

Physics

1. A man is at a distance of 6 m from a bus. The bus begins to move with a constant acceleration of 3 ms^{-2} . In order to catch the bus, the minimum speed with which the man should run towards the bus is

- (a) 2 ms^{-1}
- (b) 4 ms^{-1}
- (c) 6 ms^{-1}
- (d) 8 ms^{-1}

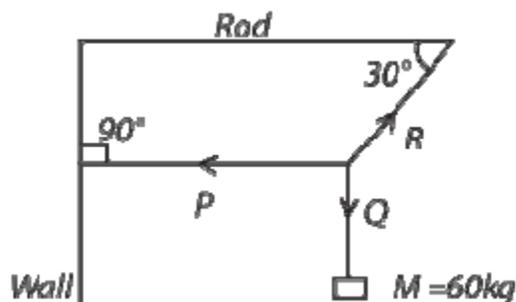
2. If \vec{A} and \vec{B} are non-zero vectors which obey the relation $|\vec{A} \times \vec{B}| = |\vec{A}| |\vec{B}| \sin \theta$, then the angle between them is

- (a) 0°
- (b) 60°
- (c) 90°
- (d) 120°

3. In a Fraunhofer diffraction at single slit of width d with incident light of wavelength 5500 \AA , the first minimum is observed, at angle 30° . The first secondary maximum is observed at an angle $\theta =$

- (a) $\sin^{-1} \frac{1}{\sqrt{2}}$
- (b) $\sin^{-1} \frac{1}{4}$
- (c) $\sin^{-1} \frac{3}{4}$
- (d) $\sin^{-1} \frac{\sqrt{3}}{2}$

4. A body of mass 60 kg is suspended by means of three strings P, Q and R as shown in the figure is in equilibrium. The tension in the string P is



- (a) 130.9 g N
- (b) 60 g N
- (c) 50 g N
- (d) 103.9 g N

5. The angular amplitude of a simple pendulum is θ . The tension in its string will be
- (a) $mg(1 - \theta)$
 - (b) $mg(1 + \theta)$
 - (c) $2mg(1 - \theta)$
 - (d) $2mg(1 + \theta)$
6. Three identical charges are placed at the vertices of an equilateral triangle. The force experienced by each charge, (if $k = 1/4\pi\epsilon_0$) is
- (a) $2k \frac{q^2}{r^2}$
 - (b) $\frac{kq^2}{2r^2}$
 - (c) $\sqrt{3}k \frac{q^2}{r^2}$
 - (d) $\frac{kq^2}{\sqrt{2}r^2}$
7. A voltmeter of resistance 20000Ω reads 5 volt. To make it read 20 volt, the extra resistance required is
- (a) 40000Ω in parallel
 - (b) 60000Ω in parallel
 - (c) 60000Ω in series
 - (d) 40000Ω in series
8. Light wave enters from medium 1 to medium 2. Its velocity in 2nd medium is double from 1st. For total internal reflection the angle of incidence must be greater than
- (a) 30°
 - (b) 60°
 - (c) 45°
 - (d) 90°
9. The temperature of a body is increased from -73°C to 327°C . Then the ratio of emissive power is
- (a) $1/9$
 - (b) $1/27$
 - (c) 27
 - (d) 81
10. Time period of pendulum, on a satellite orbiting the earth, is
- (a) $1/\pi$
 - (b) zero
 - (c) π
 - (d) infinity

11. Ten identical cells each of potential E and internal resistance r are connected in series to form a closed circuit. An ideal voltmeter connected across three cells, will read
- (a) $10E$
 - (b) $3E$
 - (c) $13E$
 - (d) $7E$
12. Two charged spheres separated by a distance ' d ' exert some force on each other. If they are immersed in a liquid of dielectric constant 2, then what is the force exerted, if all other conditions are same?
- (a) $F/2$
 - (b) F
 - (c) $2F$
 - (d) $4F$
13. A gun of mass 10 kg fires 4 bullets per second. The mass of each bullet is 20 g and the velocity of the bullet when it leaves the gun is 300 m s^{-1} . The force required to hold the gun when firing is
- (a) 6 N
 - (b) 8 N
 - (c) 24 N
 - (d) 240 N
14. A cylindrical tank is filled with water to level of 3 m. A hole is opened at height of 52.5 cm from bottom. The ratio of the area of the hole to that of cross-sectional area of the cylinder is 0.1. The square of the speed with which water is coming out from the orifice is (Take $g = 10 \text{ ms}^{-2}$)
- (a) $50 \text{ m}^2\text{s}^{-2}$
 - (b) $40 \text{ m}^2\text{s}^{-2}$
 - (c) $51.5 \text{ m}^2\text{s}^{-2}$
 - (d) $50.5 \text{ m}^2\text{s}^{-2}$
15. A transparent cube of 15 cm edge contains a small air bubble. Its apparent depth when viewed through one face is 6 cm and when viewed through opposite face is 4 cm. The refractive index of material of cube is
- (a) 2.0
 - (b) 1.5
 - (c) 1.6
 - (d) 2.5
16. A stone of mass 0.3 kg attached to a 1.5 m long string is whirled around in a horizontal circle at a speed of 6 m s^{-1} . The tension in the string is
- (a) 10 N
 - (b) 20 N
 - (c) 7.2 N
 - (d) 30 N
17. A ball is dropped from the top of a building 100 m high. At the same instant another ball is thrown upwards with a velocity of 40 m/s from the bottom of the building. The two balls will meet after
- (a) 3 s
 - (b) 2 s
 - (c) 2.5 s
 - (d) 5 s

18. If the linear momentum is increased by 50%, then kinetic energy will increase by
- (a) 50%
 - (b) 100%
 - (c) 125%
 - (d) 25%
19. The additional kinetic energy to be provided to a satellite of mass m revolving around a planet of mass M to transfer from a circular orbit of radius R_1 to another of radius R_2 ($R_2 > R_1$) is
- (a) $GmM \left(\frac{1}{R_1^2} - \frac{1}{R_2^2} \right)$
 - (b) $GmM \left(\frac{1}{R_1} - \frac{1}{R_2} \right)$
 - (c) $2GmM \left(\frac{1}{R_1} - \frac{1}{R_2} \right)$
 - (d) $\frac{1}{2} GmM \left(\frac{1}{R_1} - \frac{1}{R_2} \right)$
20. A sphere of mass 10 kg and radius 0.5 m rotates about a tangent. The moment of inertia of the sphere is
- (a) 5 kg m²
 - (b) 2.7 kg m²
 - (c) 3.5 kg m²
 - (d) 4.5 kg m²
21. The displacement of a particle executing SHM is given by $y = 0.25 \sin 200t$ cm. The maximum speed of the particle is
- (a) 200 cm s⁻¹
 - (b) 100 cm s⁻¹
 - (c) 50 cm s⁻¹
 - (d) 5.25 cm s⁻¹
22. A steady current flows in a metallic conductor of non-uniform cross-section. Which of these quantities is constant along the conductor?
- (a) Electric field
 - (b) Drift velocity
 - (c) Current
 - (d) Current density
23. The angle of dip at a certain place where the horizontal and vertical components of the earth's magnetic field are equal is
- (a) 30°
 - (b) 75°
 - (c) 60°
 - (d) 45°

24. Focal length of objective and eye piece of telescope are 200 cm and 4 cm respectively. What is the length of telescope for normal adjustment?

- (a) 196 cm
- (b) 204 cm
- (c) 250 cm
- (d) 225 cm

25. A series resonant LCR circuit has a quality factor (Q-factor) 0.4. If $R = 2 \text{ k}\Omega$, $C = 0.01 \text{ }\mu\text{F}$, then the value of inductance is

- (a) 0.1 H
- (b) 0.064 H
- (c) 2 H
- (d) 5 H

26. The intensity ratio of the maxima and minima in an interference pattern produced by two coherent sources of light is 9: 1. The intensities of the used light sources are in ratio

- (a) 3: 1
- (b) 4: 1
- (c) 9: 1
- (d) 10: 1

27. Which of the following has the longest de Broglie wavelength if they are moving with the same velocity?

- (a) Neutron
- (b) Proton
- (c) α -particle
- (d) β -particle

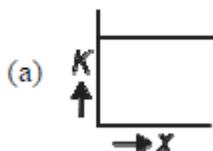
28. An atom of mass number 15 and atomic number 7 captures an α -particle and then emits a proton. The mass number and atomic number of the resulting atom will be respectively

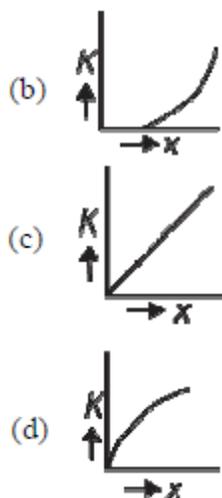
- (a) 14 and 2
- (b) 15 and 3
- (c) 16 and 4
- (d) 18 and 8

29. A zener diode is specified as having a break maximum power dissipation of 364 mW. What is the maximum current the diode can handle?

- (a) 40 mA
- (b) 60 mA
- (c) 50 mA
- (d) 45 mA

30. A body moves from rest with a constant acceleration. Which one of the following graphs represents the variation of its kinetic energy K with the distance travelled (x)?





31. A mass M is suspended from a spring of negligible mass. The spring is pulled a little and then released so that the mass executes simple harmonic oscillations

with a time period T . If the mass is increased by m , then the time period becomes $\left(\frac{5}{4}T\right)$. The ratio of M/m is

- (a) 9/16
- (b) 5/4
- (c) 25/16
- (d) 4/5

32. A wave is represented by the equation $y = 0.5 \sin(10t - x)$ metre. It is a travelling wave propagating along $+x$ direction with velocity

- (a) 10 m s⁻¹
- (b) 20 m s⁻¹
- (c) 5 m s⁻¹
- (d) None of these

33. A transistor connected at common emitter mode contains load resistance of 5kΩ. If the input peak voltage is 5 mV and the current gain is 50, find the voltage gain.

- (a) 250
- (b) 500
- (c) 125
- (d) 50

34. The two coherent sources with intensity ratio β produce interference. The fringe visibility will be

- (a) $\frac{2\sqrt{\beta}}{1+\beta}$
- (b) 2β

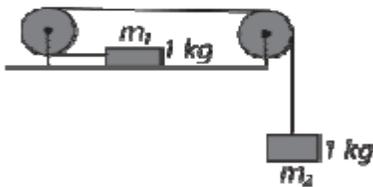
(c) $\frac{2}{(1+\beta)}$

(d) $\frac{\sqrt{\beta}}{1+\beta}$

35. On increasing the temperature of a conductor, its resistance increases because the

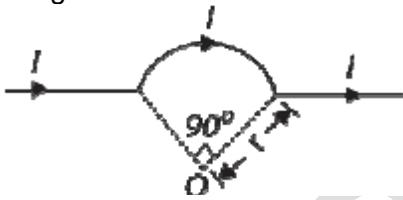
- (a) relaxation time increases
- (b) electron density decreases
- (c) relaxation time decreases
- (d) relaxation time remains constant

36. Consider the system shown in figure. The pulley and all the surfaces are frictionless. The tension in the string is (take $g = 10 \text{ m s}^{-2}$)



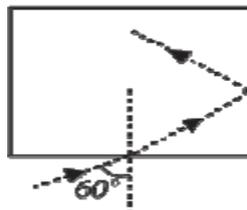
- (a) 0 N
- (b) 1 N
- (c) 2 N
- (d) 5 N

37. The magnetic field at the centre O of the arc shown in the figure is



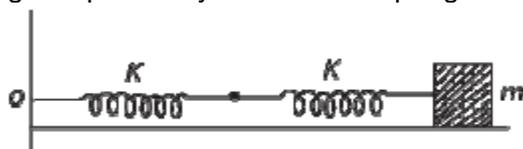
- (a) $2I(\sqrt{2} + \pi) \times \frac{10^{-7}}{r}$
- (b) $2I(\sqrt{2} + \frac{\pi}{4}) \times \frac{10^{-7}}{r}$
- (c) $I(\sqrt{2} + \pi) \times \frac{10^{-7}}{r}$
- (d) $I(\sqrt{2} + \frac{\pi}{4}) \times \frac{10^{-7}}{r}$

38. For a situation shown in figure, find the refractive index of glass so that it will suffer total internal reflection at the vertical surface.



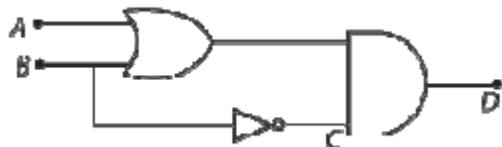
- (a) 1.732
- (b) 1.5
- (c) 1.31
- (d) 1.6

39. The frequency of oscillations of a mass m connected horizontally by a spring of spring constant k is 4 Hz. When the spring is replaced by two identical springs as shown in figure. Then the effective frequency is,



- (a) $4\sqrt{2}$
- (b) 1.5
- (c) 1.31
- (d) $2\sqrt{2}$

40. The output for the given circuit is



- (a) $(A + B) \cdot B$
- (b) $(A \cdot B) \cdot B$
- (c) $(A + B) \cdot \bar{B}$
- (d) $(A \cdot B) \cdot \bar{B}$

Directions (41-60): In each of the following questions, a statement of assertion is given followed by a corresponding statement of reason.

41. **Assertion:** In an adiabatic process, change in internal energy of a gas is equal to work done on or by the gas in the process.

Reason: Temperature of gas remains constant in an adiabatic process.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

42. **Assertion:** In YDSE bright and dark fringe are equally spaced.

Reason: It only depends upon phase difference.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

43. **Assertion:** Generally heavy nuclei are unstable.

Reason: It has more neutrons and protons.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.

(d) If both assertion and reason are false.

44. **Assertion:** In water, value of magnetic field decreases.

Reason: Water is diamagnetic substance.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

45. **Assertion:** Heavy water is used as moderator in nuclear reactor.

Reason: Water cool down the fast neutron.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

46. **Assertion:** Electron microscope has more resolving power than optical microscope.

Reason: We can control the energy of electron.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

47. **Assertion:** Unlike electric force and gravitational forces, nuclear force has limited range.

Reason: Nuclear force do not obey inverse square law.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

48. **Assertion:** The electromagnetic waves are transverse in nature.

Reason: Waves of wavelength $10\ \mu\text{m}$ are radiowave and microwave.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

49. **Assertion:** When a charge particle moves in a circular path. It produces electromagnetic wave.

Reason: Charged particle has acceleration.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

50. **Assertion:** When certain wavelength of light fall on metal surface it ejects electron.

Reason: Light was wave nature.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

51. **Assertion:** Lines of force are perpendicular to conductor surface.

Reason: Generally electric field is perpendicular to equipotential surface.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

52. **Assertion:** Magnetic field is useful in producing parallel beam of charged particle.

Reason: Magnetic field inhibits the motion of charged particle moving across it.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

53. **Assertion:** KE is conserved at every instant of elastic collision.

Reason: No deformation of matter occurs in elastic collision.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

54. **Assertion:** Magnetic field lines are continuous and closed.

Reason: Magnetic monopole does not exist.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

55. **Assertion:** Value of radius of gyration of a body depends on axis of rotation.

Reason: Radius of gyration is root mean square distance of particle of the body from the axis of rotation.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

56. **Assertion:** The graph of potential energy and kinetic energy of a particle in SHM with respect to position is a parabola.

Reason: Potential energy and kinetic energy do not vary linearly with position.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

57. **Assertion:** The specific heat of a gas in an adiabatic process is zero and in an isothermal process is infinite.

Reason: Specific heat of gas is directly proportional to change of heat in system and inversely proportional to change in temperature.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

58. **Assertion:** Electrons in the atom are held due to coulomb forces.

Reason: The atom is stable only because the centripetal force due to Coulomb's law is balanced by the centrifugal force.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

59. **Assertion:** At resonance, LCR series circuit has a minimum current.

Reason: At resonance, in LCR series circuit, the current and e.m.f. are not in phase with each other.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

60. **Assertion:** When an object is placed between two plane parallel mirrors, then all the images found are of equal intensity.

Reason: In case of plane parallel mirrors, only two images are possible.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

Chemistry

61. According to Bohr's theory, which of the following correctly represents the variation of energy and radius of an electron in n th orbit of H-atom?

- (a) $E_n \propto \frac{1}{n^2}, r \propto \frac{1}{n^2}$
- (b) $E_n \propto \frac{1}{n^2}, r \propto n^2$
- (c) $E_n \propto n^2, r \propto n^2$
- (d) $E_n \propto n, r \propto \frac{1}{n}$

62. For which of the following elements it is difficult to disproportionate in +3 oxidation state?

- (a) N
- (b) As
- (c) Sb
- (d) Bi

63. Best reagent for the conversion of AgNO_3 to Ag is

- (a) HClO_4
- (b) H_3PO_4
- (c) HIO_4
- (d) I_2

64. How many Faradays of electricity are required for the given reaction to occur? $\text{MnO}_4^- \rightarrow \text{Mn}^{2+}$

- (a) 5 F
- (b) 3 F
- (c) 1 F
- (d) 7 F

65. K_p for the reaction $A \rightleftharpoons B$ the partial pressure of B after equilibrium?

- (a) 1.2
- (b) 0.8
- (c) 0.6
- (d) 1

66. Paints and hair creams are respectively

- (a) sol and emulsion
- (b) aerosol and foam
- (c) emulsion and sol
- (d) foam and gel.

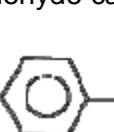
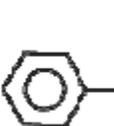
67. Chlorine oxidizes sodium thiosulphate to

- (a) Na_2SO_3
- (b) Na_2O
- (c) Na_2SO_4
- (d) Na_2CO_3

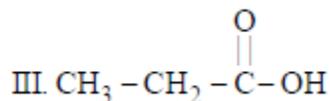
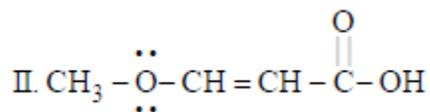
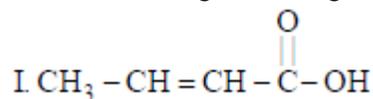
68. Large difference in boiling points is observed in

- (a) N and P
- (b) P and As
- (c) As and Sb
- (d) Sb and Bi

69. Benzaldehyde can be prepared from

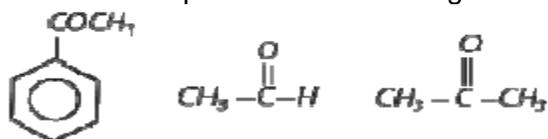
- (a)  + $\text{H}_2 \xrightarrow{\text{Pd/BaSO}_4}$
- (b)  + $\text{Br}_2 + \text{KOH} \rightarrow$
- (c)  + $\text{H}_2 \xrightarrow{\text{Sn/HCl}}$
- (d)  + $\text{N}_2^+ \text{Cl}^- + \text{H}_2\text{O} \rightarrow$

70. The acidic strength of the given compounds follows the order



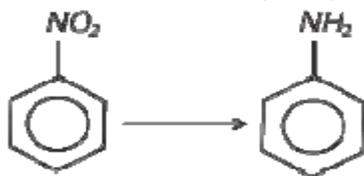
- (a) II > III > I
 (b) III > II > I
 (c) II > I > III
 (d) I > II > III

71. Ease of nucleophilic addition in the given compounds is



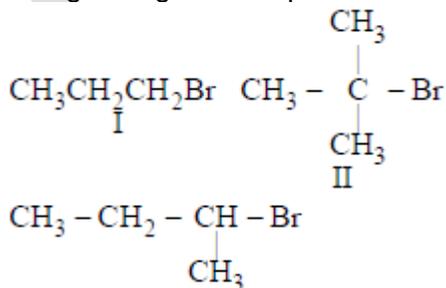
- (a) I > III > II
 (b) II > III > I
 (c) II > I > III
 (d) III > I > II

72. Which of the following reagents cannot be used for the given conversion?



- (a) Sn-HCl
 (b) Fe-HCl
 (c) LiAlH₄
 (d) Pd/C

73. Arrange the given compounds in decreasing order of boiling points.



- (a) I > III > II
(b) II > I > III
(c) I > II > III
(d) III > I > II
74. Which of the following molecules has more than one lone pair?
(a) SO₂
(b) XeF₂
(c) SiF₄
(d) CH₄
75. If an atom crystallizes in bcc lattice with $r = 4$
(a) 2 Å
(b) 8 Å
(c) 2.39 Å
(d) 9.23 Å
76. The reaction, $C_6H_5ONa + CO_2 + H_2O \rightarrow C_6H_5OH + NaHCO_3$ suggests that
(a) phenol is a stronger acid than carbonic acid
(b) carbonic acid is a stronger acid than phenol
(c) water is stronger acid than phenol
(d) None of these
77. A first order reaction, which is 30% complete in 30 minutes has a half-life period of
(a) 102.2 min
(b) 58.2 min
(c) 24.2 min
(d) 120.2 min
78. Which of the following species is not aromatic?
(a) Benzene
(b) Cyclooctatetraenyldianion
(c) Tropylium ion
(d) Cyclopentadienyl cation
79. 10 mL of liquid carbon disulphide (specific gravity 2.63) is burnt in oxygen. Find the volume of the resulting gases measured at STP.
(a) 23.25 L
(b) 22.26 L
(c) 23.50 L
(d) 20.08 L
80. Substances that are oxidized and reduced in the following reaction are respectively.
 $N_2H_{4(l)} + 2H_2O_{(2)l} \rightarrow N_{2(g)} + 4H_2O_{(l)}$
(a) N₂H₄, H₂O
(b) N₂H₄, H₂O₂
(c) N₂, H₂O₂
(d) H₂O, N₂

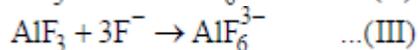
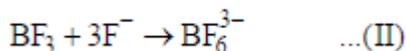
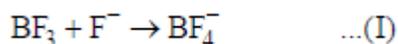
81. The heat liberated when 1.89 g of benzoic acid is burnt in a bomb calorimeter at 25°C and it increases the temperature of 18.94 kg of water by 0.632°C. If the specific heat of water at 25°C is 0.998 cal/g-deg, the value of the heat of combustion of benzoic acid is

- (a) 881.1 kcal
- (b) 771.12 kcal
- (c) 981.1 kcal
- (d) 871.2 kcal

82. Two elements A and B form compounds of formula AB₂ and AB₄. When dissolved in 20.0 g of benzene 1.0 g of AB₂ lowers f. pt. by 2.3°C whereas 1.0 g of AB₄ lowers f. pt. by 1.3°C. The K_f for benzene is 5.1. The atomic masses of A and B are

- (a) 25, 42
- (b) 42, 25
- (c) 52, 48
- (d) 48, 52

83. Which of the following reactions does not take place?



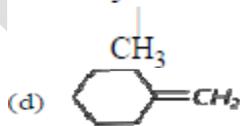
- (a) Only (I)
- (b) Only (II)
- (c) Only (III)
- (d) Only (I) and (III)

84. The freezing point of a solution containing 0.2 g of acetic acid in 20.0 g benzene is lowered by 0.45°C. The degree of association of acetic acid in benzene is (Assume acetic acid dimerises in benzene and K_f for benzene = 5.12 K kg mol⁻¹) M_{observed} of acetic acid = 113.78

- (a) 94.5%
- (b) 54.9%
- (c) 78.2%
- (d) 100%

85. Which of the following alkenes will give same product by any method out of hydration, hydroboration

- (a) CH₃CH = CH₂
- (b) CH₃CH = CHCH₃
- (c) CH₃CHCH = CH₂

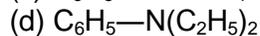
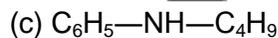
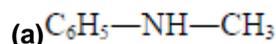


86. An element (X) belongs to fourth period and fifteenth group of the periodic table. Which one of the following configuration of (X)? It has

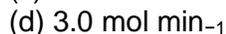
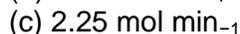
- (a) partially filled d orbitals and completely filled s orbital
- (b) completely filled s orbital and completely filled p orbitals
- (c) completely filled s orbital and half
- (d) half-filled d orbitals and completely filled s orbital.

87. Which is not classified as thermoplastics?
- Polyethylene
 - Polystyrene
 - Bakelite
 - Neoprene
88. Select the correct statement.
- Geometrical isomer may differ in dipole moment and visible/UV spectra
 - Complexes of the type $[Ma_3b_3]$ can also have facial (fac) and meridional (mer) isomer.
 - No optical isomer exists for the complex $\text{trans-}[\text{Co}(\text{en})_2\text{Cl}_2]^+$
 - All of these.
89. Four diatomic species are listed below in represents the correct order of their increasing bond order?
- $\text{C}_2^{2-} < \text{He}_2^+ < \text{NO} < \text{O}_2^-$
 - $\text{He}_2^+ < \text{O}_2^- < \text{NO} < \text{C}_2^{2-}$
 - $\text{O}_2^- < \text{NO} < \text{C}_2^{2-} < \text{He}_2^+$
 - $\text{NO} < \text{C}_2^{2-} < \text{O}_2^- < \text{He}_2^+$
90. The true statement for the acids of phosphorus, H_3PO_2 , H_3PO_3 and H_3PO_4 is
- the order of their acidity is $\text{H}_3\text{PO}_4 > \text{H}_3\text{PO}_3 > \text{H}_3\text{PO}_2$
 - all of them are reducing in nature
 - all of them are tribasic acids
 - the geometry of phosphorus is tetrahedral in all the three.
91. Which of the following can be oxidized by SO_2 ?
- $\text{K}_2\text{Cr}_2\text{O}_7$
 - Mg
 - H_2O
 - All of these
92. Which one of the following does not give white precipitate with acidified silver nitrate solution?
- 
 - $\text{CH}_2 = \text{CH}-\text{Cl}$
 - $\text{CH}_2 = \text{CH}-\text{CH}_2-\text{Cl}$
 - Both (a) and (b)
93. Oil used as frothing agent in froth
- pine oil
 - mustard oil
 - coconut oil
 - olive oil.

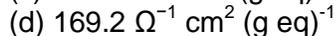
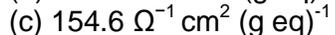
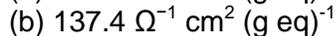
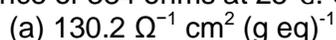
94. Which amine amongst the following will answer positively the carbylaminetest?



95. During the decomposition of H_2O_2 to give oxygen, 48 g O_2 is formed perminute at a certain point of time. The rate of formation of water at this point is



96. A conductivity cell has a cell constant of 0.5 cm^{-1} . This cell when filled with 0.01 M NaCl solution has a resistance of 384 ohms at 25°C . Calculate the equivalent conductance of the given solution



97. Arsenic drugs are mainly used in the treatment of

(a) Jaundice

(b) Typhoid

(c) Syphilis

(d) Cholera.

98. $\text{Glucose} \xrightarrow{\text{HCN}} \xrightarrow{\text{Hydrolysis}} \xrightarrow{\text{HI, heat}} \text{A}$, A is

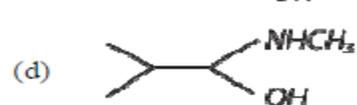
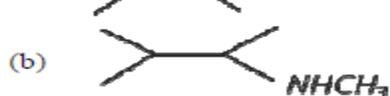
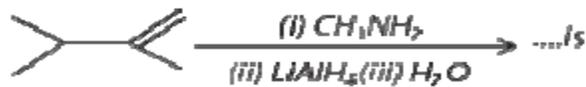
(a) heptanoic acid

(b) 2-iodohexane

(c) heptane

(d) heptanol

99. The major organic product formed in the following reaction



100. Among the following, the achiral amino acids is

- (a) 2-ethylalanine
- (b) 2-methylglycine
- (c) 2-hydroxymethylserine
- (d) tryptophan.

Directions: In the following questions (101-120), a statement of assertion is followed by a statement of reason.

101. **Assertion:** H_3BO_3 is a weak acid.

Reason: Water extracts the proton of H_3BO_3 .

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

102. **Assertion:** When acetamide reacts with NaOH and Br_2 , methyl amine is formed.

Reason: The reaction occurs through intermediate formation of isocyanate.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

103. **Assertion:** Chlorobenzene is more reactive than benzene towards the electrophilic substitution reaction.

Reason: Resonance destabilizes the carbocation.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

104. **Assertion:** $\text{Co}[\text{Hg}(\text{SCN})_6]$ and $\text{Hg}[\text{Co}(\text{SCN})_6]$ are isomers.

Reason: SCN^- is a stronger ligand as compared to NCS^-

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

105. **Assertion:** Acetone and aniline shows negative deviations.

Reason: H-bonding between acetone and aniline is stronger than that between acetone-acetone and aniline-aniline.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

106. **Assertion:** Generally alkali and alkaline earth metals form superoxides.

Reason: There is single bond between O and O in superoxides.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

107. **Assertion:** For hydrogen like species, energy of an electron in a particular orbit increases with increase in value of Z.

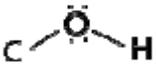
Reason: Electronegativity decreases across a period.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

108. **Assertion:** Charcoal is used in separation of noble gases.

Reason: Charcoal has porous structure.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

109. **Assertion:**  bond angle is less than the normal tetrahedral bond angle.

Reason: Lone pair-lone pair repulsion decreases bond angle.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

110. **Assertion:** Critical temperature of CO₂ is 304 K.

Reason: At a certain temperature, volume $\propto 1/\text{pressure}$

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

111. **Assertion:** Phenol is more acidic than ethanol.

Reason: Phenoxide ion is resonance stabilized.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

112. **Assertion:** Diamagnetic substances are not attracted by magnetic field.

Reason: Diamagnetic substances have no unpaired electrons.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

113. **Assertion:** Staggered conformation of ethane is 12.5 kJ mol⁻¹ more stable than the eclipsed conformation.

Reason: The two conformations of ethane cannot be separated at room temperature.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

114. **Assertion:** A reaction which is spontaneous and accompanied by decrease of randomness must be exothermic.

Reason: All exothermic reactions are accompanied by decrease of randomness.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

115. **Assertion:** H_2S is stronger acid than PH_3 .

Reason: S is more electronegative than P, conjugate base HS^- is more stable than H_2P^- .

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

116. **Assertion:** 2-Methyl-1, 3-butadiene is the monomer of natural rubber.

Reason: Natural rubber is formed through anionic addition polymerization.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

117. **Assertion:** The Dumas method is more applicable to nitrogen containing organic compounds than the Kjeldahl's method.

Reason: The Kjeldahl's method does not give satisfactory results for compounds in which nitrogen is directly linked to oxygen.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

118. **Assertion:** A solution of sucrose in water is dextrorotatory. But on hydrolysis in the presence of a little hydrochloric acid, it becomes laevorotatory.

Reason: Sucrose on hydrolysis gives unequal amounts of glucose and fructose. As a result of this, change in sign of rotation is observed.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

119. **Assertion:** In electrolysis, the quantity of electricity needed for depositing 1 mole silver is different from that required for 1 mole of copper.

Reason: The molecular weights of silver and copper are different.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

120. **Assertion:** Heat of neutralization for both H_2SO_4 and HCl with NaOH is 53.7kJ mol^{-1} .

Reason: Both HCl and H_2SO_4 are strong acids.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

Biology

121. Which of the following are homosporous pteridophytes?

I. Selaginella II. Lycopodium III. Salvinia IV. Equisetum

- (a) I and IV only
- (b) II and III only
- (c) II and IV only
- (d) III and IV only

122. Which of the following is the correct scientific name of wheat derived by binomial nomenclature?

- (a) Triticum Vulgare
- (b) Triticumaestivum
- (c) Oryza sativa
- (d) Zea mays

123. The genetic material in tobacco mosaic virus is

- (a) ss DNA
- (b) ss RNA
- (c) ds RNA
- (d) ds DNA

124. Select the incorrect match.

- (a) Citric acid – Aspergillus niger
- (b) Streptokinase - Streptococcus
- (c) Butyric acid – Clostridium acetobutylicum
- (d) Cyclosporin-A – Monascus purpureus

125. Which of the following statements is correct regarding menstrual cycle?

- (a) LH induces rupturing of Graafian follicle.
- (b) Proliferative phase is characterized by the increased production of progesterone.
- (c) Corpus luteum secretes large amount of estrogen.
- (d) Both LH and FSH attain a peak level in secretory phase.

126. Match column I with column II and select the correct option from the codes given below.

Column I

- (a). Commensalism
- (b). Parasitism
- (c). Mutualism
- (d). Amensalism

Column II

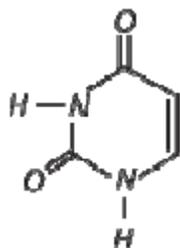
- (i) One inhibited, other unaffected
- (ii) One benefitted, other unaffected
- (iii) Both are benefitted
- (iv) One benefitted, other harmed

- (a) A – (iv), B – (ii), C– (iii), D – (i)
- (b) A – (iii), B – (iv), C– (ii), D – (i)
- (c) A – (ii), B – (iv), C– (iii), D – (i)
- (d) A – (ii), B – (iv), C– (i), D – (iii)

127. Which of the following is used as bioinsecticide?

- (a) *Bacillus polymyxa*
- (b) *Cylindrospermumlicheniforme*
- (c) *Phytophthora palmivora*
- (d) *Chrysanthemum cinerarifolium*

128. Identify the given structure.



- (a) Adenylic acid
- (b) Uracil
- (c) Cholesterol
- (d) Adenosine

129. If both parents are carriers for thalassaemia, which is an autosomal recessive disorder, what are the chances of pregnancy resulting in an affected child?

- (a) 25%
- (b) 100%
- (c) No chance
- (d) 50%

130. The correct sequence of stages in the evolution of modern man (*Homo sapiens*), is

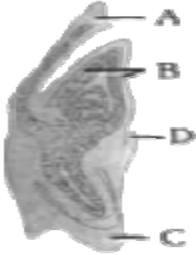
- (a) *Homo erectus*, *Australopithecus*, neanderthal man, cro-magnon man, modern man
- (b) *Australopithecus*, *Homo erectus*, Neanderthal man, cro-magnon man, modern man
- (c) Neanderthal man, *Australopithecus*, cro-magnon man, *Homo erectus*, modern man
- (d) *Australopithecus*, Neanderthal man, cro-magnon man, *Homo erectus*, modern man

131. Cornea transplant in humans is almost never rejected. This is because

- (a) it is composed of enucleated cells
- (b) it is a non-living layer
- (c) its cells are least penetrable by bacteria
- (d) it has no blood supply.

132. Pseudostratified epithelium is found in
 (a) seminiferous tubule
 (b) Fallopian tube
 (c) trachea
 (d) kidney tubules.

133. Identify the parts labeled A, B, C and D in the given figure and select the correct option.



- (a) A – Scutellum ; B –Epiblast ; C – Coleoptile ; D – Coleorhiza
 (b) A – Scutellum ; B –Coleorhiza ; C – Coleoptile ; D – Epiblast
 (c) A – Scutellum ; B –Coleoptile ; C – Coleorhiza ; D – Epiblast
 (d) A – Epiblast ; B – Coleoptile ; C– Coleorhiza ; D – Scutellum
134. Match column I with column II and select the correct option from the given codes.

Column I

- (a). Parthenocarpy
 (b). Polyembryony
 (c). Apomixis
 (d). Somatic embryogenesis

Column II

- (i) Seed formation without fertilization
 (ii) More than one embryo in same seed
 (iii) Seedless fruits without fertilization
 (iv) Embryo develops from a somatic cells

- (a) A – (iv), B – (ii) , C– (iii), D – (i)
 (b) A – (iii), B – (ii) , C– (i), D – (iv)
 (c) A – (i), B – (iv) , C– (iii), D – (ii)
 (d) A – (ii), B – (iii) , C– (i), D – (iv)

135. The given figure shows schematic plan of blood circulation in humans with labels A to D. Identify the labels along with their functions and select the correct option.



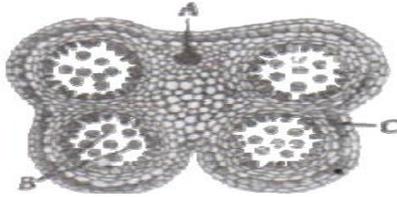
- (a) C – Vena Cava – takes blood from body parts to right atrium, $PCO_2 = 45\text{ mm Hg}$
 (b) D – Dorsal aorta – takes blood from heart to body parts, $PO_2 = 95\text{ mm Hg}$
 (c) A – Pulmonary vein– takes impure blood from body parts to heart, $PO_2 = 600\text{ mm Hg}$
 (d) B – Pulmonary artery– takes blood from heart to lungs, $PO_2 = 90\text{ mm Hg}$

136. Which one of the following is not a mammalian character?
- (a) Presence of milk producing glands
 - (b) Skin is unique in possessing hair
 - (c) Presence of external ears called pinnae
 - (d) Homodont type of dentition
137. Retrogressive metamorphosis occurs in
- (a) Hemichordata
 - (b) Cephalochordata
 - (c) Urochordata
 - (d) Vertebrata.
138. Most animals that live in deep oceanic waters are
- (a) tertiary consumers
 - (b) detritivores
 - (c) primary consumers
 - (d) secondary consumers.
139. One hormone hastens maturity period in juvenile conifers, a second hormone controls xylem differentiation, while the third hormone increases the tolerance of plants to various stresses. They are respectively
- (a) Gibberellin, Auxin, Ethylene
 - (b) Auxin, Gibberellin, Cytokinin
 - (c) Gibberellin, Auxin, ABA
 - (d) Auxin, Gibberellin, ABA.
140. In a 3.2 Kbp long pieces of DNA, 820 adenine bases were found. What would be the number of cytosine bases?
- (a) 780
 - (b) 1560
 - (c) 740
 - (d) 1480
141. Match column with column II and select the correct option from codes given below.
- Column I**
- A. Brassica
 - B. Okra
 - C. Wheat
 - D. Cowpea
- Column II**
- (i) Himgiri
 - (ii) Pusa Komal
 - (iii) Pusa Gaurav
 - (iv) Pusa Sawani
- (a) A – (iii), B – (iv), C – (i), D – (ii)
 - (b) A – (i), B – (ii), C – (ii), D – (iv)
 - (c) A – (iv), B – (iii), C – (i), D – (ii)
 - (d) A – (ii), B – (iv), C – (i), D – (iii)

142. Some of the steps of DNA fingerprinting are given below. Identify their correct sequence from the options given.
- A. Electrophoresis of DNA fragments
 - B. Hybridization with DNA probe
 - C. Digestion of DNA by restriction endonucleases
 - D. Autoradiography
 - E. Blotting of DNA fragments nitrocellulose membrane
- (a) C – A – B – E – D
 - (b) C – A – E – B – D
 - (c) A – E – C – B – D
 - (d) A – C – E – D – B
143. One of the following statements is incorrect with reference of biodiversity. Identify it.
- (a) The areas with very few plant and animal species (low species richness) with no threatened species are called biodiversity hotspots.
 - (b) Biodiversity increases from higher altitudes to lower altitudes.
 - (c) Biodiversity decreases from the equator to polar regions.
 - (d) Depletion in genetic diversity of crop plants is mainly due to the introduction of better varieties with high yield, disease resistance, etc.
144. The H-zone in the skeletal muscle fibre is due to
- (a) the central gap between actin filaments extending through myosin filaments in the A-band
 - (b) extension of myosin filaments in the central portion of the A-band
 - (c) the absence of myofibrils in the central portion of A-band
 - (d) the central gap between myosin filaments in the A-band.
145. The volume of 'anatomical dead space' air is normally
- (a) 230 mL
 - (b) 210 mL
 - (c) 190 mL
 - (d) 150 mL
146. Tetradynamous condition is found in
- (a) *Hibiscus rosa-sinensis*
 - (b) *Ocimum sanctum*
 - (c) *Helianthus annuus*
 - (d) *Brassica campestris*.
147. Yeast is not included in protozoans but in fungi because
- (a) it has chlorophyll
 - (b) it shows saprotrophic mode of nutrition
 - (c) it has eukaryotic organization
 - (d) cell wall is made up of cellulose and reserve food materials as starch.
148. As secondary growth proceeds, in a dicot stem, the thickness of
- (a) sapwood increases
 - (b) heartwood increases
 - (c) both sapwood and heartwood increases
 - (d) both sapwood and heartwood remains the same.

149. Which of the following represents the action of insulin?
- Increases blood glucose level by stimulating glucagon production.
 - Decreases blood glucose level by forming glycogen.
 - Increases blood glucose level promoting cellular uptake of glucose.
 - Increases blood glucose level by hydrolysis of glycogen.
150. Photosynthesis in C_4 plant is relatively less limited by atmospheric CO_2 levels because
- there is effective pumping of CO_2 into bundle sheath cells
 - RuBisCO in C_4 plants has higher affinity for CO_2
 - six carbon acids are the primary initial CO_2 fixation products
 - the primary fixation of CO_2 is mediated via PEP carboxylase.
151. The chemiosmotic coupling hypothesis of oxidative phosphorylation proposes that adenosine triphosphate (ATP) is formed because
- a proton gradient forms across the inner mitochondrial membrane
 - there is a change in the permeability of the inner mitochondrial membrane towards adenosine diphosphate (ADP)
 - high energy bonds are formed in mitochondrial proteins
 - ADP is pumped out of the matrix into the intermembrane space.
152. If the sequence of bases in the coding strand of a double stranded DNA is 5'-GTTCGAGTC-3', the sequence of bases in its transcript will be
- 5'-GACUCGAAC-3'
 - 5'-CAAGCUCAG-3'
 - 5' -GUUCGAGUC-3'
 - 5'-CUGAGCUUG-3'
153. A plasmolysed cell can be deplasmolysed by placing it in
- isotonic solution
 - saturated solution
 - pure water or hypotonic solution
 - hypertonic solution.
154. One greenhouse gas contributes 14% to total global warming and another contributes 6%. These are respectively identified as
- N_2O and CO_2
 - CFCs and N_2O
 - Methane and CO_2
 - methane and CFCs.
155. Which one of the following is correct for the transmembrane proteins in lipid bilayer of plasma membrane?
- They are absent in animal cells.
 - They act as channel proteins
 - They are absent in plant cells.
 - They are only externally located.
156. Which of the following is a group of micronutrients for plants?
- Fe, Mn, Cu, Mo, Zn
 - Fe, Mn, Cu, O, C
 - Cu, B, Cl, Fe, Ca
 - Ca, Mg, Fe

157. The following is the diagram of T.S. of anther. Identify the parts labeled A, B and C.



- (a) A-Connective tissue, B-Pollen grains, C-Endothecium
- (b) A-Endothecium, B-Connective tissue, C-Pollen grains
- (c) A-Pollen grains, B-Connective tissue, C-Endothecium
- (d) A-Endothecium, B-Pollen grains, C-Connective tissue

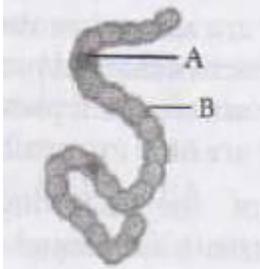
158. If 'A' represents the dominant gene and 'a' represents its recessive allele, which of the following would be the most likely result in the first generation offspring when Aa is crossed with aa?

- (a) All will exhibit dominant phenotype.
- (b) All will exhibit recessive phenotype.
- (c) Dominant and recessive phenotypes will be 50% each.
- (d) Dominant phenotype will be 75%.

159. The number of chromosomes present in the cells of the bread wheat, *Triticum aestivum* suggests that it is

- (a) Hexaploid
- (b) diploid
- (c) tetraploid
- (d) pentaploid.

160. Identify the labeled part in the given figure and select the correct option.



- (a) A – Heterocyst; B– Mucilaginous sheath
- (b) A – Mucilaginous; B- Heterocyst
- (c) A – Heterocyst; B– Capsid
- (d) A – Pseudopodia; B– Mucilaginous sheath

Directions: In the following questions (161-180), a statement of assertion is followed by a statement of reason.

161. **Assertion:** Gap junctions perform cementing function to neighbouring cells together.

Reason: Tight junctions facilitate the cells to communicate with each other by connecting the cytoplasm of adjoining cells, for rapid transfer of ions, small and big molecules, etc.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

162. **Assertion:** Hardy-Weinberg principle states that in the absence of disturbing influences, gene frequencies of large populations of sexually reproducing organisms do not change, provided that matings, occur at random.

Reason: The disturbing influences in genetic recombination and natural selection.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

163. **Assertion:** Endothecium layer of anther wall plays an important role in dehiscence of anther.

Reason: The presence of fibrous bands and differential expansion of inner and outer tangential walls of endothelial cells cause dehiscence of anther.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

164. **Assertion:** Sphagnum is slowly carbonized, compressed, and fossilized over thousands of years to produce a dark spongy mass called peat.

Reason: Peat helps to keep soil porous and it also improves water holding capacity of the soil.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

165. **Assertion:** In Pleurobrachia, eight comb like ciliary plates called comb plates are present on the body that help in locomotion.

Reason: Pleurobrachia reproduces sexually and its life cycle includes cypid larva.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

166. **Assertion:** Foetal disorders can be diagnosed by chorionic villi sampling.

Reason: Karyotyping can be done for mitotically dividing cells of chorionic villi.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

167. **Assertion:** Consciousness is considered as the defining property of living organisms.

Reason: All organisms, from the prokaryotes to the most complex eukaryotes can sense and respond to environmental stimuli.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

168. **Assertion:** The technique of micro propagation has been used to introduce variations in the offspring.

Reason: It is not possible to generate virus-free plants by micro propagation.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.

- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

169. **Assertion:** IgM is a type of immunoglobulin which cannot cross the placenta.

Reason: IgM is pentamer immunoglobulin, joined by J-chain.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

170. **Assertion:** Pili are tubular structures present in bacteria which help in conjugation.

Reason: Formation of pili is controlled by F+ or fertility factor.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

171. **Assertion:** In opposite phyllotaxy two leaves are borne on the opposite sides of a single node.

Reason: Opposite phyllotaxy is seen in China rose and Oleander.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

172. **Assertion:** XX-XY type of sex determination mechanism is an example of male heterogamety.

Reason: In birds, male heterogamety is seen as males produce two different types of gametes.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

173. **Assertion:** Curdling is required in the manufacture of cheese.

Reason: Lactic acid bacteria are used for the purpose.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

174. **Assertion:** Storage of seeds at low temperature is possible.

Reason: Respiration and enzymatic activity of seeds are very high at low temperature.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

175. **Assertion:** Presence of pneumatophores is a special adaptation of hydrophytes.

Reason: Pneumatophores are positively geotropic shoots that have lenticels and help in gaseous exchange.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

176. **Assertion:** CAM plants lack structural compartmentation of leaf as found in C4 plants.

Reason: Stomata of CAM plants are open during the day.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

177. **Assertion:** Carbohydrates are more suitable for the production of energy in the body than proteins and fats.

Reason: Carbohydrates can be stored in the tissues as glycogen and can be used for the production of energy, whenever necessary.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

178. **Assertion:** Atmospheric nitrogen gas is always fixed by nitrogen-fixing micro-organisms.

Reason: Decomposers release nitrogen gas from dead bodies of plants and animals.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

179. **Assertion:** All motor neurons nerve impulses from the spinal cord to the brain.

Reason: Motor neurons conduct nerve impulses from the spinal cord to the brain.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

180. **Assertion:** Number of chromosomes in one genome is equal to number of linkage groups.

Reason: Linkage groups give important information about the location of genes in the chromosomes.

- (a) If both assertion and reason are true and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) If assertion is true but reason is false.
- (d) If both assertion and reason are false.

General Knowledge

181. Who among the following is the current CEO of Google?

- (a) Satya Nadella
- (b) Pichai Sundararajan
- (c) Francisco D'Souza
- (d) Kalanithi Maran

182. Which of the following states is declared as first digital state of India by President Pranab Mukherjee?

- (a) Andhra Pradesh
- (b) Kerala
- (c) Karnataka
- (d) Assam

183. Who among the following actresses won 63rd National Film Award for the best actress?
- (a) Kangana Ranaut
 - (b) Priyanka Chopra
 - (c) Katrina Kaif
 - (d) Deepika Padukone
184. In an aeroplane, the color of 'Black Box' is
- (a) grey
 - (b) orange
 - (c) white
 - (d) black.
185. Who among the following designed the new symbol of Indian rupee?
- (a) D. Udaya Kumar
 - (b) Hitesh Padmashali
 - (c) Shibin KK
 - (d) Nondita Mehrotra
186. Olympic 2016 will be held at
- (a) London
 - (b) Tokyo
 - (c) Beijing
 - (d) Rio de Janeiro.
187. Which among the following planets of solar system is known as blue planet?
- (a) Venus
 - (b) Jupiter
 - (c) Mars
 - (d) Earth
188. Which of the following National Parks is known as "Sairandhri Vanam"?
- (a) Periyar National Park
 - (b) Silent Valley National Park
 - (c) Jim Corbett National Park
 - (d) Neora Valley National Park
189. Recently ISRO launched its IRNSS-IG satellite for the purpose of
- (a) space research
 - (b) navigation
 - (c) communication
 - (d) meteorology
190. The first bullet train in India will be run from
- (a) Mumbai to New Delhi
 - (b) Mumbai to Ahmedabad
 - (c) New Delhi to Chennai
 - (d) New Delhi to Varanasi.
191. Which of the following states will not conduct assembly elections in the year 2017?
- (a) Himachal Pradesh
 - (b) Uttarakhand

- (c) Punjab
- (d) Goa

192. From which year the women fighter pilots will be serving the Indian Airforce?

- (a) 2017
- (b) 2018
- (c) 2019
- (d) 2020

193.



The given logo represents which of the following programmes that have been initiated by Government of India?

- (a) MGNREGA
- (b) Make in India
- (c) Clean India
- (d) DigiLocker

194. In a row of serially placed students. A was placed 7th from left and B was 9th from right. Further they exchanged their positions. After exchanging positions B became nineteenth from right. So the position of B from the middle of the row is

- (a) seventh
- (b) fourth
- (c) sixth
- (d) eighth.

195.



This logo is of

- (a) Reserve Bank of India
- (b) Election Commission of India
- (c) Census
- (d) Planning Commission of India

196. Which of the following countries won 2015 Davis cup?

- (a) Great Britain
- (b) Belgium
- (c) United States
- (d) Germany

-
197. How many banks were nationalized in India in 1969?
- (a) 16
 - (b) 14
 - (c) 15
 - (d) 20
198. Which of the following days is celebrated as world food day?
- (a) September 10
 - (b) August 16
 - (c) November 4
 - (d) October 16
199. The exact point where the earthquake actually originates deep inside the earth's crust is called as
- (a) epicentre
 - (b) seismic zone
 - (c) focus
 - (d) hyperpoint.
200. CAG stands for
- (a) Comptroller and auditor general
 - (b) Computer assisted graphics
 - (c) Control assisted graphics
 - (d) Comptroller assisted general