SOLVED PAPER
AIIMS - 1996

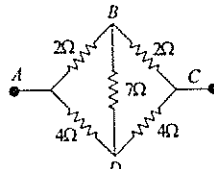Time : 3½ Hours   Max. Marks : 200

PHYSICS

1. A nucleus emits one α-particle and forms a new nucleus. The mass and charge of the new nucleus is changed in one of the following way
   (a) mass is reduced by 2 and charge is reduced by 2
   (b) mass is reduced by 4 and charge is reduced by 6
   (c) mass is reduced by 2 and charge is reduced by 4
   (d) mass is reduced by 4 and atomic no. is reduced by 2.

2. If at same temperature and pressure, the densities for two diatomic gases are d_1 and d_2 respectively, then the ratio of velocities of sound in these gases will be

   (a) $\sqrt{\dfrac{d_2}{2d_1}}$ (b) $\sqrt{\dfrac{d_2}{d_1}}$

   (c) $\sqrt{\dfrac{2d_1}{d_2}}$ (d) $\sqrt{\dfrac{d_1}{d_2}}$

3. The equivalent resistance between A and C of the given circuit, is
   (a) 8 Ω
   (b) $\dfrac{32}{12}$ Ω
   (c) $\dfrac{4}{3}$ Ω   (d) $\dfrac{8}{3}$ Ω.

4. Which of the following will deflect in electric field?
   (a) cathode-ray   (b) X-rays
   (c) ultra-violet rays   (d) γ-rays.

5. The working of a dynamo is based on the principle of
   (a) chemical effect of current
   (b) heating effect of current

   (c) electromagnetic induction
   (d) magnetic effect of current.

6. A galvanometer can be changed into ammeter by providing
   (a) high resistance in series
   (b) low resistance in series
   (c) high resistance in parallel
   (d) low resistance in parallel.

7. The energy produced in the sun is due to
   (a) chemical reaction   (b) fission reaction
   (c) fusion reaction   (d) all of these.

8. Plate current will be maximum, when
   (a) grid is negative while anode is positive
   (b) both the grid and anode are positive
   (c) grid is positive while anode is negative
   (d) both the grid and anode are negative.

9. Thermocouple thermometer is based on
   (a) Peltier effect   (b) Seebeck effect
   (c) photoelectric effect
   (d) Compton effect.

10. On increasing the temperature of a substance gradually, its colour becomes
    (a) yellow   (b) red
    (c) white   (d) green.

11. A source of frequency 240 Hz is moving towards an observer with a velocity of 20 m/s. The observer is now moving away the source with a velocity of 20 m/s. Apparent frequency heard by observer, if velocity of sound is 340 m/s, is
    (a) 268 Hz   (b) 270 Hz
    (c) 360 Hz   (d) 240 Hz.

12. When light rays enter in a glass slab, their wavelength
    (a) remains unchanged
    (b) decreases
    (c) increases
    (d) either (a) or (b).

13. A convex lens of focal length 40 cm is in contact with a concave lens of focal length 25 cm. The power of the combination, is
(a) + 6.67 D   (b) - 6.5 D
(c) - 1.5 D   (d) + 6.5 D.

14. Photoelectric effect of light is due to
(a) photons   (b) protons
(c) electric effect   (d) quanta.

15. Extra pressure inside a soap bubble of radius (r) is proportional to
(a) r^2 (b) r
(c) $1/r^2$ (d) $1/r$.

16. If a spring of mass 30 kg has spring constant of 15 N/m, then its time period, is
(a) 2π sec   (b) $2\sqrt{2\pi}$ sec
(c) $2\sqrt{2}$ sec   (d) $2\pi\sqrt{2}$ sec.

17. If the radii of circular paths of two particles of same masses are in the ratio 1 : 2, then to have a constant centripetal force, their velocities should be in a ratio of
(a) 4 : 1   (b) $1 : \sqrt{2}$
(c) 1 : 4   (d) $\sqrt{2} : 1$.

18. Ratio of the amount of heat radiation, transmitted through the body to the amount of heat radiation incident on it, is known as
(a) transmittance   (b) conductance
(c) absorbance   (d) inductance.

19. A body of mass m is placed on a rough surface with coefficient of friction (μ) inclined at θ. If the mass is in equilibrium, then
(a) $\theta = \tan^{-1}\left(\dfrac{m}{\mu}\right)$ (b) $\theta = \tan^{-1}(\mu)$
(c) $\theta = \tan^{-1}\left(\dfrac{\mu}{m}\right)$ (d) $\theta = \tan^{-1}(1/\mu)$.

20. The forces, which meet at one point but their lines of action do not lie in one plane, are called
(a) non-coplanar concurrent forces
(b) coplanar concurrent forces
(c) non-coplanar non-concurrent forces
(d) coplanar non-concurrent forces.

21. Which of the following is constant in a projectile motion?

(a) velocity of projection
(b) horizontal component of the velocity
(c) vertical component of the velocity
(d) all of these.

22. Which of the following is a non-conservative force?
(a) electrostatic force   (b) viscous force
(c) interatomic force   (d) gravitational force.

23. The equation of a wave is given by: $y = 10 \sin\left(\dfrac{2\pi t}{30} + \alpha\right)$. If the displacement is 5 cm at $t = 0$, then the total phase at $t = 7.5$ sec will be
(a) $\dfrac{2\pi}{3}$ rad   (b) $\dfrac{\pi}{3}$ rad
(c) $\dfrac{\pi}{2}$ rad   (d) $\dfrac{2\pi}{5}$ rad.

24. The displacement of a body is given to be proportional to the cube of time elapsed. The magnitude of the acceleration of the body, is
(a) constant but not zero
(b) increasing with time
(c) zero
(d) decreasing with time.

25. If $_{92}U^{238}$ undergoes successively 8 α-decays and 6 β-decays, then the resulting nucleus is
(a) $_{82}U^{210}$ (b) $_{82}U^{208}$
(c) $_{82}U^{214}$ (d) $_{82}U^{206}$.

26. If the plate resistance of a triode is 3.3×10^{-3} Ω and its mutual conductance is 3×10^3 mhos, then the amplification factor is nearly equal to
(a) 10^3 (b) 10^{-2}
(c) 10^6 (d) 10^1.

27. The cathode of a photoelectric cell is charged, such that the work function changes from W_1 to W_2 (where $W_2 < W_1$). If the currents, before and after the changes are I_1 and I_2 respectively and all other conditions remaining unchanged, then
(a) $I_1 = I_2$ (b) $I_1 < I_2$
(c) $I_1 > 2I_2$ (d) $I_1 > I_2$.

28. A lightly damped oscillator with a frequency (ω) is set in motion by harmonic driving force of frequency (n). When $n < \omega$, then response of the oscillator is controlled by
(a) oscillator frequency
(b) spring constant

(c) damping coefficient

(d) inertia of the mass.

29. The temperature of a gas is held constant, while its volume is decreased. The pressure exerted by the gas on the walls of the container increases, because its molecules

(a) strike the walls more frequently

(b) strike the walls with higher velocities

(c) are in contact with the walls for a shorter time

(d) strike the walls with larger force.

30. Threshold frequency for a metal is 10^{15} Hz. If the light of wavelength 4000 Å falls on its surface, then which of the following statement is correct?

(a) photoelectrons come out with a velocity of 100 m/sec

(b) no photoelectric emission takes place

(c) photoelectrons come out with a velocity of 124 m/sec

(d) photoelectrons come out with a velocity of 9.8 m/sec.

31. The volume of a gas expands by 0.25 m^3 at a constant pressure of 10^3 N/m. The work done is equal to

(a) 250 watt   (b) 2.5 erg

(c) 250 newton   (d) 250 joule.

32. If voltage across an X-ray tube is doubled, then energy of X-rays emitted by this tube would

(a) become half   (b) be doubled

(c) remain the same   (d) be quardrupled.

33. The velocity of electromagnetic waves in free space is 3×10^8 m/sec. The frequency of a radio wave of wave length 150 m, is

(a) 20 kHz   (b) 45 MHz

(c) 2 kHz   (d) 2 MHz.

34. In general, the wavelength of microwaves, is

(a) more than that of infrared waves

(b) more than that of radiowaves

(c) less than that of infrared waves

(d) less than that of ultraviolet waves.

35. A boy of mass 40 kg is standing in a lift, which is moving downwards with an acceleration 9.8 m/s^2. The apparent weight of the boy is (Take $g = 9.8$ m/s^2)

(a) 40×9.8 N   (b) 0 N

(c) 40/9.8 N   (d) 40 N.

36. The magnetic flux linked with a coil, in webers, is given by the equation: $\phi = 5t^2 + 3t + 16$. The induced e.m.f. in the coil in the fourth second will be

(a) 145 V   (b) 10 V

(c) 210 V   (d) 108 V.

37. Critical temperature can be defined as the temperature

(a) at which the volume of a gas becomes zero

(b) at which there is no motion between the molecules

(c) above which a gas cannot be liquified, no matter however high the pressure may be

(d) at which a gas is converted into its liquid state.

38. A tape-recorder records sound in the form of

(a) magnetic energy

(b) electrical energy

(c) variable resistance on the tape

(d) magnetic field on the tape.

39. The H_α line of hydrogen

(a) has a wavelength smaller than that of the H_β line

(b) has a wavelength 4860 Å

(c) is emitted in the transition from the second excited state to the first excited state

(d) has a wavelength 6060 Å.

40. An observer standing by the side of a road hears the siren of an ambulance, which is moving away from him. If the actual frequency of the siren is 2,000 Hz, then the frequency heard by the observer will be

(a) 2000 Hz   (b) 1990 Hz

(c) 4000 Hz   (d) 2100 Hz.

41. Calorimeters are made of which of the following?

(a) wood   (b) glass

(c) metal   (d) either (a) or (b).

42. Light year is the unit of

(a) velocity   (b) time

(c) intensity of light   (d) distance.

43. Angle between two vectors of magnitudes 12 and 18 units, when their resultant is 24 units is

(a) 82°31'   (b) 63°51'

(c) 89°16'   (d) 75°52'.

44. Emission of β-rays in radioactive decay results in the change of

(a) both mass and charge

(b) mass but not in charge

(c) either mass and charge

(d) charge but not in mass.

45. If a steady current of 4 A maintained for 40 minutes, deposits 4.5 g of zinc at the cathode end, then its chemical equivalent, is

(a) 47×10^{-5} g/C   (b) 26×10^{-6} g/C

(c) 51×10^{-7} g/C   (d) 36×10^{-6} g/C.

46. When the axis of rotation passes through its centre of gravity, then the moment of inertia of a rigid body is

(a) reduced to its minimum value

(b) zero

(c) increased to its maximum value

(d) infinity.

47. A perfect gas is contained in a cylinder kept in vacuum. If the cylinder suddenly bursts, then the temperature of the gas

(a) is increased

(b) becomes zero K

(c) remains unchanged

(d) is decreased.

48. The hydrogen atom can give spectral lines in the Lyman, Balmer Paschen series. Which of the following statement is correct?

(a) Paschen series is in the visible region

(b) Lyman series is in the infra-red region

(c) Balmer series is (solely) in ultra violet-region

(d) Balmer series is in the visible region (partly).

49. A closed organ pipe and an open organ pipe of the same length produce four beats, when sounded together. If the length of the closed organ pipe is increased, then the number of beats will

(a) remains the same   (b) increase

(c) decrease   (d) first (d) then (a).

50. A permanent magnet attracts

(a) some substances and repels others

(b) all substances

(c) ferromagnetic substances and repels all other

(d) only ferromagnetic substances.

Directions: *These questions consist of two statements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses.*

(a) If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

(b) If both Assertion and Reason are true but Reason

is not a correct explanation of the Assertion.

(c) If Assertion is true but the Reason is false.

(d) If both Assertion and Reason are false.

51. *Assertion:* The frequencies of incident, reflected and refracted beam of monochromatic light incident from one medium to another are same.

Reason: The incident, reflected and refracted rays are coplanar.

52. *Assertion:* A laser beam of 0.2 W power can drill holes through a metal sheet, whereas a 1000 W torch-light cannot.

Reason: The frequency of laser light is much higher than that of torch light.

53. *Assertion:* A pulsar is a source of radio waves that varies in intensity at regular intervals.

Reason: A pulsar is a rorating neutron star.

54. *Assertion:* The relative velocity of two photons travelling in opposite direction is the velocity of light.

Reason: The rest mass of a photon is zero.

55. *Assertion:* The temperature coefficient of resistance is positive for metals and negative p-type semiconductors.

Reason: The effective charge carriers in metals are negatively charged whereas in p-type semiconductors they are positively charged.

56. *Assertion:* The ratio C_p/C_v is more for helium gas than for hydrogen gas.

Reason: All metals acts as black bodies.

57. *Assertion:* A hollow metallic closed container maintained at a uniform temperature can act as a source of black body radiation.

Reason: All metals act as black bodies.

58. *Assertion:* The square of the period of revolution of a planet is proportional to the cube of the semi-major axis of the ellipse

Reason: Sun's gravitational field is inversely proportional to the square of its distance from the planet.

59. *Assertion:* Environmental damage has increased the amount of ozone in the atmosphere.

Reason: Increase of ozone increases the amount of ultraviolet radiation on earth.

60. *Assertion:* Electric appliances with metallic body. e.g., heaters, presses etc., have three pin

connections, whereas an electric bulb has a two pin connection.

Reason: Three pin connections reduce heating of connecting cables.

CHEMISTRY

61. The percentage of oxygen in NaOH is
    (a) 16%   (b) 4%
    (c) 40%   (d) 8%.

62. Which of the following is the correct representation of relative lowering of vapour pressure ?
    (a) $\dfrac{P^0}{\Delta P} = \dfrac{P^0 - P}{P^0}$ (b) $\dfrac{P^0 - P}{P^0}$

    (c) $\dfrac{P^0}{P^0 - P}$ (d) $\dfrac{\Delta P}{P^0} = \dfrac{P^0 - P}{P^0}$

63. The number of moles of water present in 180 gm of water is
    (a) 18   (b) 5
    (c) 100   (d) 10.

64. What happens when chloroform is left open in air in the presence of sunlight ?
    (a) polymerisation takes place
    (b) explosion takes place
    (c) no reaction takes place
    (d) phosgene, a poisonous gas is formed.

65. Which of the following metal does not liberate H_2 from dilute H_2SO_4 ?
    (a) Zn   (b) Al
    (c) Cu   (d) Mg.

66. Glycerol is not used in
    (a) explosive   (b) cosmetics
    (c) soaps   (d) matches.

67. Which of the following is formed, when benzaldehyde reacts with alcoholic KCN ?
    (a) benzoin   (b) benzyl alcohol
    (c) benzoin acid (d) ethyl benzoate.

68. Ozonolysis of acetylene gives
    (a) HCHO   (b) CH_3CHO
    (c) CHO-CHO   (d) none of these.

69. Chlorine oxidises sodium thiosulphate to form
    (a) Na_2SO_3 (b) Na_2O
    (c) Na_2SO_4 (d) Na_2CO_3.

70. Which of the following is a characteristic of a reversible reaction ?

(a) it never proceeds to completion
(b) it can be influenced by a catalyst
(c) it proceeds only in forward direction
(d) number of moles of reactants and products are equal.

71. Bauxite, an ore of aluminium is purified by
    (a) Hall's process   (b) Serpek's process
    (c) Bayer's process   (d) all of these.

72. Blister copper is
    (a) alloy of copper   (b) pure copper
    (c) copper containing 1% impurity
    (d) ore of copper.

73. Which of the following gas molecules have equal total kinetic energy and translational kinetic energy ?
    (a) O_2 (b) He
    (c) CH_4 (d) N_2.

74. The pH of 0.001 (N) acetic acid solution, which is 10% dissociated, is
    (a) 3   (b) 1
    (c) 4   (d) 2.

75. The strongest bronsted base among the following anions is
    (a) ClO_3^- (b) ClO^-
    (c) ClO_4^- (d) ClO_2^-.

76. The boiling point of a compound is raised by
    (a) intermolecular hydrogen bonding
    (b) volatility of compound
    (c) intramolecular hydrogen bonding
    (d) non-polarity in the molecules.

77. Thermite is a mixture of
    (a) Zn + Mg   (b) Fe + Al
    (c) Fe_2O_3 + Al   (d) Cu + Mg.

78. Silicon is an important constituent of
    (a) alloys   (b) rocks
    (c) vegetables   (d) animals.

79. How many litres of ammonia gas at S.T.P. would be needed to prepare 100 ml of 2·5 M ammonium hydroxide solution ?
    (a) 5·6 lit   (b) 0·056 lit
    (c) 11·2 lit   (d) 0·56 lit.

80. A radioactive nuclide decays at such a rate that after 96 min, only 1/8th of the original amount remains. The value of half-life of the nuclide is
    (a) 32 min   (b) 12 min
    (c) 48 min   (d) 24 min.

81. The maximum number of electrons, present in an orbit that is represented by azimuthal quantum number $(l) = 3$, will be
(a) 8
(b) 2
(c) 14
(d) 6.

82. Which of the following compounds is known as white vitriol ?
(a) $ZnSO_4 \cdot 7H_2O$
(b) $CaCO_4 \cdot 2H_2O$
(c) $Na_2SO_4 \cdot 7H_2O$
(d) $MgSO_4 \cdot 7H_2O$.

83. Avogadro's number of oxygen atom weighs
(a) 32 g
(b) 8 g
(c) 56 g
(d) 16 g.

84. In the reaction sequence: $CaC_2 \xrightarrow{H_2O} A$ $\xrightarrow[HgSO_4]{dil\ HgSO_4} B \xrightarrow{H_2/Ni} C$, the term 'C' is
(a) CH_3CHO
(b) $HCHO$
(c) C_2H_5OH
(d) CH_3OH.

85. The equilibrium constant of a reaction is 300. If the volume of a reaction flask is trippled, the equilibrium constant will be
(a) 300
(b) 100
(c) 600
(d) 150.

86. Which of the following carbonium ion will be most stable ?
(a) $(CH_3)_2CH^+$
(b) CH_3^+
(c) $CH_3CH_2^+$
(d) $(CH_3)_3C^+$.

87. The volume of $3 \cdot 0$ N-H_2O_2 strength is
(a) 16.8 litres
(b) 4.2 litres
(c) 33.6 litres
(d) 8.4 litres.

88. Which of the following is the strongest base ?
(a) H_2^+
(b) H
(c) HCO_3^-
(d) H^-.

89. Bismuth chloride ($BiCl_3$), on hydrolysis, yields a white precipitate of
(a) bismuth hydroxide (b) bismuth oxyacid
(c) bismuth oxychloride
(d) none of these.

90. Ostwald's dilution law is applicable to only
(a) strong electrolytes (b) solute
(c) weak electrolytes (d) solvent.

91. Which of the following contains cobalt ?
(a) vitamin B_{12}
(b) haemoglobin
(c) chlorophyll
(d) vitamin D.

92. Which of the following is a sulphide ore ?

(a) carnallite
(b) magnetite
(c) copper pyrites
(d) malachite.

93. The pH value of human blood is about
(a) 4.5 to 5.6
(b) 2.3 to 3.4
(c) 7.3 to 7.5
(d) 3.5 to 4.3.

94. In the P^{3-}, S^{2-} and Cl^- ions, the increasing order of size is
(a) $S^{2-} < Cl^- < P^{3-}$
(b) $Cl^- < S^{2-} < P^{3-}$
(c) $S^{2-} < P^{3-} < Cl^-$
(d) $P^{3-} < S^{2-} < Cl^-$.

95. Absolute ether is diethyl ether, which
(a) is obtained from williamson's synthesis
(b) is mixed with absolute alcohol
(c) is totally free from moisture and peroxides
(d) contains trace of peroxide.

96. The number of molecules in $4 \cdot 25$ g of ammonia is approximately
(a) $3 \cdot 5 \times 10^{23}$
(b) $0 \cdot 5 \times 10^{23}$
(c) $2 \cdot 5 \times 10^{23}$
(d) $1 \cdot 5 \times 10^{23}$.

97. The rate, at which a substance reacts, depends upon its
(a) equivalent mass
(b) molecular mass
(c) active mass
(d) atomic mass.

98. The maximum energy is possessed by an electron, when it is present
(a) in first excited state
(b) in nucleus
(c) at infinite distance from the nucleus
(d) in ground energy state.

99. Which of the following compounds will undergo hydrolysis ?
(a) $NaNO_3$
(b) KCl
(c) NH_4Cl
(d) $NaCl$.

100. Which of the following is the correct sequence of atomic weights of the given elements ?
(a) Ni > Co > Fe
(b) Fe > Co > Ni
(c) Co > Fe > Ni
(d) Co > Ni > Fe.

101. Which of the following indicator is known as metal indicator ?
(a) phenolphthalein
(b) phenol red
(c) eriochrome-Black-T
(d) methyl orange.

102. Which of the following species is isotonic with $_{37}Rb^{86}$?
(a) $_{38}Sr^{87}$
(b) $_{36}Kr^{84}$
(c) $_{39}Y^{89}$
(d) $_{37}Mg^{85}$.

103. Hydrolysis of beryllium carbide produces
(a) acetylene   (b) methane
(c) ethene   (d) none of these.

104. If active mass of a 6% solution of a compound is 2, its molecular weight will be
(a) 30   (b) 15
(c) 60   (d) 22.

105. Which of the following molecules is paramagnetic?
(a) P_2O_5 (b) NO_2
(c) $H_2S_2O_7$ (d) N_2O_5.

106. The aqueous solution of which of the following salt will have the lowest pH ?
(a) $NaClO_3$ (b) $NaClO$
(c) $NaClO_4$ (d) $NaClO_2$.

107. In the reaction: $2P_2O_5 + 2HNO_3 \rightarrow P_4O_{10} + x$, the term x is
(a) N_2O_4 (b) H_2O only
(c) N_2O_5 (d) PNO_3.

108. If a neutral atoms is converted into a cation, then its
(a) atomic weight increases
(b) size increases
(c) atomic weight decreases
(d) size decreases.

109. Which of the following is urotropine ?
(a) hexamethylene tetramine
(b) hexamethyl-diamine
(c) heximethylene triamine
(d) none of these.

110. Which of the following alkanes is optically active?
(a) 3-methyl hexane   (b) propane
(c) 2, 3, 4-trimethyl pentane
(d) 2-methyl butane.

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

111. *Assertion*: In crystal lattice, size of the cation is larger in a tetrahedral hole than in an octahedral hole.

Reason: The cations occupy more space than anions in crystal packing.

112. *Assertion*: The enthalpy of formation of gaseous oxygen molecules at 298 K under a pressure of one atm is zero.
Reason: The entropy of formation of gaseous oxygen molecules under the same conditions is zero.

113. *Assertion*: Aniline hydrogen sulphate, on heating, forms a mixture of ortho and para amino benzene sulphonic acids.

Reason: The sulphonic acid group is electron withdrawing.

114. *Assertion*: The atoms in a covalent molecule are said to share electrons, yet some covalent molecules are polar.

Reason: In a polar covalent molecule, the shared electrons spend more time than the average near one of the atoms.

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

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

116. *Assertion*: Nitrogen is unreactive at room temperature but becomes reactive at elevated temperatures (on heating) or in the presence of catalysts.

Reason: In nitrogen molecules, there is extensive delocalization of electrons.

117. *Assertion*: Electrons are ejected from a certain metal when either blue or violet light strikes the metal surface. However, only violet light causes electron ejection from a second metal.

Reason: The electrons in the first metal require less energy for ejection.

118. *Assertion*: Sodium ions are discharged in preference to hydrogen ions at a mercury cathode.

Reason: The nature of cathode can affect the order of discharge of cations.

119. *Assertion*: A special line will be seen for a $2p_x \rightarrow 2p_y$ transition.

Reason: Energy is released in the form of waves of light when the electron drops from $2p_x$ to $2p_y$ orbital.

120. *Assertion*: Amongst the halogens, fluorine can oxidise the elements to the highest oxidation state.
Reason: Due to small size of fluoride ions, it is difficult to oxidise fluoride ions to fluorine. Hence reverse reaction takes place more easily.

BIOLOGY

121. The amphids are cuticular elevations on the ventro-lateral lips of *Ascaris*. These are
(a) tactoreceptors   (b) chemoreceptors
(c) olfactoreceptors   (d) tangoreceptors.

122. *Hydra* recognises its prey by
(a) chemical stimulus of prey
(b) nematocyst
(c) mechanical stimulus of prey
(d) some special organs.

123. The major constituent of vertebrate bone is
(a) potassium hydroxide
(b) sodium chloride
(c) calcium carbonate
(d) calcium phosphate.

124. The function of ductus choledochus is to carry
(a) urine   (b) ova
(c) sperms   (d) bile.

125. Which of the following gland controls egg production and moulting in insects ?
(a) corpus callosum   (b) corpora allata
(c) corpora cardiaca   (d) all of these.

126. Chordae tendinae are found in
(a) ventricles of brain (b) joints of legs
(c) ventricles of heart (d) atria of heart.

127. In mammals, the digestion of starch starts from
(a) oesophagus   (b) mouth
(c) duodenum   (d) stomach.

128. Which of the following is flightless bird ?
(a) ostrich   (b) emu
(c) kiwi   (d) all of these.

129. The camel's hump is composed of a tissue, which provides water when oxidised is, called
(a) areolar   (b) skeletal
(c) adipose   (d) muscular.

130. Wharton's duct is the duct of
(a) submandibular salivary gland
(b) parotid gland
(c) submaxillary gland
(d) all of these.

131. The horns of *Rhinoceros* are composed of
(a) chitin   (b) bone
(c) keratin   (d) cartilage.

132. Sharpey's perforating fibres are related with
(a) muscle contraction
(b) fixing of teeth
(c) heart contraction
(d) all of these.

133. Knock knee disease is due to
(a) deficiency in tyrosine amino acid
(b) hormonal imbalance
(c) excess fluoride concentration in water body
(d) genetical abnormality in males.

134. Sweat glands, in human skin, are located in the
(a) malpighian layer of epidermis
(b) dermis of skin
(c) subdermal layer of fat cells
(d) glandular layer of epidermis.

135. Where the conversion of harmful prussic acid into potassium sulphocyanide takes place ?
(a) bone marrow   (b) spleen
(c) lymph glands   (d) liver.

136. Which of the following is not applicable to coelenterates ?
(a) choanocytes   (b) coelenteron
(c) radial symmetry (d) nematoblasts.

137. Function of contractile vacuole in protozoa is
(a) osmoregulation (b) locomotion
(c) respiration   (d) digestion of food.

138. Animals belonging to order rodentia have
(a) long canines   (b) long incisors
(c) long molars   (d) short incisors.

139. How many teeth grow only once in the life of a man?
(a) 20   (b) 8
(c) 32   (d) 12.

140. Glycosidic link is broken in digestion of
(a) starch   (b) protein
(c) lipid   (d) all of these.

141. Which of the following is most convincing reasons for increasing population growth in a country ?
(a) low population of old people
(b) high birth rate
(c) high population of young children
(d) low mortality rate.

142. Radial symmetry is usually exhibited in animals, which
    (a) are aquatic
    (b) have ciliary mode of feeding
    (c) are attached to some substratum (sedentary).
    (d) none of these.

143. Which of the following has been declared a killer disease under Factory Act ?
    (a) tuberculosis   (b) asbestosis
    (c) shigellosis   (d) silicosis.

144. In *Gloriosa*, the tendrillar part is formed by
    (a) leaf petiole   (b) stipule
    (c) axillary bud   (d) leaf apex.

145. If PH of stomach is 1·6, then which enzyme will digest protein ?
    (a) amylase   (b) trypsin
    (c) erypsin   (d) pepsin.

146. When ovules at two points are developed, from the inner wall of the unilocular ovary, the placentation is called
    (a) marginal   (b) parietal
    (c) superficial   (d) basal.

147. Yellow bone marrow is found especially in the medullary cavity of
    (a) short bones   (b) spongy bones
    (c) long bones   (d) all of these.

148. Carbon dioxide is necessary for photosynthesis. The chemical used to remove this gas most effectively from entering a control apparatus is
    (a) calcium oxide   (b) distilled water
    (c) potassium hydroxide solution
    (d) sodium carbonate.

149. 'Sudan Black B' stain is used to stain
    (a) nucleic acid   (b) protein
    (c) polysaccharide   (d) lipid.

150. Life in biosphere is abundant between
    (a) 200 m below sea level to 6000 m above sea level
    (b) 6000 m below sea level to 6000 m above sea level
    (c) 11000 m below sea level to 9000 m above sea level
    (d) 6000 m below sea level to 2000 m above sea level.

151. Which of the following correctly represents the flow of genetic information ?

(a) DNA → RNA →protein
(b) RNA → DNA →protein
(c) RNA → protein → DNA
(d) protein → RNA → DNA.

152. Starch and cellulose are the compounds of many units of
    (a) amino acids   (b) glycerol
    (c) simple sugars   (d) fatty acids.

153. An ecological pyramid of biomass is the representation of the ecosystem's
    (a) energy flow through each trophic level
    (b) population in each food web
    (c) tissue organisation at each trophic level.
    (d) all of these.

154. Which part of the world has a high density of organisms ?
    (a) deciduous forests
    (b) grasslands
    (c) tropical rain forests
    (d) savannahs.

155. In a lake, the upper warmer oxygen rich circulating water layer zone is referred to
    (a) limnetic zone   (b) epilimnion
    (c) profundal zone   (d) hypolimnion.

156. Red Data Book deals with
    (a) plants on the verge of extinction
    (b) endemic plant
    (c) plants showing photoperiodism
    (d) plants that are extinct.

157. Which of the following is not a correct match ?
    (a) Aflatoxin - *Aspergillus parasiticus*
    (b) Bengal famine-*Helminthosporium*
    (c) Redrust of tea-*Melampsora*
    (d) Tikka disease of groundnut-*Cercospora*.

158. How many cytochromes are involved in the electron transport chain ?
    (a) five   (b) two
    (c) six   (d) four.

159. In gymosperm, the endosperm is a formed by
    (a) fusion of two polar nuclei
    (b) fertilised egg
    (c) fusion of one polar nucleus
    (d) germination of one megaspore.

160. Krantz anatomy is seen in
    (a) *Euphorbia hirta*
    (b) *Citrus indica*

(c) *Mangifera indica*
(d) *Zea mays.*

161. During photosynthesis, oxygen in glucose comes from
(a) oxygen in air   (b) water
(c) carbon dioxide   (d) both (b) and (c).

162. The niche of a population is the
(a) set of conditions that it interacts
(b) place where it lives
(c) set of conditions and resources it uses
(d) geographical area that it covers.

163. The best source of vitamin C is
(a) *Citrus indica*   (b) *Glycine max*
(c) *Emblica officinalis*
(d) *Arachis hypogea.*

164. The molar ratio of chlorophyll and xanthophyll is
(a) 4 : 1   (b) 3 : 1
(c) 1 : 1   (d) 2 : 1.

165. Shifting cultivation requires
(a) alternate crop pattern on a particular area
(b) huge amount of commercial fertiliser
(c) excessive soil erosion for crop production
(d) long time for the regeneration of soil.

166. Major source of sugar in the world is
(a) *Citrullus vulgaris* (b) *Beta vulgaris*
(c) *Saccharum officinarum*
(d) *Annona squamosa.*

167. *Penicillium* does not allow the growth of bacterium *Staphylococcus*. This sort of relationship is called
(a) commensalism   (b) antagonism
(c) ammensalism   (d) mutualism.

168. The reflectivity percentage of incident light on the earth is meteorologically called as
(a) reradiation   (b) tornado
(c) irrefraction   (d) albedo.

169. Plants which can withstand wide range of temperature tolerance are called
(a) monothermic   (b) stenothermic
(c) mesothermic   (d) eurythermic.

170. Which of the following is not a correct match?
(a) chord moss-*Funaria*
(b) maiden hair fern-*Ginkgo*
(c) walking fern-*Camptosorus*
d) bog moss-*Sphagnum.*

Directions: *These questions consist of two statements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses.*
(a) If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.
(b) If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.
(c) If Assertion is true but the Reason is false.
(d) If both Assertion and Reason are false.

171. *Assertion*: *Drosophila melanogaster* is widely used in genetic research.
Reason: *Drosophila melanogaster* is readily available insect.

172. *Assertion*: Genetic drift accentuates speciation.
Reason: Hardy-Weinberg equilibrium seems to retard speciation.

173. *Assertion*: Acetylcholine participates in the nerve impulse transmission across a synapse.
Reason: Acetylcholine is secreted by adrenergic fibres.

174. *Assertion*: The final reabsorption of water from urine into blood occurs through the collecting duct of a mammalian nephron, resulting in the production of hyperosmotic urine.
Reason: The loop of Henley is responsible for the formation of a sodium gradient across the depth of the cortical intersitium of a mammalian kidney.

175. *Assertion*: A correct concentration of auxin and cytokinin is required for the development of root and shoot in a callus.
Reason: When the ratio of kinetin to auxin is high, then only shoots develop. But when the ratio is low then only roots develop.

176. *Assertion*: Generally, a woman does not conceive during the lactation period.
Reason: The hormone 'prolactin' initiates and maintains lactation in a postpartum woman.

177. *Assertion*: Virus-free plants can be produced from virus infected plants by means of meristems tissue culture.
Reason: The virus fails to grow during the growth of host tissue in the artificial medium.

178. *Assertion*: Indiscriminate exploitation of economically important wild plants may lead to their extinction.

Reason: Non-conservation of their germplasm is responsible for this.

179. *Assertion*: Alpine forests consist of dwarf shrubs mainly of junipers, silver firs and rhododendrons.
Reason: Alpine forests occur in the Himalayas above the altitude of 3500 metres.

180. *Assertion*: *Azolla pinnata* is used as a biofertilizer in rice cultivation.
Reason: *Azolla* performs dinitrogen fixation with the help of symbiotic bacterium *Bacillus sp.*

GENERAL KNOWLEDGE

181. Which of the following state has the largest land area?
(a) Andhra Pradesh (b) Uttar Pradesh
(c) Madhya Pradesh (d) Maharashtra.

182. The Muslim league demanded a separate state for the Muslims in the year
(a) 1940 (b) 1920
(c) 1946 (d) 1930.

183. The term 'Carat' is used to express
(a) shape of gold (b) weight of gold
(c) purity of gold (d) type of gold.

184. The Mughal emperor who wrote his autobiography, was
(a) Humayun (b) Akbar
(c) Babar (d) Shahjahan.

185. The national award instituted for sport's coaches, is
(a) Dronachrya award (b) Arjun award
(c) Maulana Abul Kalam award
(d) Nehru award.

186. The Hall of Nation's, is located at
(a) Calcutta (b) Mumbai
(c) New Delhi (d) Madras.

187. The first sultan of Lodhi dynasty, was
(a) Bahlol Lodhi (b) Sikandar Lodhi
(c) Afzal Lodhi (d) Ibrahim Lodhi.

188. Sudden breaking of rock layers below the earth, results
(a) valconoes (b) floods
(c) earthquakes (d) cyclones.

189. Finance-commission is constituted after every
(a) four years (b) two years
(c) five years (d) three years.

190. 'Duck' is associated in which of the following sports?
(a) Cricket (b) Hockey
(c) Basket ball (d) Golf.

191. 'Tides' are caused by
(a) violent activity under the sea
(b) seismic vibrations under earth
(c) gravitational pull of the Sun and moon
(d) low pressure formed on the sea.

192. 'Lunar space craft' is used for
(a) study of the energy, liberated by Sun
(b) study of moon
(c) study of the earth from satellite
(d) transmission of radio signals.

193. Which of the following country, is the largest producer of copper?
(a) India (b) USA
(c) Russia (d) Japan.

194. Which of the following is the deepest lake in the world?
(a) Dal lake (b) Baikal lake
(c) Naini lake (d) Vooler lake.

195. In which of the following movement, Mahatma Gandhi gave the slogan 'Do or Die'?
(a) Quit India movement
(b) Dandi march
(c) non-coorperation movement
(d) Khilafat movement.

196. Which of the following is the capital of Denmark?
(a) Tokyo (b) Ottawa
(c) Copenhagen (d) Rome.

197. At which place did Mahavira got enligenment?
(a) Sarnath (b) Gaya
(c) Vaishali (d) Lumbani.

198. Battle of Haldighati was fought in
(a) 1756 A.D. (b) 1576 A.D.
(c) 1756 B.C. (d) 1576 B.C.

199. How many members in Rajya Sabha are nominated by the President of India?
(a) 12 (b) 10
(c) 13 (d) 11.

200. Who decides the question of disqualification of a Member of Parliament?
(a) supreme court (b) speaker
(c) election commission
(d) president.

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