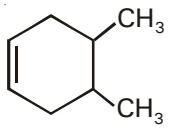
68. The blue colour of the solution of alkali metals in liquid ammonia is due to
(1) ammoniated cations
(2) ammoniated electrons
(3) both (1) & (2)
(4) ammoniated atoms

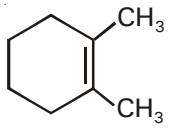
69. Which of the following represents chelating ligand?
(1) Cl^-
(2) Ox
(3) OH^-
(4) H_2O

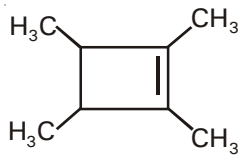
70. **Statement-I** : If the concentration of dissolved oxygen of water is below 6 ppm, the growth of fish gets inhibited.
Statement-II : The amount of oxygen required by bacteria to break down the organic matter present in a certain volume of a sample of water, is called Biochemical Oxygen Demand .
(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

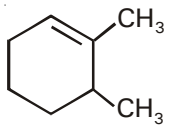
71. What is A in the following reaction



(1) 

(2) 

(3) 

(4) 

72. Geometrical isomerism can exist in which of the following compound?
(1) $CH_3-C(CH_3)=CH_2-CH_2-CH_3$
(2) $CH_3-CH=CH-CH_3$
(3) $CH_3CH=CH_2$
(4) $ClCH_2-CH_2Cl$

73. In which of the following five 3d-orbital are degenerate?
(1) $Co^{3+}(g)$
(2) $Co^{3+}(aq)$
(3) $[Co(NH_3)_6]^{3+}$
(4) $[Co(CN)_6]^{3-}$

74. **Assertion** : $R_3P=O$ exist but $R_3N=O$ does not (R = alkyl group)
Reason : Besides restricting its covalency to four, nitrogen cannot form $d\pi - p\pi$ bond as the heavier elements can.
(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

75. Which of the following statements is wrong?

(1) An acidified solution of $K_2Cr_2O_7$ liberates iodine from iodides

(2) In acidic solution dichromate ions are converted to chromate ions

(3) Ammonium dichromate on heating undergoes decomposition to give Cr_2O_3

(4) Potassium dichromate is used as a titrant for Fe^{2+} ions

76. ΔG for the formation of Cr_2O_3 is -540 KJ mol^{-1} and that of Al_2O_3 is -827 KJ mol^{-1}. The correct statement is

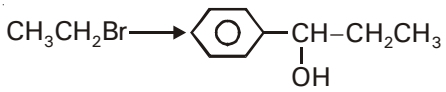
(1) reduction of Cr_2O_3 is possible with aluminimum

(2) reduction of Al_2O_3 is possible with Cr

(3) Al can act as oxidising agent for Cr_2O_3

(4) Cr can act as reducing agent for Al_2O_3

77. The correct set of reagents required to bring about the following conversion is



(1) Mg/Ether ; C_6H_5CHO ; H_3O^+

(2) Mg/Ether ; $C_6H_5CH_2OH$

(3) Mg/Ether ; $C_6H_5COCH_3$; H_3O^+

(4) KOH(aq) ; C_6H_5COOH/H^+

78. Which of the following statements is incorrect regarding the compounds of carbon family

(1) maximum coordination number of carbon in commonly occurring compounds is 4, whereas that of silicon is 6

(2) the order of boiling point of hydrides of group 14 element is
$CH_4 < SiH_4 < GeH_4 < SnH_4$

(3) the order of reducing character of hydrides is
$CH_4 > SiH_4 > GeH_4 > SnH_4 > PbH_4$

(4) the order of thermal stability of hydrides is
$CH_4 < SiH_4 < GeH_4 < SnH_4 < PbH_4$

79. Which of the following is less for 0.1M solution with respect to 1M solution?

(1) Molar conductance

(2) Equivalent conductance

(3) Specific conductance

(4) None of these

80. The boiling point of which of the following is maximum

(1) Acetic acid

(2) Propan-1-ol

(3) Acetone

(4) Methyl ethyl ether

81. Thermal decomposition of barium azide produces very pure

(1) O_2

(2) N_2

(3) NH_3

(4) N_3H

82. How many statement(s) is/are correct about working of a Daniell cell?

a. If the circuit is open, then the following reaction takes place
$Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$

b. Voltage of the cell (as read on the voltmeter) keeps on decreasing.

c. After some time, there is no change in the concentration of Cu^{2+} and Zn^{2+} ions which indicates equilibrium.

d. At equilibrium voltmeter gives negative reading.

(1) Three

(2) Two

(3) One

(4) Four

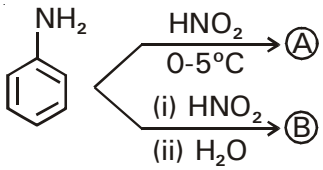
83. Which of the following will not show free radical polymerisation?

(1) $CH_2 = CH_2$

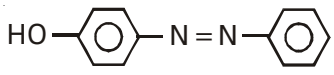
(2) $CH_3-CH = CH_2$

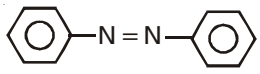
(3) $CH_2 = CH-Cl$

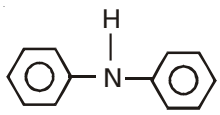
(4) $H_2N-(CH_2)_5-COOH$

84. 

Product of reaction of Ⓐ and Ⓑ in basic medium (pH = 9 – 10) is

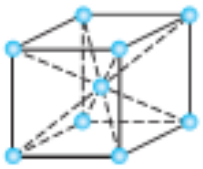
(1) 

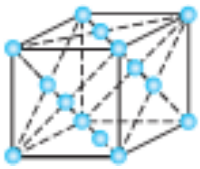
(2) 

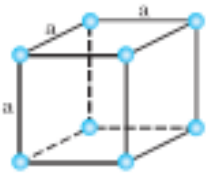
(3) 

(4) No reaction occurs

85. Match the types of cubic lattices in column-I with their shapes in column-II.

a. Body-centred p. 

b. Face-centred q. 

c. Primitive r. 

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

CHEMISTRY : SECTION-B

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

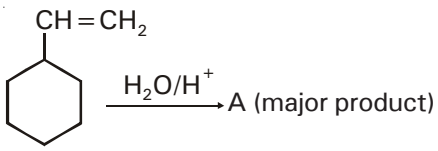
86. Which of the following acid is used for acidification of sodium extract for testing sulphur by lead acetate test ?
(1) CH_3COOH
(2) H_2SO_4
(3) HNO_3
(4) HI

87. Match the reactions given in column-I with the statements given in column-II

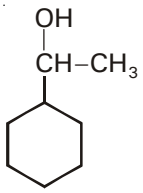
Column-I	Column-II
a. Ammonolysis	i. Amine with lesser number of carbon atoms
b. Gabriel phthalimide synthesis	ii. Detector test for primary amines
c. Hoffmann Bromamide	iii. Reaction of phthalimide with KOH and R–X
d. Carbylamine reaction	iv. Reaction of alkylhalides with NH_3

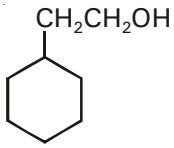
(1) a-iv, b-iii, c-i, d-ii
(2) a-ii, b-i, c-iii, d-iv
(3) a-i, b-ii, c-iii, d-iv
(4) a-iii, b-i, c-iv, d-ii

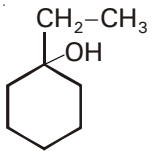
88. Bronze is an alloy of
(1) Cu
(2) Sn
(3) Ni
(4) Both (1) & (2)

89. 

In the above reaction, the product A is

(1) 

(2) 

(3) 

(4) Both (1) & (2)

90. Which of the following paramagnetic complex with +2 oxidation state of central metal shows geometrical isomerism
(1) $[Ni(en)_3]Cl_2$
(2) $[Cr(en)_2(NO_2)_2]Cl$
(3) $[Zn(NH_3)_2Cl_2]$
(4) $[Co(NH_3)_4(H_2O)_2]Cl_2$

91. **Assertion** : Sandmeyer and Gatterman's reaction helps in the formation of chlorobenzene.

Reason : Chlorobenzene is lesser reactive than benzene for the attack of electrophile.

(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. For the redox reaction
$Zn(s) + Cu^{2+}(0.1M) \rightarrow Zn^{2+}(1\ M) + Cu(s)$ taking place in a cell, E^0_{cell} is 1.10 volt. E_{cell} for the cell will be
(1) 2.14 volt
(2) 1.80 volt
(3) 1.07 volt
(4) 0.82 volt

93. The mass of sodium acetate(CH_3COONa) required to make 500 mL of 0.375 molar aqueous solution. (Molar mass of sodium acetate is 82.0245 g mol^{-1}).
(1) 15.38
(2) 153.8
(3) 10.3
(4) 1.5

94. Which of the following is not the correct match for the use of the given substances?
(1) Liquid N_2 — refrigerant to preserve biological materials
(2) Ozone — Germicide; disinfectant
(3) Chlorine — Bleaching agent for woodpulp
(4) Neon — Used for filling balloons for me teorological observations

95. Information regarding three molecules A, B and C is given below
a. each of the molecule B and C have as much of s-character as d-character
b. molecule A has no angle at 180°, but molecule B and C have angle at 180°
c. two of the molecules have same number of directional orbitals of central atom after hybridisation.
Based on above information the hybrid state of central atom A, B and C can be
(1) sp^3, sp^3d, dsp^2
(2) sp^3d^2, sp^3d, dsp^3
(3) sp^3, sp^2, sp^3
(4) sp^3, sp^3d, sp^2

96. **Statement-I** : During S_{N^2} mechanism, bulky alkyl groups hinder the approach of nucleophile.
Statement-II : S_{N^2} occurs with racemisation.
(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

97. What is true about classical smog?
(1) It contains NO_2
(2) It is formed in early hours of winter months
(3) It is oxidising in nature
(4) It is formed in early hours of summer months

98. The temperature coefficient of a reaction is 2. The rate of this reaction, on raising the temperature by 15°, shall increase approximately by
(1) 3.2 times
(2) 2.8 times
(3) 5.6 times
(4) 4.2 times

99. Which of the following on the addition will cause intensity of deep red colour to decrease?

$$\underset{\text{Pale yellow}}{Fe^{3+}(aq)} + \underset{\text{colourless}}{SCN^-} \rightleftharpoons \underset{\text{deep red}}{Fe(SCN)^{2+}(aq)}$$

(1) $FeCl_3$
(2) KSCN
(3) $H_2C_2O_4$(oxalic acid)
(4) All of these

100. a. Bi_2S_3 ($K_{sp} = 1.08 \times 10^{-68}$)
b. MnS ($K_{sp} = 9 \times 10^{-16}$)
c. Ag_2S ($K_{sp} = 4 \times 10^{-51}$)
Correct order of solubility of the above salts is
(1) a > b > c
(2) b > a > c
(3) c > a > b
(4) b > c > a

ZOOLOGY : SECTION-A

All questions are compulsory in section A

101. Best stage to observe shape, size and number of chromosomes is
(1) metaphase
(2) interphase
(3) prophase
(4) telophase

102. rRNA is actively synthesised in
(1) nucleoplasm
(2) lysosomes
(3) ribosomes
(4) nucleolus

103. The lowest concentration of nitrogenous waste may be found in blood passing through
(1) pulmonary artery
(2) renal artery
(3) renal vein
(4) hepatic vein

104. *EcoR I* always cut DNA molecules at a particular point by recognizing a specific sequence between
(1) G and A
(2) T and C
(3) A and A
(4) T and T

105. Mark, among the following a cell which does not exhibit phagocytotic activity
(1) Monocytes
(2) Neutrophil
(3) Basophil
(4) Macrophage

106. Main arena of cellular activities is
(1) cytoplasm
(2) nucellus
(3) nucleoplasm
(4) lysosomes

107. Structure common between Earthworm and Cockroach is
(1) Nephridia
(2) Ommatidia
(3) Dorsal nerve cord
(4) Ventral nerve cord

108. Yeast used for fermenting malted cereals & fruit juices to obtain ethanol is
(1) Brewer's yeast
(2) *Monascus purpureus*
(3) *Trichoderma*
(4) *Aspergillus*

109. Choose the incorrect option
(1) Rudolf Virchow (1855) gave the statement "omnis cellula e cellula"
(2) Schielden and Schwann proposed that bodies of animal and plants are composed of cell and products of cells
(3) 70S and 80S ribosomes are present in cytoplasm of eukaryotes
(4) 70S ribosomes are present in prokaryotes and eukaryotes

110. Stickiness of the ends facilitate the action of
(1) DNA ligase
(2) DNA polymerase
(3) molecular scissors
(4) Both (1) and (3)

111. Homopolymers of glucose are
(1) Starch, Chitin, Glycogen
(2) Cellulose, Inulin, Chitin
(3) Starch, Cellulose, Glycogen
(4) Glycogen, Chitin, Inulin

112. The bile duct and pancreatic duct open together in duodenum as hepatopancreatic duct which is guarded by sphincter called
(1) Sphincter of Boyden
(2) Sphincter of oddi
(3) Pyloric sphincter
(4) Gastroesophageal sphincter

113. One of the following is not a property of cancerous cells
(1) compete with normal cells for vital nutrients
(2) show metastasis
(3) show contact inhibition
(4) divide in an uncontrolled manner

114. The hormones produced in women only during pregnancy are
(1) Relaxin, hCG, progesterone
(2) hCG, progesterone, oxytocin
(3) hpL, oxytocin, LH
(4) hCG, hpL, relaxin

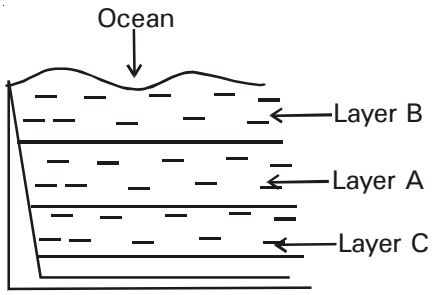
115. What is true for compound epithelium?
a. It is multilayered
b. Has a limited role in absorption & secretion
c. Provides protection against chemical & mechanical stresses
d. Cover dry surface of skin & moist surface of pharynx & buccal cavity
e. Lines the ducts of salivary glands
(1) a, b & d
(2) b, c & d
(3) c, d & e
(4) a, b, c, d & e

116. Which of the following is not an example of biopesticide?
(1) *Trichoderma*
(2) *Nucleopolyhedrovirus*
(3) *Bacillus thrungienesis*
(4) *Monascus Purpureus*

117. Nissl's bodies are mainly composed of
(1) Proteins and lipids
(2) DNA and RNA
(3) Free ribosomes and RER
(4) Nucleic acids and SER

118. A colony of bacteria growing on a given medium has built in variation in terms of ability to utilise a feed component. A change in medium composition would
(1) eliminate the bacterial colony
(2) bring out only that part of population that can survive under these changed conditions
(3) cause the formation of spores in bacterial colony
(4) have no effect at all on the bacterial colony

119. The diagram below shows undisturbed sedimentary strata at the botton of an ocean. The fossils found in layer B resemble the fossils founds in layer A.The similarity suggests that



(1) the fossils in layer B were formed before the fossils in layer A
(2) modern forms of life may have evolved from earlier forms of life
(3) the fossils in layer C must be more complex than those in layer A
(4) only vertebrate fossils are found in sediments

120. **Assertion**: The abnormal frequency of bowel movement and increased liquidity of the faecal discharge is known as constipation.
Reason : Constipation reduces the absorption of food.
(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

121. How many organisms in the list given below are mammals ?
Hyla, Chelone, Corvus, Pteropus, Equus, Balaenoptera, Neophron
(1) four
(2) six
(3) three
(4) five

122. Most abundant protein in the whole of the biosphere and most abundant organic compounds in living cells are respectively
(1) Collagen, Rubisco
(2) Rubisco, Proteins
(3) Collagen, Carbohydrates
(4) Rubisco, Carbohydrates

123. Secretion of which of the following structure maintains inner wall of uterus for implantation?
(1) Oviduct
(2) Pituitary gland
(3) Corpus luteum
(4) Ovarian follicle

124. Which of the following statements is not true?
(1) Red muscle fibres are slower in contraction rate
(2) White muscle fibres possess few mitochondria
(3) Red muscle fibres have high amount of sarcoplasmic reticulum
(4) Smooth muscle fibres are held together by gap junctions and are bundled together in a connective tissue sheath.

125. Genetically modified plants have been useful in many ways except
(1) made the crops more tolerant to abiotic stress
(2) decreased efficiency of mineral usage by plants
(3) help to reduce post harvest losses
(4) enhance nutritional value of food

126. Match column-I with column-II

	Column-I		**Column-II**
a.	*Scoliodon*	i.	Sting ray
b.	*Pristis*	ii.	Great white shark
c.	*Carcharodon*	iii.	Saw fish
d.	*Trygon*	iv.	Dog fish

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

127. Identify the diagram and features applicable to the organism

(1) *Aurelia* and medusa stage
(2) *Aurelia* and polyp stage
(3) *Adamsia* and polyp stage
(4) *Adamsia* and medusa stage

128. Which of the following in not a vertebrate ?
(1) *Pristis*
(2) *Petromyzon*
(3) *Hyla*
(4) *Amphioxus*

129. How many of the following statements are true?
a. Muscle cell is the anatomical unit of muscle
b. Visceral muscles are branched in nature
c. Cartilaginous joints play significant role in locomotion
d. Head of myosin contains ATP binding sites and ATPase activity
e. The last two pairs of ribs are also called vertebrochondral ribs
(1) 2
(2) 3
(3) 4
(4) 1

130. First movement of foetus and appearance of hair on head is usually observed during
(1) 5th month
(2) 1st and 2nd trimester respectively
(3) 3rd trimester
(4) 1st month of 2nd trimester

131. A doctor recommended a person to undergo Widal test. What symptoms a doctor had noticed in patient before advicing him to go for test?
(1) Sustained high fever and stomach pain
(2) Fever, chill and cough
(3) Nasal congestion and sore throat
(4) All of the above

132. **Statement- I** : Female who has undergone hystrectomy can give birth to her own genetic baby.
Statement- II : Female after hystrectomy can produce ova.
(1) Both statement-I and statement-II are incorrect
(2) Both statement -I and statement- II are correct
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement- II is correct

133. How many of the following are incorrect statement?
a. CT scanning uses non-ionising radiations like X-rays to generate 3D image of the internals of an object
b. MRI uses magnetic fields and ionising radiations to detect pathological changes in the living tissue
c. AIDS patients become susceptible to infections from *Mycobacterium* and *Toxoplasma*
d. Vaccines generate memory T cells but not the memory B cells
(1) one
(2) two
(3) three
(4) four

134. Crossing over occurs between
(1) sister chromatids of given chromosome
(2) non-sister chromatids of non-homologous chromosomes
(3) sister chromatids of homologous chromosomes
(4) non-sister chromatids of homologous chromosomes

135. When cell has stalled DNA replication fork, which checkpoint should be predominantly activated?
(1) G_1/S
(2) G_2 /M
(3) M D.
(4) Both G_2 /M and M

ZOOLOGY : SECTION-B

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

136. Which among the following is incorrect?
(1) The normal *E.coli* cells do not carry resistance against kanamycin, ampicillin and tetracycine antibiotics
(2) Rop codes for proteins involved in replication of plasmid
(3) Selectable marker, selectively permits the growth of the transformants
(4) pBR 322 is a plasmid obtained from *Proteus bulgaris*

137. Condition not applicable to cell in living state is
(1) equilibrium state
(2) steady state
(3) metabolic flux
(4) Dyamic state

138. The volume of air left in the lungs even after maximum forceful expiration is
(1) 800-1000 ml
(2) 2000-3000 ml
(3) 1100-1200 ml
(4) 3000 ml

139. Match column-I and column-II

Column-I	Column-II
i. S-phase	a. Proteins are synthesized in preparation for mitosis
ii. G_2-phase	b. Inactive stage but cell metabolically active
iii. G_1-phase	c. Centriole duplication
iv. G_0-phase	d. RNA, protein synthesis, ER and golgi duplication

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

140. Selects the correct matching in the following pairs
(1) Glucagon –Hypoglycemic, gluconeogenesis
(2) Catecholamines–glycogenolysis, proteotysis
(3) Cortisol–promotes cellular uptake and utilistion of aminoacids
(4) Thymosin–sleep wake cycle, defense capability

141. Which of the following is not a connotation of special creation?
(1) All living organisms were created as such
(2) Diversity was always same since creation and will be same in future also
(3) Earth is 4000 years old
(4) Existing living forms share similarities to varying degree not only among themselves but also with life forms that existed millions of years ago

142. **Assertion :** A defect in the chordae tendinae attached to the bicuspid valve will lead to reduced blood supply to the body cells.
Reason : Chordae tendinae prevent the flaps of bicuspid valve from everting into the right atrium, thus preventing backflow of blood from left ventricle.
(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

143. Choose the correct set :

	Phylum	Coelom	Distinctive Features
(1)	Annelida	Pseudocoelom	Chitinous exoskeleton
(2)	Aschelminthes	Coelomate	Elongated worm shaped body
(3)	Porifera	Absent	Gastrovascular cavity
(4)	Echinodermata	Coelomate	Water vascular system

144. Which on of the following events is correctly matched with the time period in a normal menstrual cycle?
(1) release of egg : 5th day
(2) endometrium regenerates : 5-10 days
(3) endometrium secretes nutrients for implantation : 1-5 days
(4) rise in progesterone level : 1-15 days

145. **Statement-I** : Corpora quadrigemina is present on dorsal side of midbrain.
Statement-II : Midbrain receives and integrates auditory, visual and tactile inputs.
(1) Statement-I is correct but statement-II is incorrect
(2) Both statement-I and statement-II are incorrect
(3) Both statement-I and statement-II are correct
(4) Statement-I is incorrect but statement-II is correct

146. A doctor while operating on a patient in emergency accidentally cuts himself with a scalpel. Later it is found the patient is HIV positive. To rule out whether doctor contracted the virus, which test should be done before the symptoms appear?
(1) PCR
(2) Radiography
(3) Routine blood examination
(4) none of these

147. If a person is passing out large amount of urine and feeling thirsty, yet his urine has no glucose, then the cause of excessive micturition can be
(1) oversecretion of anterior pituitary hormone
(2) undersecretion of a hormone from pancreas
(3) undersecretion of a posterior pituitary hormone
(4) oversecretion of a hormone from pancreas

148. Which of the following glucose transporters is insulin-dependent?
(1) GLUT I
(2) GLUT II
(3) GLUT III
(4) GLUT IV

149. A female athlete is accused by her competitors of misusing drugs to enhance her performance. What changes were noticed in the athlete for her competitors to have made such an accusation?
(1) Decrease pitch of her voice
(2) Excessive hair growth on face and body
(3) Aggressive behaviour
(4) All of these

150. Cortex extends in between medullary pyramids and is called
(1) Renal column of Malpighs
(2) Renal column of Bertini
(3) Malpighian body
(4) Malpighian tubule

BOTANY : SECTION-A

All questions are compulsory in section A

151. Which of the following are monoecious plants?
(1) Maize and Papaya
(2) Cucurbits and Coconuts
(3) Coconuts and date Palm
(4) Castor and Papaya

152. A brief exposure to extremely high sound level generated by take-off of a jet plane or rocket, may damage ear drums. This sound level is of the order
(1) 150 dB or more
(2) 120 dB or more
(3) 70 dB or more
(4) 105 dB or more

153. Which of the following rRNAs are present in the larger subunit of ribosome in prokaryotes and has catalytic function ?
(1) 18 S
(2) 28 S
(3) 23 S
(4) 5 S

154. Which statement is FALSE w.r.t. RuBisCO?
(1) It is the most abundant enzyme in the world
(2) Its active site can bind to both CO_2 and O_2
(3) It has much greater affinity for O_2 than for CO_2
(4) Relative concentration of O_2 and CO_2 determines which will bind to the enzyme

155. Which of the following statement is correct?
(1) Salt concentration is less than 5ppt in inland water
(2) In terrestrial environment ; sediment characteristics determine the type of benthic animals that can thrive there
(3) Temperature is not most ecological relevant environmental factor
(4) Mango tree can grow in temperate countries like Canada and Germany

156. Identify the incorrect match
(1) Mosses – *Sphagnum*, *Funaria*
(2) Ferns – *Dryopteris, Selaginella*
(3) Conifers – *Pinus, Cedrus*
(4) Algae – *Udorina, Laminaria*

157. Dicot leaf differ from monocot leaf in having
(1) parallel venation
(2) palisade and spongy parenchyma
(3) stomata only on upper side
(4) equal stomata both on upper, lower sides

158. Which one of the following statements is correct?
(1) Majority of animals and nearly all plants are regulators.
(2) Small animals are commonly found in polar regions.
(3) Regulators are able to maintain their internal environment constant despite of varying external environmental conditions.
(4) Migration is a way to avoid the stress by escaping in time.

159. **Assertion** : Temperature is a very important enviornmental factor
Reason : Temperature affects the kinetics of enzymes.
(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

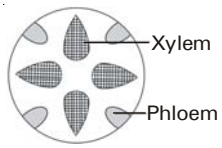
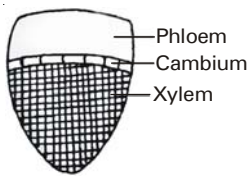
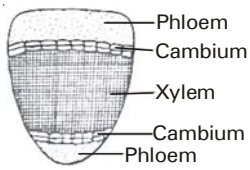
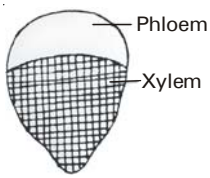
160. Select the correct formula w.r.t. Pea
(1) $Br \oplus \male P_{3+3}\, A_{3+3}\, \underline{G}_{(3)}$
(2) $\% \male K_{(5)}\, C_{1+2+(2)}\, A_{(9)+1} + \underline{G}_1$
(3) $\oplus \male K_4\, C_{2+2}\, A_{2+4} + \underline{G}_{(2)}$
(4) $Ebr \oplus \male K_{(5)} G_{(5)}\, A_5\, \underline{G}_{(2)}$

161. Which of the following statement is incorrect?
(1) Mendel discovered linkage in pea.
(2) Mendel Coined the term Genetics for the science of heredity
(3) Law of segregation in Mendelian Genetics is considered as universal
(4) Linkage works against the law of independent assortment .

162. During DNA fingerprinting, firstly _____ is isolated & digested by _____ to gain the fragments. These are seperated by _____ technique. After blotting the fragments are labelled with _____ and further studies by _____. Correct fillup are respectively
(1) DNA; restriction endonucleases; electrophoresis; probes; autoradiography
(2) DNA; electrophoresis, probes; VNTR's; X-Ray film
(3) Cell; electrophoresis, probes; VNTR's; X-Ray film
(4) Nucleus; alkaline solution; autoradiography, probes, electrophoresis

163. Five closely related species of warblers living on same tree, showed co-existence"due to
(1) interferencecompetition
(2) competitive release
(3) resource partitioning
(4) competitive Exclusion

164. Match Column-I diagram with type of vascular bundles

Column-I		Column-II
a.		i. Conjoint close
b.		ii. Collateral open
c.		iii. Radial
d.		iv. Bicollateral

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

165. Which of the following is **False**?
(1) A much larger fraction of energy flows through the DFC than through GFC in terrestrial ecosystem.
(2) Length of food chain is generally limited to 3-4 trophic levels.
(3) The annual net primary productivity of whole biosphere is approximately 70 billion tonnes of organic matter.
(4) Decomposition rate is slower if detritus is rich in chitin

166. Which of the following statement is incorrect?
(1) Amount of living biomass present in ecosystem is standing state.
(2) Measurement of biomass is generally done in terms of dry weight
(3) Temperature and soil moisture are important climatic factors that regulate the process of decomposition.
(4) Warm and moist environment favour decomposition whereas low temperature and anaerobiosis inhibit decomposition.

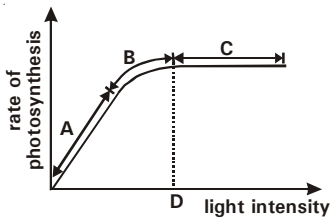
167. 

Figure shows effect of light on rate of photosynthesis. At which point in curve is light is a 100% limiting factor?
(1) B & C (2) A only
(3) A & B (4) C & D

168. Which of the following statement is correct w.r.t.egg apparatus ?
(1) It has two polar nuclei and one egg cell
(2) It has two antipodal cells and polar nucleus
(3) It has two haploid synergids and one egg cell
(4) It has two diploid synergids and one egg cell

169. Organisms showing cellular grade of organisation with non cellulosic cell wall are placed In which of the following Kingdom ?
(1) Protista (2) Fungi
(3) Plantae (4) Monera

170. Which is incorrect about C_4 plants?
(1) They have a special type of leaf anatomy
(2) They show a response to highlight intensities
(3) They do not tolerate high temperature
(4) They lack photorespiration process and have greater productivity of biomass

171. In $\frac{dN}{dt} = rN\left(\frac{K-N}{K}\right)$, what does $\left(\frac{K-N}{K}\right)$ represent?
(1) Carrying capacity
(2) Environmental resistance
(3) Biotic potential
(4) Growth rate

172. Classify the following statements as true or false and choose the correct option
a. The distance between each base pair in a DNA double helix is approximately equal to 0.034 nm
b. The central dogma in molecular biology which states that information flows from DNA $\rightarrow$ RNA $\rightarrow$ Protein was proposed by Francois Jacob.
c. The average rate of polymerisation of deoxyribonucleotides in *E. coli* is 2000 base pair per second.
d. The principle of complementarity governs the process of replication but not transcription.
(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–F, b–F, c–T, d–F

173. Which is incorrect w.r.t. electron transport system (ETS)?
(1) It is metabolic pathway through which the electron passes from one carrier to another
(2) It is present in the mitochondrial matrix
(3) Electrons from NADH produced in the mitochondrial matrix during citric acid cycle are oxidised
(4) Ubiquinone receives reducing equivalents via $FADH_2$

174. Which adaptation is correctly matched?
(1) Anemophily – Large and sticky pollens
(2) Hydrophily – abundant nectar
(3) Entomophily – safe place to lay eggs
(4) Ornithophily – nectarless & fragrant flowers

175. What would be the number of double homozygous individuals in F_2 generation of a dihybrid cross if the total progeny is 3200?
(1) 1600
(2) 200
(3) 800
(4) 2400

176. **Statement-I** : Alleles are slightly different forms of same gene.
Statement-II : A homozygous individual has both alleles similar.
(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

177. Variety of Okra resistant to shoot and fruit borer is
(1) Pusa A–4
(2) Pusa Gaurav
(3) Pusa sem-2
(4) Pusa sem-3

178. A common symptom caused by the deficiency of K, Ca, Cu, Mg is
(1) delayed flowering
(2) chlorosis
(3) appearance of dead necrotic areas
(4) inhibition of cell division

179. Euchromatin is
(1) highly coiled and condensed even at interphase
(2) inert
(3) involved in transcription
(4) found in telomeres and pericentromeric region

180. Which phytohormone is used for initiating roots in stem cuttings?
(1) Auxin
(2) Cytokinin
(3) Ethylene
(4) Gibberellin

181. China rose, tomato, pea, lemon, mustard, argemone, prim rose
How many of the above have axile placentation?
(1) 3
(2) 4
(3) 5
(4) 2

182. Which is correctly matched with international efforts to conserve biodiversity?
(1) World Summit held in Rio de Janeiro
(2) Earth Summit held in Kyoto.
(3) Earth Summit in Montreal.
(4) Earth Summit held in Rio de Janeiro.

183. Which statement is incorrect with respect to angiospermic seed?
(1) Endosperm is triploid
(2) Embryo may have one, two or more cotyledons
(3) Seed may be produced without fertilization in some species of Asteraceae and grasses
(4) Persistent nucellus is called perisperm

184. One of the following is very simple in structure but complex in behaviour
(1) Slime mould
(2) *Amoeba*
(3) Bacteria
(4) *Albugo*

185. Which of the following statements is correct?
(1) In binomial nomenclature , specific epithet starts with a capital letter
(2) Key is a quick referral system.
(3) Two or more related orders are placed in same family
(4) Growth is not an defining feature of an living organisms

BOTANY : SECTION-B

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

186. Following is not a diploid structure.
(1) Nucellus of angiosperm ovule.
(2) Endosperm of gymnosperm seed
(3) Sporophyte of ferns
(4) Megaspore mother cell in angiosperms.

187. **Statement-I** : RNA is a genetic material in some viruses.
Statement-II : Transformation experiment was done by Griffith in bacteriophage.
(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

188. Which is incorrect with respect to humus?
(1) It is a dark coloured amorphous substance
(2) It is highly resistant to microbial action
(3) It undergoes decomposition at an extremely fast rate
(4) Being colloidal in nature it serves as a reservoir of nutrients

189. Chilling treatment in biennials such as sugar beet can be replaced by
(1) Ethylene
(2) Auxin
(3) Gibberellins
(4) Cytokinins

190. Match the following

Column-I		Column-II	
a.	Virion	i.	only protein coat
b.	Virus	ii.	only RNA
c.	Prion	iii.	inert virus
d.	Viroid	iv.	either DNA or RNAs

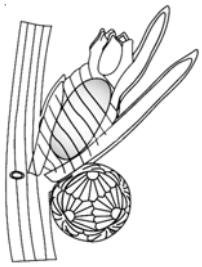
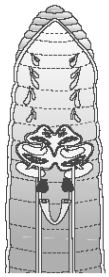
(1) (a-iii), (b-iv), (c-i), (d-ii)
(2) (a-ii), (b-iv), (c-i), (d-iii)
(3) (a-iii), (b-ii), (c-i), (d-iv)
(4) (a-i), (b-iv), (c-iii), (d-ii)

191. If one goes in any high altitude place (< 3500 m), one experiences altitude sickness. Which of the following is not the solution adopted by the human body?
(1) By increasing red blood cell production
(2) By decreasing red blood cell production
(3) By decreasing binding affinity of haemoglobin
(4) By increasing breathing rate

192. Classify the following statements as true or false and choose the correct option
a. Collection of variability is the first step of any crop breeding programme.
b. Pusa sadabahar is a variety of cowpea.
c. In Mung bean, resistance to yellow mosaic virus & powdery mildew were induced by hybridization.
d. The conventional method of breeding for disease resistance are hybridisation and selection.
(1) a–T, b–T, c–F, d–T
(2) a–T, b–F, c–F, d–T
(3) a–F, b–T, c–F, d–T
(4) a–T, b–F, c–T, d–F

193. Which is correct w.r.t. gymnosperms ?
(1) Seat of sexual reproduction is flower
(2) Pollen represent male sporophyte
(3) Ovules are formed inside ovary
(4) Roots may be associated with mycorrhiza.

194. Identify the following diagrams

a. 
b. 
c. 
d. 

(1) a–conidia of *Penicillium*, c–leaf buds of *Bryophyllum*
(2) d–unisexual animal, Earthworm, b–dioecious plant of *Equisetum*
(3) b–monoecious plant of *Chara*, c-Terror of Bengal
(4) b–dioecious plant of *Chara,* d–Bisexual animal earthworm

195. Polytene chromosomes can be found in
(1) salivary glands of larve of certain insects
(2) amphibious oocytes
(3) sperm cells of human
(4) yolk rich oocyte

196. "The process of plamolysis is usually _____. When the cells are placed in a _____solution, water diffuses into the cell causing the _____ to build up a pressure against the wall, that is called turgor pressure. The pressure exerted by the _____ due to entry of water against the rigid walls is called pressure potential. Because of _____of cell wall, the cell does not rupture."
Which of the following is correct fill-up of the above paragraph in sequence?
(1) Reversible, hypotonic, cytoplasm, protoplasts, rigidity
(2) Reversible, hypertonic, protoplasm, protoplasts, flexibility
(3) Irreversible, hypotonic, cytoplasm, protoplasts, flexibility
(4) Irreversible, hypotonic, protoplasm, protoplasts, rigidity

197. **Assertion** : In monocot leaves upper epidermis has bulliform cells.

Reason : These cells are thick walled and protective in nature.

(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

198. Which of the following is wrong regarding symmetry of flower?

(1) Flower of Gulmohar can be divided into two halves by only one median vertical plane

(2) Flower of *Datura* and chilli shows radial symmetry

(3) *Canna* is bilaterally symmetrical flower

(4) Flower can be pentamerous, trimerous or tetramerous

199. Which of the following is incorrect with respect to glycolysis?

(1) In this process, glucose undergoes partial oxidation to form three molecules of pyruvic acid

(2) It is the only process in respiration in anaerobic organisms

(3) It occurs in the cytoplasm of the cell and is present in all living organisms

(4) A chain of ten reactions, under the control of different enzymes, takes place to produce pyruvate from glucose

200. Ammonification means

(1) conversion of nitrite into NH_4

(2) transformation of nitrate into NH_4

(3) fixation of atmospheric nitrogen in the form of NH_3

(4) conversion of nitrogenous organic compunds into NH_4 compounds

Space for rough work