SOLVED PAPER
AIIMS - 1998

Time : 3½ Hours Max. Marks : 200

PHYSICS

1. If the equation for the displacement of a particle moving on a circular path is given by $(\theta) = 2t^3 + 0.5$ where θ is in radians and t in seconds, then the angular velocity of the particleat $t = 2$sec, is
(a) 24 rad/sec (b) 12 rad/sec
(c) 8 rad/sec (d) 36 rad/sec

2. A body is projected at such an angle that the horizontal range is three times the greatest height. The angle of projection, is
(a) 42°8′ (b) 33°7′
(c) 25°8′ (d) 53°8′

3. The dimensions of angular velocity, is
(a) $[M^0L^0T^{-1}]$ (b) $M^2L^0T^{-1}]$
(c) $[MLT^{-2}]$ (d) $[ML^2T^{-2}]$

4. If the water falls from a dam into a turbine wheel 19.6 m below then the velocity of water at the turbine, is (Take g = 9.8 m/s^2)
(a) 39.2 m/s (b) 19.6 m/s
(c) 9.8 m/s (d) 98.0 m/s

5. A bullet is fired from a rifle. If the rifle recoils freely, then the kinetic energy of the rifle, is
(a) same as that of the bullet
(b) more than that of the bullet
(c) less than that of the bullet
(d) equal or less than that of the bullet

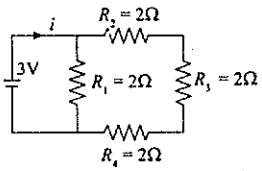
6. In an elliptically polarised light, the amplitude of the vibrations
(a) remains constant
(b) changes in direction only
(c) changes in magnitude only
(d) both (b) and (c)

7. The astronomical telescope consists of objective and eye-piece. The focal length of the objective, is
(a) shorter than that of the eye-piece
(b) greater than that of the eye-piece
(c) equal to that of the eye-piece
(d) five times shorter than that of the eye-piece

8. When hydrogen atom is in its first excited level, its radius, is
(a) twice (b) half
(c) same (d) four times

9. If a simple pendulum oscillates with an amplitude of 50 mm and time period of 2 sec, then its maximum velocity, is
(a) 0.8 m/s (b) 0.15 m/s
(c) 0.10 m/s (d) 0.16 m/s

10. What is the current (I) in the circuit, as shown in figure
(a) 1.2 A
(b) 0.5 A
(c) 1 A
(d) 2 A



11. Which of the following is not dependent on the intensity of incident radiation in a photo-electric experiment?
(a) stopping potential
(b) amount of photoelectric current
(c) work function of the surface
(d) maximum kinetic energy of photoelectrons

12. What is the area of the plates of a 3 F parallel plate capacitor, if the separation between the plates is 5 mm?
(a) 9.281×10^9 m^2 (b) 4.529×10^9 m^2
(c) 1.694×10^9 m^2 (d) 12.981×10^9 m^2

13. A spring 40 mm long is stretched by the application of a force. If 10 N force required to stretch the spring through 1 mm, then work done in stretching the spring through 40 mm, is
(a) 23 J (b) 68 J
(c) 84 J (d) 8 J

14. The waves in which the particles of the medium vibrate in a direction perpendicular to the direction of wave motion is known as

(a) propagated waves (b) longitudinal waves
(c) transverse wave (d) none of these

15. A sample of gas expands from volume V_1 to V_2. The amount of work done by the gas is greatest, when the expansion, is
(a) adiabatic (b) isobaric
(c) isothermal (d) equal in all cases

16. According to Maxwell's hypothesis, a changing electric field gives rise to
(a) magnetic field (b) electric current
(c) an e.m.f. (d) pressure radiant

17. If the radioactive decay constant of radium is 1.07×10^{-4} per year, then its half-life period is approximately equal to
(a) 6476 years (b) 7000 years
(c) 8900 years (d) 2520 years

18. If the kinetic energy of a body becomes four times of its initial value, then new momentum will
(a) become four times, its initial value
(b) become three times, its initial value
(c) become twice its initial value
(d) ramains constant

19. A quanity of heat required to change the unit mass of a solid substance, from solid state to liquid state, while the temperature remains constant, is known as
(a) hoar frost (b) sublimation
(c) latent heat (d) latent heat of fusion

20. Domain formation is the necessary feature of
(a) ferromagnetism (b) paramagnetism
(c) diamagnetism (d) all of these

21. A body of mass 5 kg is moving in a circle of radius 1 m with an angular velocity of 2 radian/sec. The centripetal force, is
(a) 30 N (b) 20 N
(c) 10 N (d) 40 N

22. The absolute zero is the temperature at which
(a) molecular motion ceases
(b) all substances exist in solid state
(c) water freezes (d) none of these

23. The best material for the core of a transformer, is
(a) hard steel (b) mild steel
(c) stainless steel (d) soft iron

24. Standing waves are produced in 10 m long stretched string. If the string vibrates in 5 segments and wave velocity is 20m/s, its frequency is
(a) 5 Hz (b) 4 Hz
(c) 2 Hz (d) 10 Hz

25. The kinetic energy of an electron, which is accelerated in the potential difference of 100 V, is
(a) 416.6 cal (b) 1.6×10^4 J
(c) 1.6×10^{-17} J (d) 6.636 cal

26. Newton's formula for the velocity of sound in gases, is
(a) $v = \sqrt{\frac{2p}{\rho}}$ (b) $v = \sqrt{\frac{p}{\rho}}$
(c) $v = \sqrt{\frac{\rho}{p}}$ (d) $v = \frac{3}{2}\sqrt{\frac{p}{\rho}}$

27. Light appears to travel in a straight line, because
(a) its wavelength is very small
(b) it is not absorbed by surrounding
(c) its velocity is very large
(d) it is reflected by surrounding

28. Gravitational mass is proportional to gravitational
(a) intensity (b) force
(c) field (d) all of these

29. If the period of oscillation of mass (M) suspended from a spring is 2 sec, then the period of mass $4M$ will be
(a) $3T$ (b) $2T$
(c) T (d) $4T$

30. The number of waves, contained in unit length of the medium, is called
(a) wave pulse (b) wave number
(c) elastic wave
(d) electromagnetic wave

31. Longitudinal strain is possible in
(a) gases (b) liquids
(c) solids (d) all of these

32. A Centigrade and a Fahrenheit thermometer are dipped in boiling water. The water temperature is lowered until the Fahrenheit thermometer registers 140°. The fall in temperature as registered by the Centigrade thermometer will be
(a) 60° (b) 40°
(c) 30° (d) 80°

33. Electroplating does not help in
(a) metals to become hard
(b) shining appearance
(c) fine finish to be surface
(d) protect metal againt corrosion

34. What is the relative humidity on a day, when partial pressure of water vapour is 0.012×10^5 Pa and temperature is 12°C? The vapour pressure of water at this temperature is 0.016×10^5Pa
(a) 68% (b) 52%
(c) 25% (d) 75%

35. Heat travels through vaccum by
(a) radiation (b) convection
(c) conduction (d) both (a) and (b)

36. Rocket engines lift a rocket from the earth surface, because hot gases with high velocity
(a) react against the rocket and push it up
(b) push against the air
(c) push against the earth
(d) heat up the air which lifts the rocket

37. A person using a lens as a simple microscope sees an
(a) upright virtual image
(b) inverted real magnified image
(c) inverted virtual image
(d) upright real magnified image

38. 'Mirage' is a phenomenone due to
(a) total internal reflection of light
(b) refraction of light
(c) reflection of light (d) diffraction of light

39. The rate of diffusion, is
(a) equal in solids, liquids and gases
(b) faster in liquids than in solids and gases
(c) faster in solids than in liquids and gasas
(d) faster in gases than liquids and solids

40. A transformer works on the principle of
(a) mutual induction (b) invertor
(c) convertor (d) self-induction

41. If a person with a spring balance and a body hanging from it goes up and up in an aeroplane, then the reading of the weight of the body as indicated by the spring balance, will
(a) first increase and then decrease
(b) go on decreasing
(c) go on increasing
(d) remain the same

42. On a cold morning, a metal surface will feel colder to touch than a wooden surfaces, because
(a) metal has low specific heat
(b) metal has high thermal conductivity
(c) metal has high specific heat
(d) metal has low thermal conductivity

43. Woollen clothes keep the body warm, because wool
(a) decreases the temperature
(b) increases the temperature of body
(c) is a bad conductor
(d) all of these

44. 'Stem corrections' in platinum resistance thermometres are eliminated by the use of
(a) compensating leads
(b) electrodes (c) cells
(d) none of these

45. Lines of force, due to earth's horizontal magnetic field, are
(a) concentric circles (b) curved lines
(c) elliptical (d) parallel & straight

46. If the luminous intensity of a unidirectional bulb is 100 candela, then total luminous flux emitted from the bulb, is
(a) 1256 lumen (b) 986 lumen
(c) 861 lumen (d) 1561 lumen

47. If the metal bob of a simple pendulum is replaced by a wooden bob, then its time period will
(a) remain the same (b) decrease
(c) increase (d) first (b) then (c)

48. The rain drops are spherical in shape due to
(a) thrust on drop (b) surface tension
(c) viscosity (d) residual pressure

49. A body can be negatively charged by
(a) giving some protons to it
(b) removing some electrons from it
(c) giving excess of electrons to it
(d) removing some neutrons from it

50. Electric potential of earth is taken to be zero, because earth is a good
(a) semi-conductor (b) conductor
(c) insulator (d) dielectric

Directions for Q. 51 to 60: *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) It 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 flase.

51. Assertion: A pulsar is a source of radiowaves that vary in intensity at regular intervals.
Reason: A pulsar is a rotating neutron star.

52. *Assertion:* A laser beam of 0.2 W can drill holes through a metal sheet whereas a 1000 W torch-light cannot.
Reason: The frequency of laser light in much higher than that of torch light.

53. *Assertion:* A body can have acceleration even if its velocity is zero at a given instant of time.
Reason: A body is momentarily at rest when it reverses its direction of motion.

54. *Assertion:* Virtual images are always erect.
Reason: Virtual images are formed by diverging lenses only.

55. *Assertion:* The ratio C_p/C_v for a diatomic gas is more than that for a monotomic gas.
Reason: The molecules of a monotomic gas have more degree of freedom than those of a diatomic gas.

56. *Assertion:* In series LCR circuit, the resonance is equal and opposite to the capacitive reactance.
Reason: At resonance the inductive reactance is equal and opposite to the capacitive reactance

57. Assertion: Radio waves can be polarised.
Reason: Sound waves in air are longitudinal in nature.

58. *Assertion:* In series LCR circuit, the resonance occurs at one frequency only.
Reason: At resonance the inductive reactance is equal and opposite to the capacitive reactance.

59. *Assertion:* Newton's rings are formed in the reflected system. When the space between the lens and the glass plate is filled with a liquid of refractive index greater than that of glass, the central spot of the pattern is bright.
Reason: This is because the reflections in these cases will be from a denser to a rarer medium and the two interfering rays are reflected under similar conditions.

60. *Assertion:* Corpuscular theory fails in explaining the velocities of light in air and water.
Reason: According to corpuscular theory, light should travel faster in denser media than in rarer media.

CHEMISTRY

61. Which of the following information can be obtained on the basis of Le Chatelier's principle?
(a) equilibrum constant of a chemical reaction
(b) dissociation constant of a weak acid
(c) entropy change in a reaction
(d) shift in equilibrium position on changing value of a constant

62. Which of the following is the most electropositive element?
(a) phosphorus (b) magnesium
(c) aluminium (d) sulphur

63. Which of the following explains the sequence of filling the electrons in different shells?
(a) Aufbau principle (b) Octate rule
(c) Hund's rule (d) all of these

64. The oxidation numbers of hydrogen in KH, MgH_2 and NaH are respectively
(a) + 2, + 1 and – 2 (b) + 1, + 1 and + 1
(c) – 1, – 1 and – 1 (d) – 2, – 3 and – 1

65. Which of the following does not show hydrogen bondin,
(a) N_2O (b) H_2O
(c) H_2S (d) Fe_3O_4

66. In the gas equation: PV = nRT
(a) V is the volume of one mole of the gas
(b) n no. of moles of the gas have volume V
(c) n is the number of molecules of the gas
(d) P is the pressure of one mole of the gas

67. 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

68. The physical adsorption of gases on the solid surface is due to
(a) van der Waals forces
(b) covalent bonding
(c) hydrogen bonding

(d) all of these

69. Which of the following salt has the same value of Vant's Hoff factor as that of $K_3[Fe(CN)_6]$?
(a) Na_2SO_4 (b) $Al(NO_3)_3$
(c) $Al_2(SO_4)_3$ (d) Fe_3O_4

70. Which of the following substances is used, in the laboratory, for fast drying of neutral gases?
(a) sodium sulphate
(b) phosphorus pentoxide
(c) sodium phosphate
(d) anhydrous calcium chloride

71. The equivalent weight of an acid is equal to
(a) molecular weight/basicity
(b) melecular weight × basicity
(c) molecular weight × acidity
(d) molecular weight/acidity

72. When the hybridization state of carbon atom changes from sp^3, sp^2 and sp, the angle between the hybridized orbitals
(a) decreases considerably
(b) increase progressively
(c) decreases gradually
(d) all of these

73. The most reactive compound, for the electrophilic nitration, is
(a) benzoic acid (b) nitrobenzene
(c) benzene (d) toluene

74. Hess' law is applicable for the determination of heat of
(a) transition (b) formation
(c) reaction (d) all of these

75. Which of the following has been universally accepted as a reference electrode at all temperatures and has been assigned a value of zero volt?
(a) platinum electrode
(b) copper electrode
(c) graphite electrode
(d) standard hydrogen electrode

76. The purification of alumina is called
(a) Baeyer's process (b) Bosch process
(c) Castuer process (d) Hoop's process

77. The boiling point of water (100°C) becomes 100.52°C, if 3 grams of a non-volatile solute is dissolved in 200 ml of water. The molecular weight of solute is (if K_b for water is = 0.6 K/m)
(a) 17.3 $g.mol^{-1}$ (b) 15.4 $g.mol^{-1}$
(c) 12.2 $g.mol^{-1}$ (d) 20.4 $g.mol^{-1}$

78. The product obtained when acetic acid is treated with phosphorus trichloride, is

(a) $CH_3-\overset{\overset{O}{\|}}{C}-Cl$ (b) $CH_3-\overset{\overset{O}{\|}}{C}-OCl$

(c) $CH_3-\overset{\overset{O}{\|}}{C}-O-PCl_2$

(d) $CH_3-CH_2-\overset{\overset{O}{\|}}{C}-OH$.

79. Which of the following is the main cause of late discovery of neutron?
(a) neutron in nucleus moves very fast
(b) neutron is highly unstable particle
(c) neutron is chargeless particle
(d) all of these

80. Which one of the following is used to make 'non-stick' cookware?
(a) poly-ethylene
(b) polytetrafluoroethylene
(c) polystyrene
(d) none of these

81. The reaction: benzene + methyl halide $\xrightarrow{\text{Anhy. } AlCl_3}$ Toluence, is known as
(a) Perkin's reaction (b) Wurtz reaction
(c) Kolbe's reaction (d) Friedel craft reaction

82. Ratio of the energy of a photon wavelengths 3000 Å and 6000 Å is
(a) 1 : 3 (b) 1 : 2
(c) 2 : 1 (d) 1 : 6

83. If a compound, on analysis was found to contain C = 18.5%, H = 1.55%, Cl = 55.04% and O = 24.81%, then its empirical formula is
(a) C_2H_2OCl (b) CH_2ClO
(c) CHClO (d) $ClCH_2O$

84. What is the oxidation number of sulphur in $Na_2S_4O_6$?
(a) $\frac{3}{5}$ (b) $\frac{3}{2}$
(c) $\frac{2}{5}$ (d) $\frac{5}{2}$

85. Nitrosoamines ($R_2N-N=O$) are soluble in water.

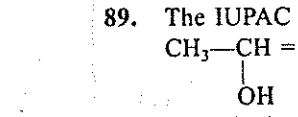
On heating them with concentrated H_2SO_4, they give secondary amines. This reaction is called
(a) Sandmeyer's reaction
(b) Fittig's reaction
(c) Perkin reaction
(d) Liebermann nitroso reaction

86. Acetamide is treated separately with the following reagent. Which one of these would give methylamine?
(a) Br_2 + NaOH (b) NaOH + Br_2
(c) KOH + Br_2 (d) none of these

87. The ionic product of water at 25°C is 10^{-14}. Its ionic product at 90°C will be
(a) 1×10^{-14} (b) 1×10^{-12}
(c) 1×10^{-20} (d) 1×10^{-16}

88. Ethanol and dimethyl ether form a pair of functional isomers. The boiling point of ethanol is higher than that of dimethyl ether, due to the presence of
(a) CH_3-group in ethanol
(b) H-bonding in dimethyl ether
(c) H-bonding in ethanol
(d) CH_3-group in dimethyl ether

89. The IUPAC name of the compound



(a) 4-hydroxy-4-pentenoic acid
(b) 4-hydroxy-3-pentenoic acid
(c) hydroxy pentenoic acid
(d) 4-hydroxy-4-methyl-3-ene-pentanoic acid

90. Baeyer's reagent is used in the laboratory for
(a) detection of glucose
(b) reduction process
(c) oxidation process
(d) detection of double bond

91. The functional group, which is found in amino acid, is
(a) – CH_3 group (b) – NH_2 group
(c) – COOH group
(d) both (b) and (c)

92. Principal quantum number of an atom is related to the
(a) orbital angular momentum
(b) spin angular momentum
(c) size of the orbital
(d) orientation of the orbital in space

93. A certain current liberated 0.504 g of hydrogen in 2 hours. How many grams of copper can be liberated by the same current flowing for the same time in copper sulphate solution
(a) 31.8 g (b) 16.0 g
(c) 12.7 g (d) 63.5 g

94. The solubility of $BaSO_4$, in water, is 2.33×10^{-3} gram/litre. Its solubility product will be (molecular weight of $BaSO_4$ = 233)
(a) 1×10^{-15} (b) 1×10^{-10}
(c) 1×10^{-5} (d) 1×10^{-20}

95. The reaction of primary amine with chloroform and ethanolic KOH, is called
(a) Reimer-Tiemann reaction
(b) Kolbe's reaction
(c) carbylamine reaction
(d) none of these

96. The rate constant of a reaction is $0.69 \times 10^{-2}\ min^{-1}$ and the initial concentration is 0.2 mol L^{-1}. The half-life period is
(a) 800 sec (b) 600 sec
(c) 400 sec (d) 6024 sec

97. One gram mole of a gas at N.T.P. occupies 22.4 litres. This fact was derived from
(a) law of gaseous volumes
(b) Dalton's atomic theory
(c) Avogadro's hypothesis
(d) law of constant proportions

98. An acyl halide is formed when PCl_5 reacts with
(a) amide (b) alcohol
(c) acid (d) ester

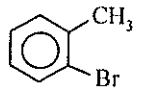
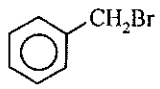
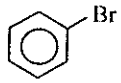
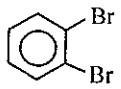
99. In the reaction: $4\ Fe + 3\ O_2 \rightleftharpoons 4\ Fe^{3+} + 6\ O_2^{2-}$ which of the following statement is incorrect?
(a) metallic iron is a reducing agent
(b) Fe^{3+} is an oxidising agent
(c) it is a redox reaction
(d) metallic iron is reduced to Fe^{3+}

100. If enthalpies of formation for $C_2H_{4\,(g)}$, $CO_{2\,(g)}$ and $H_2O_{\,(l)}$ at 25°C and 1 atm pressure are 52, – 394 and – 286 kJ/mol respectively, then enthalpy of combustion of $C_2H_{4\,(g)}$ will be
(a) – 141.2 kJ/mol (b) + 14.2 kJ/mol
(c) + 141.2 kJ/mol (d) – 1412 kJ/mol

101. A compound with empirical formula CH_2O has a vapour density of 30. Its molecular formula is
(a) $C_3H_6O_3$ (b) $C_2H_4O_2$

(c) $C_2H_2O_2$ (d) $C_6H_{12}O_6$

102. An equilibrium mixture of the reaction $2H_2S_{(g)} \rightleftharpoons 2H_{2(g)} + S_{2(g)}$, had 0.5 mole H_2S, 0.10 mole H_2 and 0.4 mole S_2 in one litre vessel. The value of equilibrium constant (K) in mole litre^{-1} is
(a) 0.016 (b) 0.008
(c) 0.004 (d) 0.160

103. Which of the following compounds is 2-bromotoluene?
(a)  (b) 
(c)  (d) 

104. At what pressure will a quantity of gas, which occupies 100 ml at a pressure of 720 mm, occupy a volume of 84 ml
(a) 820.20 mm (b) 784.15 mm
(c) 736.18 mm (d) 857.14 mm

105. Which of the following elements are analogous to the lanthanides?
(a) carbides (b) borides
(c) actinides (d) hydrides

106. In an endothermic reaction, the value of change in enthalpy (ΔH) is
(a) zero (b) negative
(c) positive (d) either (b) or (c)

107. Which one of the following shows maximum paramagnetic character?
(a) $[Fe(CN)_6]^{3-}$ (b) $[Fe(CN)_6]^{4-}$
(c) $[Cr(H_2O)_6]^{3+}$ (d) $[Cu(H_2O)_6]^{2+}$

108. The specific conductance of a N/10 KCl at 25°C is 0.0112 ohm^{-1} cm^{-1}. The resistance of cell containing solution at the same temperature was found to be 55 ohms. The cell constant will be
(a) 6.16 cm^{-1} (b) 0.616 cm^{-1}
(c) 0.0616 cm^{-1} (d) 616 cm^{-1}

109. Plank's constant has the same dimension as that of
(a) radiant energy (b) work
(c) power
(d) angular momentum

110. Which of the following is the most stable alkene?
(a) $RCH_2 = CH_2R$ (b) $RCH = CHR$
(c) $R_2C = CR_2$ (d) $CH_2 = CH_2$

Directions for Q. 111 to 120: *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) It 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 is false.

111. *Assertion:* The energy of an electron is largely determined by its principal quantum number.
Reason: The principal quantum number (n) is a measure of the most probable distance of finding the electrons around the nucleus.

112. *Assertion:* The of a gas does not change, when it undergoes an adiabatic expansion.
Reason: During an adiabatic process, the container should be a perfect conductor.

113. *Assertion:* The 19th electron in potassium atom enters into the 4s-orbital and not into the 3d-orbital.
Reason: $(n + 1)$ rule is followed for determining the orbitals of the lowest energy state

114. *Assertion:* For an ideal gas, at constant temperature, the product of the pressure and volume is a constant.
Reason: The mean square velocity of the molecules is inversely proportional to mass.

115. *Assertion:* Heat energy is completely transformed into work during the isothermal expansion of a gas.
Reason: During an isothermal process, the changes in internal energy of a gas due to decrease in pressure is nullified by the changes due to increase in volume.

116. *Assertion:* Both chlorine and sulphur dioxide act as bleaching agents.
Reason: Chlorine bleaches by vigorous exidation, while sulphur dioxide bleaches by mild reduction.

117. *Assertion:* A solution of sucrose in water is dextro-rotatory. But on hydrolysis in the presence of a little hydrocholoric 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.

118. *Assertion*: Di-nitrogen in chemically unreactive at ordinary temperature and is very stable.
Reason: The bond dissociation energy is 946 kJ mol^{-1}

119. *Assertion:* Bond order in a molecule, which can assume any value positive or negative, integral or fractional including zero.
Reason: Bond order depends on the number of electrons in the bonding and antibonding orbitals

120. *Assertion:* Alkali metals impart colour to the flame.
Reason: Their ionisation energies are low.

BIOLOGY

121. Photorespiration, usually occurs in
(a) one-cell organelles only
(b) two-cell organelles
(c) three-cell organelles
(d) four-cell organelles.

122. In *Selaginella*, reduction division occurs during the formation of
(a) sperms (b) microspores only
(c) megaspores only (d) both (b) and (c).

123. The term chromatophore was coined by
(a) Schmitz (b) Comparethi
(c) W. Pfeiffer
(d) Singer and Nicholsan

124. The sphere of living matter together with water, air and soil on the surface of earth is called
(a) atmosphere (b) hydrosphere
(c) lithosphere (d) biosphere.

125. Which type of cancer is found in lymph nodes and spleen?
(a) carcinoma (b) sarcoma
(c) leukaemia (d) lymphoma.

126. Which of the following terms is not concerned with genetic recombination in bacteria?
(a) Transformation (b) Transduction
(c) Translation (d) Conjugation.

127. The process of the escape of liquid from the tip of uninjured leaf is called
(a) guttation (b) transpiration
(c) evaporation (d) evapo-transpiration

128. Moderate rainfall during summer produces
(a) desert (b) grasslands
(c) scrub forests (d) deciduous forests.

129. Phenomenon of Industrial melanism demonstrates
(a) natural selection (b) induced mutation
(c) geographical isolation
(d) reproductive isolation.

130. When the gametophyte is not formed by spores but by any other part of sporophyte, it is known as
(a) multispory (b) polyspory
(c) apospory (d) germination.

131. Middle piece of a mammalian sperm contains
(a) nucleus (b) centriole
(c) mitochondria (d) vacuole.

132. The black pigment in the eye, which reduces the internal reflection, is located in
(a) retina (b) iris
(c) sclerotic (d) cornea.

133. The placenta of human beings belong to the category of
(a) haemo-chorialis (b) syndesmo-chorialis
(c) endothelio-chorialis
(d) epithelio-chorialis.

134. Antiserum contain
(a) anitgens (b) leucocytes
(c) antibodies (d) none of these.

135. A mature ligule, having a prominent basal portion, is called
(a) trichocyst (b) heterocyst
(c) rhizophore (d) Glossopodium.

136. Pollination by snail and slug is known as
(a) ornithophilous (b) chiropterophilous
(c) entomophilous (d) malacophilous.

137. Which of the following RNAs picks up specific amino acid from amino acid pool in the cytoplasm to ribosome during protein synthesis?
(a) t-RNA (b) m-RNA
(c) r-RNA (d) all of these.

138. Primitive types of stomata are found in the
(a) apophysis of capsule
(b) leaves of moss plants
(c) axes of the moss plant
(d) all of these.

139. Single filament of Nostoc without mucilage sheath is known as
(a) mycelium (b) colony
(c) trichome (d) hyphae.

140. Secretion of which of the following is under neurosecretory nerve axons?
(a) Pineal (b) Adrenal cortex
(c) Anterior pituitary (d) Posterior pituitary.

141. Sensation of stomach pain is due to
(a) interoceptors (b) exteroceptors
(c) proprioceptors (d) teloreceptors.

142. Addison's disease results from
(a) hyposecretion of adrenal
(b) hypertrophy of gonads
(c) hyperactivity of cells of Leydig
(d) none of these.

143. Galapagos islands are associated with the name of
(a) Wallace (b) Malthus
(c) Darwin (d) Lamarck.

144. Pacinian corpuscles occur in the skin of certain parts of body in mammals. These are
(a) type of glands (b) pain receptors
(c) naked tactile receptors
(d) encapsulated pressure receptors.

145. Which of the following disease is due to an allergic reaction?
(a) Goitre (b) Enteric fever
(c) Skin cancer (d) Hay fever.

146. Sympathetic nerves in mammals arise from
(a) sacral-region (b) cervical region
(c) thoraco-lumbar region
(d) 3^{rd}, 7^{th}, 9^{th} and 10^{th} cranial nerves.

147. In nucleoplasm, a conspicuous body of spherical shape attached to a particular chromosome on a definite position is called
(a) plasmid (b) karyolymph
(c) nucleolus (d) nuclear reticulum.

148. Which of the follwing is dissolved in water for making Bordeaux mixture?
(a) calcium chloride (b) copper sulphate
(c) sodium chloride (d) none of these.

149. A plant cell has potential to develop into full plant. This property of the plant cell is called
(a) tissue culture (b) totipotency
(c) pleuripotency (d) gene cloning.

150. The relationship in an ecosystem can be depicted in
(a) pyramid of energy
(b) pyramid of biomass
(c) pyramid of numbers
(d) all of these.

151. The proper scientific name of cellobiose is
(a) 4-O-β-D-glucopyranosyl-D-α-glucopyranose
(b) 8-O-β-D-glucopyranosyl-D-glucose
(c) $4NH_2SO_4$-β-D-reductase
(d) $6NH_2PO_4$-α-D-reductase.

152. The plant material, which is widely used in the preparation of culture medium, is
(a) *Cycas revoluta* (b) *Cocos nucifera*
(c) *Pinus longifolia* (d) *Borassus flabellifer.*

153. The chief function of pholem is the conduction of
(a) food (b) mineral
(c) water (d) air.

154. Phytotron is a device by which
(a) mutations are produced in plants
(b) plants are grown in controlled environment
(c) protons are liberated
(d) leaf fall occurs on abscission layer.

155. Which of the following is nongenetic, and is utilised for protein synthesis?
(a) *t*-RNA (b) *Z*-RNA
(c) *m*-RNA (d) none of these.

156. Which of the following is not correctly matched?
(a) Root knot disease–*Meloidogyne javanica*
(b) Smut of bajra–*Tolysporium penicillariae*
(c) Covered smut of barley–*Ustilago nuda*
(d) Late blight of potato–*Phytophthora infestans.*

157. Passive immunity is defined as immunity
(a) inherited from the parents
(b) achieved through vaccination
(c) acquired through first exposure to the disease
(d) achieved through the sera of other animals enriched in anitbodies.

158. The structure, which remains unchanged during metamorphosis of frog's tadpole, is
(a) lung (b) heart
(c) intestine (d) nervous system.

159. Cells of deiter occur in
(a) utriculus (b) retina of eyes
(c) organ of corti (d) sebaceous glands.

160. The cells named podocytes occur in
(a) glomerulus of kidney
(b) wall of capillaries
(c) neck region of nephrons
(d) large intestine.

161. Malathion, parathion and fenitrothion belong to group of
(a) triazines (b) carbamates
(c) pyretheroids (d) organophosphate.

162. Immidiately after ovulation, the mammalian egg is covered by a membrane known as
(a) chorion (b) zona pellucida
(c) corona radiata (d) vitelline membrane.

163. Treatment with 'Alloxan' destroys
(a) STH cells
(b) β-cells of islets of Langerhans
(c) cells of Sertoli (d) cells of Leydig.

164. Distance between two linked genes upon a chromosome is measured in cross over units, is
(a) ratio of crossing over between them
(b) cross-over value
(c) number of other genes between them
(d) none of these.

165. The genes, which are confined to differential region of Y-chromosome only, are called
(a) mutant (b) autosomal
(c) holandric (d) sex-linked.

166. Eggs having yolk in their centre of cytoplasm in peripheral layer, are called
(a) isolecithal (b) microlecithal
(c) centrolecithal (d) telolecithal.

167. Arbor vitae is composed of
(a) grey matter (b) neuroglial cells
(c) white matter (d) both (a) and (c).

168. Termination of gastrulation is marked by
(a) obliteration of archenteron
(b) closure of neural tube
(c) obliteration of blastocoel
(d) closure of blastocoel.

169. Mechanism of uric acid excretion in a nephron, is
(a) osmosis (b) diffusion
(c) secretion (d) ultrafiltration.

170. Most primitive living mammals, which provide an evidence of organic evolution from geographical distribution are found in
(a) China (b) India
(c) Australia (d) Africa.

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 Assertion is false and Reason is true.

171. *Assertion* : Transmission of the nerve impulse across a synapse is accomplished by neurotransmitters.
Reason : Transmission across a synapse usually requires neuro-transmitters because there is small space. i.e., synaptic cleft, that separates one neuron from another.

172. *Assertion* : All terrestrial mammals are air breathers.
Reason : Because of terrestrial habitat, they have well-developed lungs for air breathing.

173. *Assertion* : There is no chance of transmission of malaria to man on the bite of a male *Anopheles* mosquito.
Reason : It carries a non-virulent strain of *Plasmodium*.

174. *Assertion* : Thiamin deficiency results in beri-beri causing paralysis.
Reason : People eating raw fish may also suffer from paralysis due to the dificiency of vitamin B_1. Cooked fish has no such effect.

175. *Assertion* : Minerals are not part of biologically active substances.
Reason : Some individuals suffer anaemia due to the deficiency of iron.

176. *Assertion* : Winged bean is widely cultivated throughout India.
Reason : The protein content in the seeds of winged bean is low.

177. *Assertion* : Meiotic division results in the production of four dissimilar cells.
Reason : Synapses occurs during zygotene of meiosis.

178. *Assertion* : Auxillary buds, in actively growing herbaceous plants generally remain dormant.
Reason : This is due to apical dominance which is under the influence of auxins.

179. *Assertion* : Lysosomes help in the process of photorespiration.
Reason : Lysosomes have acidic enzymes.

180. *Assertion* : Endomycorrhiza of forest trees contribute to the efficient nutrient cycling in tropical forest ecosystems.

Reason : The fungi that form endomycorrhizal associations with plants store nutrient ions and make them available to the host plants.

GENERAL KNOWLEDGE

181. The simon-commission came in which of the following year?
(a) 1939 (b) 1927
(c) 1942 (d) 1932.

182. At present, the total membership of Lok Sabha is
(a) 527 (b) 552
(c) 521 (d) 545.

183. 'JAVA' is a
(a) American intelligence agency
(b) name of tribes, who lives in the interior part of Orissa
(c) computer programming language
(d) none of these.

184. National Housing Bank is a subsidiary of
(a) I.C.I.C.I. (b) S.B.I.
(c) R.B.I. (d) I.D.B.I.

185. 'Frank Worrell' was associated with which of the following sport?
(a) cricket (b) hockey
(c) swimming (d) football.

186. What is Nikkie?
(a) a private firm situated in Japan
(b) currency of Korea
(c) index of share prices in Tokyo stock exchange
(d) rate of interest of fered by Bank of Tokyo.

187. The largest airport in the word in situated in
(a) Saudi Arabia (b) USSR
(c) Denmark (d) USA.

188. Swami Vivekanand was born in which of the following year?
(a) 1897 (b) 1863
(c) 1902 (d) 1892.

189. The Commonwealth games of 1998 were hosted by
(a) England (b) Singapore
(c) Australia (d) Malaysia.

190. Which of the following state, becomes the 22nd state of Indian Union ?
(a) Meghalaya (b) Sikkim
(c) Arunachal Pradesh (d) Tripura.

191. 'Sambalpur' is situated on the bank in which of the following river?
(a) Sarya (b) Jamuna
(c) Mahanadi (d) Saraswati.

192. The dynasty of Bahadur Shah (II) Jafar was in
(a) 1857 to 1862 A.D.
(b) 1837 to 1857 A.D.
(c) 1800 to 1829 A.D.
(d) 1658 to 1707 A.D.

193. Sixth five-year plan to promote significant expansion of employment opportunities was scheduled in the year of
(a) 1974-79 (b) 1961-66
(c) 1980-85 (d) 1969-74.

194. Hindi Day is observed on
(a) 29th August (b) 12 April
(c) 14th September (d) 2 May.

195. 'Lira' is the currency of which of the following country?
(a) Turkey (b) Spain
(c) Philippines (d) Vietnam.

196. Sixty first amendment in the constitution, states about
(a) reducing the voting age from 21 years to 18 years
(b) extended president rule in Punjab
(c) increasing the ceilling of profession tax
(d) reservation of seats for scheduled castes and scheduled tribes in parliament.

197. Which of the following book is written by Sarojini Naidu?
(a) Broken wing (b) Chitra
(c) Great Tragedy (d) Gandevta.

198. India's multi-target surface-to-air missile is known as
(a) Akash (b) Nag
(c) Prithvi (d) Agni.

199. Which of the following is the biggest cave temple in India?
(a) Tuljapur (b) Ajanta
(c) Parli (d) Ellora.

200. Beighton cup in India is associated with
(a) volley ball (b) cricket
(c) basket ball (d) hockey.

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