e Medical Prep

Model Test Paper-8
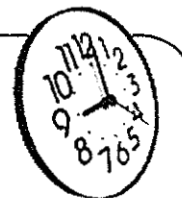
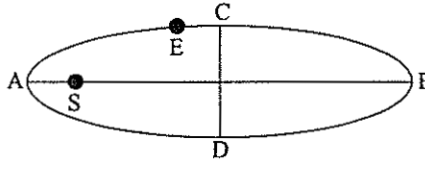*Time :* $3\frac{1}{2}$ *hours.*   *Maximum Marks :* 200

PHYSICS

1. The refractive indices of the material of lens for violet, yellow and red colours of light are 1.66, 1.64 and 1.62 respectively, the mean focal length of the lens is 10 cm, then chromatic aberration of the lens between the violet and the red colours is
   (a) 0.857   (b) 0.825
   (c) 0.625   (d) 1.0

2. Which one of the following nuclear reactions is a source of energy in the sun?
   (a) $_{56}Ba^{144} + {}_{36}Kr^{92} \rightarrow {}_{92}U^{235} + {}_0n^1$
   (b) $_2He^3 + {}_2He^3 \rightarrow {}_2He^{14} + {}_0H^1 + {}_1H^1$
   (c) $_4Be^9 + {}_2He^4 \rightarrow {}_6C^{12} + {}_0n^1$
   (d) $_{24}Fe^{56} + {}_{43}Ca^{112} \rightarrow 167 \, {}_{74}W^{92} + {}_0n^1$

3. If an electron is moving with a speed of 3×10^7 m/s perpendicular to a uniform magnetic field of flux density 0.002 Wb.m², then the radius of the path is
   (a) 0.084 m   (b) 0.064 m
   (c) 0.038 m   (d) 0.090 m

4. When a sound wave travels from air to water, which of these remains constant?
   (a) wavelength   (b) frequency
   (c) velocity   (d) all of these

5. A straight line conductor of length 0.4 m is moved with a speed of 7 m/s perpendicular to a magnetic field of intensity 0.9 Wb/m². The induced e.m.f. across the conductor is
   (a) 5.04 V   (b) 2.52 V
   (c) 1.26 V   (d) 25.2 V

6. In an intrinsic semiconductor, the fermi level varies linearly with the
   (a) thermal conductivity
   (b) pressure
   (c) temperature
   (d) none of these

7. An electron is moving with velocity 10^6 m/s in a circular path of radius 0.0077 m in a magnetic field of 10^{-3} Wb/m². The value of e/m for the electron is
   (a) 1.9×10^{11} C/kg   (b) 1.35×10^{11} C/kg
   (c) 1.29×10^{11} C/kg   (d) 2.6×10^{11}C/kg

8. The coefficient of thermal conductivity of a metal depends upon
   (a) thickness of metal plate
   (b) temperature difference between two sides
   (c) area of plate
   (d) all of these

9. A conducting rod is rotated with angular velocity ω in a horizontal plane perpendicular to a uniform magnetic induction B. The induced e.m.f. is
   (a) ωBI (b) $\dfrac{\omega BI^2}{2}$
   (c) $\dfrac{BI}{\omega}$ (d) $\dfrac{\omega^2 BI}{2}$

10. A block of wood is floating in a water tank. The loss of weight of the floating block is equal to
    (a) remains same
    (b) greater than the weight of block
    (c) weight of block
    (d) none of these

11. The internal energy of a real gas depends upon

(a) pressure   (b) volume

(c) temperature   (d) both (b) and (c)

12. The essential distinction between X-rays and γ-rays is that the γ-rays
    (a) have greater ionizing power than X-rays
    (b) emanate from nucleus, while X-rays emanate from outer part of the atom
    (c) have smaller wave-length than X-rays
    (d) are more penetrating than X-rays.

13. Which of the following mirror is used by dentist to examine a small cavity?
    (a) convex mirror
    (b) concave mirror
    (c) combination of 'a' and 'b'
    (d) none of these

14. The earth E moves in an elliptical orbit with the Sun S at one of the focii as shown in figure. Its speed of motion will be maximum at the point
    (a) B
    (b) A
    (c) C
    (d) D

15. A space-station is set-up in space at a distance equal to earth's radius from the surface of earth. Suppose a statellite can be launched from the space station also. If v_1 and v_2 be the escape velocities of the satellite on the earth's surface and space station respectively, then
    (a) $v_2 = v_1$ (b) $v_2 < v_1$
    (c) $v_2 > v_1$ (d) $v_1^2 = v_2^2$

16. Current I_0 flows through a solenoid of length L having N number of turns, when it is connected to a DC e.m.f. If charged particle is projected along the axis of solenoid with a speed v_0, then the force on the charged particle in the solenoid
    (a) remains same   (b) decreases
    (c) increases   (d) becomes zero

17. In the arrangement of resistances shown below, the effective resistance between points A and B is
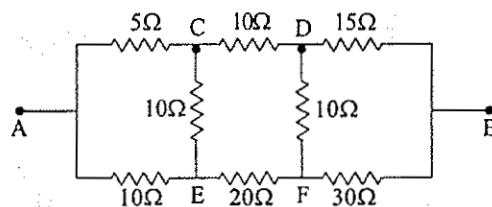
    (a) 90 W   (b) 30 W
    (c) 20 W   (d) 110 W

18. Latent heat is defined as the amount of heat absorbed or given out by a body during a change of state, while its
    (a) volume remains constant
    (b) temperature remains constant
    (c) pressure remains constant
    (d) none of these

19. A beam of light of wave length λ and illumination L falls on a clean surface of sodium. If n photo electrons are emitted and each has a kinetic energy E, then
    (a) $n \propto \lambda$ and $E \propto L$ (b) $n \propto L$ and $E \propto \dfrac{1}{\lambda}$

    (c) $n \propto L$ and $E \propto \lambda$ (d) $n \propto \dfrac{1}{\lambda}$ and $E \propto \dfrac{1}{L}$

20. The phenomenon of beats is not observed in the case of visible light waves, because the difference between the two interfering frequencies
    (a) has no difference   (b) is very high
    (c) is very small   (d) none of these

21. An aluminium sphere of 10 cm radius is heated from 0°C to 100°C. The change in its volume
    (a) 22.6 cm³   (b) 12.3 cm³
    (c) 2.0 cm³   (d) 28.9 cm³

22. Two small spheres each carrying a charge q are placed r metre apart. If one of the spheres is taken around the other in a circular path, then work done will be equal to
    (a) πp (b) $2\pi p$

(c) $2\pi\rho^2$ (d) zero

23. The electric current, passing through a metallic wire produces heat, because of
    (a) the energy released in the ionization of the atoms of the metal
    (b) collision of the atoms of the metal with each other
    (c) collisions of conduction electrons with each other
    (d) collisions of the conduction electrons with the atoms of the metallic wire.

24. Find the ratio of period of rotation of planet (Mars) about the Sun with that of the Earth around it. The mean distance of the Mars from the Sun is 1.42 A.U. and distance of earth from the sun = 1 A.U.
    (a) 1.692 : 2   (b) 1 : 1.692
    (c) 1.692 : 1   (d) 2 : 1.692

25. Electrical conductivities of Ge and Na are σ_1 and σ_2 respectively. If these substances are heated, then
    (a) σ_1 decreases and σ_2 increases
    (b) both σ_1 and σ_2 decreases
    (c) both σ_1 and σ_2 increase
    (d) σ_1 increases and σ_2 decreases

26. If the cross-sectional area of a pipe line increases, the velocity of the flow of liquid
    (a) become zero   (b) decreases
    (c) increases   (d) remains same

27. The excess pressure inside a soap bubble of radius (R) and surface tension (T) is
    (a) $P = \dfrac{3T}{R}$ (b) $P = \dfrac{4T}{R}$
    (c) $P = \dfrac{2T}{R}$ (d) $\dfrac{8T}{R}$

28. A black body radiates heat energy at the rate of 2×10^5 J/s-m² at the temperture of 120°C. Temperature of the black body at which rate of heat radiation is 32×10^5 J/s-m² is
    (a) 400 K   (b) 600 K
    (c) 800 K   (d) 200 K

29. Which of the following is not the characteristic of SHM?
    (a) displacement time graph is a sine curve
    (b) periodic nature
    (c) projection of uniform circular motion on any straight line
    (d) acceleration zero at the mean position

30. Slope of an adiabatic curve is always
    (a) equal to isothermal curve
    (b) less than isothermal curve
    (c) greater than isothermal curve
    (d) either 'b' or 'a'

31. The value of the square of sum of two vectors $\vec{A}$ and $\vec{B}$ with θ as the angle between them is
    (a) $\sqrt{A^2 + B^2 - 2AB\sin\theta}$
    (b) $\sqrt{A^2 - B^2 + 2AB\cos\theta}$
    (c) $\sqrt{A^2 + B^2 + 2AB\cos\theta}$
    (d) $\sqrt{A^2 + B^2 + 2AB\sin\theta}$

32. A disc of mass 3 kg is rolling on a horizontal surface with a velocity 0.3 m/s. The total kinetic energy of the disc should be
    (a) 0.98J   (b) 0.35J
    (c) 0.20J   (d) 1.26J

33. Myopia is corrected by
    (a) bifocal lens   (b) concave lens
    (c) convex lens   (d) cylindrical lens

34. If the plate resistance of a triode valve is 3×10^3 Ω and amplification factor (μ) is 8, the value of mutual conductance is
    (a) $3.6 \times 10^{-4}\Omega^{-1}$ (b) $2.6 \times 10^{-3}\Omega^{-1}$
    (c) $1.5 \times 10^{-2}\Omega^{-1}$ (d) $6.3 \times 10^{-3}\Omega^{-1}$

35. When we connected a voltmeter across the terminals of a cell, it measures 6 V. If a resistance of 2 ohms is connected across the terminals of a cell as shown in the figure, then current flowing through this resistance (R) will be
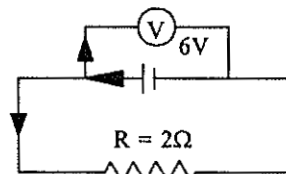
(a) 5A   (b) 3A
(c) 2A   (d) 7.5A

36. If a man pulls a cart of mass 100 kg with an acceleration of 2 m/sec², then force exerted by the man is
(a) 600 N   (b) 400 N
(c) 200 N   (d) 800 N

37. For steel, the breaking stress is 6×10^6 N/m² and the density is 8×10^3 kg/m³. The maximum length of steel wire, which can be suspended without breaking under its own weight is ($g = 10$ m/s²)
(a) 140 m   (b) 120 m
(c) 75 m   (d) 200 m

38. One light-year is approximately equivalent to
(a) 10^{18} m   (b) 10^{16} m
(c) 10^{14} m   (d) 10^{20} m

39. A 10 A ammeter has a resistance of 0.09 Ω. What resistance of the shunt will enable it read 100 A?
(a) 0.09 Ω   (b) 9 Ω
(c) 1 Ω   (d) 0.01 Ω

40. A sphere of mass 50 kg is attracted by a second sphere of mass 90 kg with a force equal to a weight of 0.5 mg and their centres are 20 cm apart. The gravitational constant is (weight of sphere = 10^{-6} kg)
(a) 3.3×10^{-11} Nm² kg⁻²
(b) 6.23×10^{-15} Nm² kg⁻²
(c) 4.2×10^{-11} Nm² kg⁻²
(d) 4.36×10^{-11} Nm² kg⁻²

Instructions for Q. No. 41 to 60

Directions : Each of the questions given below consists of two statements, an assertions (A) and reason (R). Select the number corresponding to the appropriate response in the answer sheet as follows.

(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 the reason is not a correct explanation of the assertion

(c) If the assertion is true, but the reason is false

(d) If both assertion and reason are falses

41. *Assertion (A) :* A balloon stops rising after attaining a certain maximum height.
Reason (R) : Upthrust due to air decreases with height till it just balances the weight of the balloon.

42. *Assertion (A) :* In series A.C. circuit, the voltage across the combination of capacitor and inductor is zero at resonance.
Reason (R) : At series resonance the current in the circuit is zero.

43. *AAssertion (A) :* It is necessary to use artificial satellite for long distance TV transmission.
Reason (R) : Ionospheric disturbances are minimised by satellite communication.

44. *Assertion (A) :* A table cloth can be pulled from a table without dislodging the dishes.
Reason (R) : To every action there is an equal but opposite reaction.

45. *Assertion (A) :* The dimensions of moment of force are the same as those of work.
Reason (R) : Moment of force is $r \times F$ while works is $r.F$.

46. *Assertion (A) :* Out of four Indian satellites, Rohini, Aryabhatt, Bhasker and Insat-1B, the time period of Insat-1B is maximum.
Reason (R) : Insat-1B is a communication satellite while others are orbital satellites.

47. *Assertion (A) :* A body is floating completely submerged in a liquid. When it is further pushed inside the liquid it remains in a position in which it is left.
Reason (R) : When a body floats in a liquid completely submerged, there is no net force acting on it.

48. *Assertion (A) :* The fundamental frequency of an open organ pipe increases as the temperature is increased.
Reason (R) : This is because as the temperature increases, the velocity of sound increases more rapidly than length of the pipe.

49. *Assertion (A) :* Alpha particles produce more intense ionisation than beta particles.
Reason (R) : Alpha particles are positively charged.

50. *Assertion (A)* : The lightening conductor at the top of high buildings has sharp pointed ends.
Reason (R) : The surface density of charge at sharp points is very high resulting in setting up of electric wind

51. *Assertion (A)* : In a radioactive disintegration an electron is emitted by the nucleus.
Reason (R) : Electrons are always present inside the nucleus.

52. *Assertion (A)* : In Rutherford's experiment, α - particles from a radium source were allowed to fall on a 10^{-4} mm thick gold foil. Most of α- particles passed straight through the foil.
Reason (R) : The entire positive charge and nearly whole of the mass of the nucleus is concentrated in the nucleus.

53. *Assertion (A)* : The relative velocity of two photons travelling in opposite directions is C.
Reason (R) : The rest mass of a photon is zero.

54. *Assertion (A)* : Tiny drops of liquid resist deforming forces better than bigger drops.
Reason (R) : Excess pressure inside a drop is directly proportional to the surface tension.

55. *Assertion (A)* : The couple acting on a body is not equal to the rotational K.E. of the body.
Reason (R) : Couple and K.E. have different units.

56. *Assertion (A)* : A thin aluminium disc spinning freely about a central pivot is quickly brought to rest when placed between the poles of a strong U-shaped magnet.
Reason (R) : A current induced in a disc rotating in a magnetic field produces a force which tends to oppose the disc's motion.

57. *Assertion (A)* : The period of simple pendulum is independent of the mass of the bob.
Reason (R) : Inertial and gravitational masses are equivalent.

58. *Assertion (A)* : The frequencies of incident, reflected and refracted beam of monochromatic light incident from one medium to another are the same.
Reason (R) : The incident, the reflected and the refracted rays are coplanar.

59. *Assertion (A)* : Radio waves can be polarised.
Reason (R) : Sound waves in air are longitudinal in nature.

60. *Assertion (A)* : A hollow metallic closed container maintained at a uniform temperature can act as a black body for radiations.
Reason (R) : All metals acts as black bodies.

CHEMISTRY

61. An e^- has magnetic quantum number as -3, what is its principal quantum number?
(a) 3
(b) 2
(c) 1
(d) 4.

62. Wavelength associated with electron motion
(a) decreases with increase in speed of e^-
(b) remains same irrespective of speed of electron
(c) increases with increase in speed of electron
(d) is zero.

63. A reaction is $A + B \to C + D$. Initially, we start with equal concentration of A and B. At equilibrium we find the moles of C is two times of A. What is the equilibrium constant of the reaction ?
(a) 1/4
(b) 2
(c) 4
(d) 1/2.

64. A catalyst in a chemical reaction -
(a) changes the equilibrium constant of a reaction
(b) increases the activation energy of the reaction
(c) does not initiate a reaction
(d) does not change the rate of the reaction.

65. Aromatic compounds undergo-
(a) electrophilic substitution
(b) electrophilic addition
(c) nucleophilic addition reaction
(d) none of these.

66. CH_3COOH is reacted with $CH \equiv CH$ in presence of Hg^{++}, the product is -
(a) $\begin{array}{c} CH_2(OOCCH_3) \\ | \\ CH_2(OOCCH_3) \end{array}$

$$CH_3$$
(b) $C — (OOC — CH_3)$

$$CH_3$$
(c) $HC — (OOC — CH_3)_2$

(d) none of these.

67. Which of the following is an electrophile?
   (a) $AlCl_3$ (b) NH_3
   (C) H_2O (D) $C_2H_5NH_2$.

68. DDT is prepared by reacting chlorobenzene with
   (a) $CHCl_3$ (b) $CCl_3 — CHO$
   (c) CCl_4 (d) ethane.

69. Which of the following has highest chlorine content?
   (a) chloral   (b) DDT
   (c) pyrene   (d) gammexane.

70. Which one of the following is the chiral molecule?
   (a) $CHBr_3$ (b) CH_2Cl_2
   (c) CH_3Cl (d) CHClBrI.

71. H_2S is passed through an acidified solution of Ag, Cu and Zn. Which forms precipitates ?
   (a) Cu   (b) Zn
   (c) Ag   (d) none of these.

72. Which of the following compounds volatilises on heating ?
   (a) $ZnCl_2$ (b) $HgCl_2$
   (c) $MgCl_2$ (d) none of these.

73. Which of the following oxides reacts with HCl and NaOH ?
   (a) N_2O_5 (b) ZnO
   (c) CaO   (d) CO_2.

74. When acetylene is passed through dil. H_2SO_4 in the presence of $HgSO_4$ the compound formed is
   (a) carbide of Hg   (b) acetone
   (c) C_2H_5OH (d) acetaldehyde.

75. Which metal is protected by a layer of its own oxide ?
   (a) Al_2O_3 (b) MgO
   (c) Na_2O (d) CaO.

76. The neutralisation of a strong acid by a strong base liberates an amount of energy per mole of H^+ that
   (a) depends upon which catalyst is used
   (b) depends upon the temperature at which the reaction takes place
   (c) depends upon which acid and base are involved
   (d) is always the same.

77. Albumin proteins are most abundant in
   (A) egg   (B) milk
   (C) meat   (D) soyabean.

78. One of the following is false for Hg
   (a) it has high specific heat
   (b) it is a metal
   (c) it can evolve hydrogen from H_2S
   (d) it is less reactive than hydrogen.

79. Equal volumes of methanoic acid and sodium hydroxide are mixed, if x is the heat of formation of water, then heat evolved on neutralisation is
   (a) twice of x (b) equal to x
   (c) more than x (d) less than x.

80. Which is not a macromolecule?
   (a) palmitate   (b) starch
   (c) DNA   (d) insulin.

81. Increase in boiling point of a sucrose solution is 0.1 K, then what is increase in boiling point of the same concentration of NaCl solution ?
   (a) 0.4 K   (b) 0.2 K
   (c) 0.1 K   (d) 0.58 K.

82. Specific heat of metal is 0.23 and its chloride contains 87% of chlorine. What is the exact atomic weight of the metal ?
   (a) 62   (b) 54
   (c) 24   (d) 26.2.

83. 240 g of urea is present in 10 litre solution, the active mass of urea will be
   (a) 0.4 mol/lit   (b) 0.06 mol/lit
   (c) 0.2 mol/lit   (d) 0.08 mol/lit.

84. Which of the following is most acidic?
    (a) Al_2O_3 (b) MgO
    (c) Na_2O (d) CaO.

85. The gas molecules have r.m.s. velocity of its molecules as 1000 m/s. What is its average velocity?
    (a) 546 m/s   (b) 921.58 m/s
    (c) 1012 m/s   (d) 960 m/s.

86. The IUPAC name of $C_2H_5CONH_2$ is
    (a) propanamide   (b) benzamide
    (c) methanamide   (d) ethanamide

87. The catalyst $SnCl_2/HCl$ is used in
    (a) Clemmensen reduction reaction
    (b) Cannizzaro's reduction reaction
    (c) Stephen's reduction reaction
    (d) Rosen mund's reduction reaction

88. Which of the following is correct?
    (a) german silver-Cu + Zn + C
    (b) duralumin-Al + Cu + Mg + Ag
    (c) gun metal-Cu + Zn + Sn
    (d) solder-Pb + Al

89. The Grignard reagent, on reaction with acetone forms
    (a) acetic acid
    (b) secondary alcohol
    (c) tertiary alcohol
    (d) acetaldehyde

90. The order of stability of carbonium ion is
    (a) $3° > 1° > 2° > CH_3^+$
    (b) $3° > 2° > 1° > CH_3^+$
    (c) $CH_3^+ > 1° > 2° > 3°$
    (d) $2° > 3° > 1° > CH_3^+$

91. The bond angle of sp^2-hybrid orbital is
    (a) 105°   (b) 180°
    (c) 120°   (d) 109°

92. The positron has mass equal to
    (a) deutron   (b) proton
    (c) electron   (d) α-particle

93. The square planar shape is for
    (a) $[CrF_6]^{3-}$ (b) $[Cu(NH_3)_4]^{2+}$
    (c) BF_4 (d) none of these

94. In which of the following reactions, the hydrogen peroxide is a reducing agent?
    (a) $2HI + H_2O_2 \rightarrow 2H_2O + I_2$
    (b) $Cl_2 + H_2O_2 \rightarrow 2HCl + O_2$
    (c) $2FeCl_2 + 2HCl + H_2O_2 \rightarrow 2FeCl_3 + 2H_2O$
    (d) $H_2SO_3 + H_2O_2 \rightarrow H_2SO_4 + H_2O$

95. If $[Zn^{2+}] = 0.1$ M and $E^0 = -0.76$ V then half cell potential at 298 K for the reaction
    $Zn^{2+}(aq) + 2e^- \rightarrow Zn(s)$ is
    (a) -0.698 V   (b) -0.789 V
    (c) 0.789 V   (d) 0.698 V

96. The osmotic pressure of a 5% solution of cane sugar at 15°C is (Mol.wt. of cane sugar = 342)
    (a) 3.57 atm   (b) 3.45 atm
    (c) 2.35 atm   (d) 4 atm

97. The pH value of a solution whose hydronium ion concentration 6.2×10^{-9} mol L^{-1} is
    (a) 7.75   (b) 7.21
    (c) 6.21   (d) 8.21

98. Which of the following metal acts as the most efficient catalyst?
    (a) alkaline earth metal
    (b) transition metal
    (c) alkali metal
    (d) coloured metals

99. Silver chloride is soluble in methylamine due to the formation of
    (a) $[Ag(CH_3NH_2)_2]Cl$ (b) $Ag(CH_3NH_2)Cl$
    (c) AgOH
    (d) $Ag + CH_3Cl + NH_4Cl$

100. Which of the following represents noble gas configuration?
    (a) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 4d^{10} 5s^2 5d^1 6s^2$
    (b) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4f^{14} 5s^2 5p^6 5p^1$
    (c) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 4d^{10} 5s^2 5p^6$
    (d) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 4d^{10} 5s^2 5p^6 5d^5 6s^2$

Instructions for Q. No. 101 to 120

Directions : Each of the questions given below consists of two statements, an assertions (A) and reason (R). Select the number corresponding to the appropriate response in the answer sheet as follows.

(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 the reason is not a correct explanation of the assertion*

(c) *If the assertion is true, but the reason is false*

(d) *If both assertion and reason are falses*

101. *Assertion (A) :* The name butanol is not specific, whereas the name butanone represents one specific compound.
Reason (R) : Alcohols show phenomenon of isomerism where as ketones do not show isomerism

102. *Assertion (A) :* Alkenes and cycloalkanes series of hydrocarbons have same general formula.
Reason (R) : Either insertion of a double bond or formation of a ring reduce the number of hydrogen atoms of corresponding alkane by 2.

103. *Assertion (A) :* The carbon atoms of the benzene ring may be numbered for identification of substituent groups, just as a continuous chains of carbon atoms are numbered.
Reason (R) : Smallest set of numbers designating the substituents is the preferred set.

104. *Assertion (A) :* White precipitate of lead chloride $(PbCl_2)$ is soluble in concentrated solution of potassium chloride.
Reason (R) : Tetrachloroplumbate (II) ion is formed when chloride ions attacks the Lead (II) chloride.

105. *Assertion (A) :* Mercurous chloride (Hg_2Cl_2) precipitate, on reacting with ammonia solution, gives a mixture of mercury (II) amidochloride and mercury metal.
Reason (R) : The reaction of ammonia and Hg_2Cl_2 involves disproportionation in which simultaneous oxidation and reduction take place.

106. *Assertion (A) :* In a given electrical field beta particles (β) are deflected more than alpha particles (α).
Reason (R) : Beta particles have very low e/m value as compared to alpha particles.

107. *Assertion (A) :* Neutrons are better projectiles for nuclear reactions than protons or α-particles
Reason (R) : Neutrons are neutral particles and hence, their penetration in nucleus is rather difficult.

108. *Assertion (A) :* The solubility of n-alcohols in water decreases with increase in molecular weight.
Reason (R) : The relative proportion of the hydrocarbon part in alcohols increases with the increase in molecular weight which permits enhanced hydrogenbonding with water.

109. *Assertion (A) :* The nitro group, if present in ortho or para positions, would stabilise the phenoxide ion by dispersal of negative charge through mesomeric effect.
Reason (R) : The electron releasing substituents would intensify the negative charge. As a result electron releasing group in phenol should be acid-weakening.

110. *Assertion (A) :* The electronic arrangement with exactly half-filled or completely filled degenerate orbitals would be more stable that any other electronic arrangement.
Reason (R) : The electronic configuration with even or uniform or symmetrical distribution of charge in all directions would evidently be associated with high energy.

111. *Assertion (A) :* The lactic acid shows the geometrical isomerism.
Reason (R) : Lactic acid has carbon-carbon double bond.

112. *Assertion (A) :* 2-hydroxy 1, 4-butane dioic acid is known as malic acid.
Reason (R) : It is present in unripe apples.

113. *Assertion (A) :* During the fermentation of grape juice, a reddish brown coloured crust is formed.
Reason (R) : Impure potassium hydrogen tartrate is of reddish brown colour and it is known as argol.

114. *Assertion (A) :* Amines are more basic than ethers and esters.
Reason (R) : Nitrogen is less electronegative than oxygen, it is in better position to accomodate the positive charge of the proton.

115. *Assertion (A) :* An orbital cannot have more than two electrons, moreover, if an orbital has two electrons they must have opposite spins.
Reason (R) : No two electrons in an atom can have same set of all the four quantum numbers.

116. *Assertion (A) :* The pairing of electrons in the orbitals of a particular sub-shell are singly occupied.
Reason (R) : Singly occupied orbitals must have the electrons with parallel spins.

117. *Assertion (A) :* Fluorine molecule has bond order one.
Reason (R) : The number of electrons in antibonding molecular orbitals is two less than that in bonding molecular orbitals.

118. *Assertion (A) :* Nitrate ion (NO_3^-) is a Bronsted base.
Reason (R) : Bronsted base is a chemical species which can accept H^+ ions.

119. *Assertion (A) :* The molality of the solution does not change with change in temperature.
Reason (R) : The molality is expressed in units of moles per 1000 gm of solvent.

120. *Assertion (A) :* The molecularity of the reaction $H_2 + Br_2 \rightarrow 2HBr$ is two.
Reason (R) : The order of this reaction is 3/2.

BIOLOGY

121. The eukaryotic genome differs from the prokaryotic genome because
   (a) the DNA is complexed with histones in prokaryotes
   (b) repetitive sequences are present in eukaryotes
   (c) the DNA is circular and single stranded in prokaryotes
   (d) genes in the former case are organized into operons.

122. In DNA, when AGCT occurs, their association is as per which of the following pair?
   (a) AT-GC   (b) AG-CT
   (c) AC-GT   (d) all of these.

123. Edible part in litchi is
   (a) endosperm   (b) mesocarp
   (c) pericarp   (d) fleshy aril.

124. Which of the following is the main category of mutation?
   (a) somatic mutation
   (b) genetic mutation
   (c) zygotic mutation
   (d) all of these.

125. In soil, water available for plants is
   (a) gravitational water
   (b) capillary water
   (c) chemically bound water
   (d) hygroscopic water.

126. Green house effect refers to
   (a) production of cereals
   (b) cooling of earth
   (c) warming of earth
   (d) trapping of UV rays.

127. Energy transfer from one trophic level to other in a food chain is
   (a) 10%   (b) 1%
   (c) 20%   (d) 2%.

128. Carbon dioxide acceptor in C_3-plants is
   (a) PGA   (b) PEP
   (c) RuDP   (d) none of these.

129. In 1984, Bhopal gas tragedy was caused due to leakage of
   (a) potassium isocyanate
   (b) sodium monoxide
   (c) methyl isocyanate
   (d) sodium thiocyanate.

130. Land mass occupied by forest is about
   (a) 30%   (b) 11%
   (c) 60%   (d) 22%.

131. Which of the following is a secondary pollutant?
 (a) PAN   (b) CO
 (c) aerosol   (d) CO_2.

132. Which of the following is related to genetic engineering?
 (a) heterosis   (b) plastid
 (c) mutation   (d) plasmid.

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

134. The maximum biomagnification would be in which of the following in case of aquatic ecosystem?
 (a) zooplankton   (b) fishes
 (c) phytoplankton   (d) birds.

135. The book 'Genera plantarum' was written by
 (a) Engler & Prantl   (b) Bessey
 (c) Bentham & Hooker (d) Hutchinson.

136. Columella is a specialized structure found in the sporangium of
 (a) Spirogyra   (b) Ulothrix
 (c) Rhizopus   (d) none of these.

137. A system of classification in which a large number of traits are considered is
 (a) natural system   (b) artificial system
 (c) phylogenetic system
 (d) synthetic system.

138. Which of the following is true about bryophytes?
 (a) they are thalloid
 (b) they posses archegonia
 (c) they contain chloroplast
 (d) all of these.

139. The endosperm of gymnosperm is
 (a) diploid   (b) triploid
 (c) polyploid   (d) haploid.

140. In which of the following would you place the plants having vascular tissue lacking seeds?
 (a) pteridophytes   (b) algae
 (c) gymnosperms   (d) bryophytes.

141. In prokaryotes, the genetic material is
 (a) linear DNA without histones
 (b) linear DNA, with histones
 (c) circular DNA without histones
 (d) circular DNA with histones.

142. Bryophytes have
 (a) dominant phase of gametophyte which produces spores
 (b) sporophyte is of longer duration
 (c) small sporophyte phase and generally parasitic on gametophyte
 (d) dominant phase of sporophyte which is parasitic.

143. The antherozoids of Funaria are
 (a) multiciliated   (b) aciliated
 (c) monociliated   (d) biciliated.

144. DNA is mainly found in
 (a) nucleolus   (b) nucleus only
 (c) cytoplasm only   (d) none of these.

145. Which of the following organ has single membrane?
 (a) mitochondria   (b) nucleus
 (c) spherosomes   (d) cell wall.

146. An oxidative phosphorylation is the formation of
 (a) ATP in respiration
 (b) $NADPH_2$ in respiration
 (c) ATP in photosynthesis
 (d) $NADPH_2$ in photosynthesis.

147. Lactose is a
 (a) polysaccharide   (b) disaccharide
 (c) monosaccharide   (d) none of these.

148. The end products of respiration in plants are
 (a) sugar and O_2
 (b) H_2O and energy
 (c) CO_2, H_2O & energy
 (d) starch and O_2.

149. The correct sequence in cell cycle is
 (a) G_1-S-G_2-M   (b) S-G_1-G_2-M
 (c) M-G_1-G_2-S   (d) S-M-G_1-G_2.

150. The high energy bonds at ATP are between
    (a) C-N
    (b) C-C
    (c) P-P
    (d) C-O.

151. The proper scientific name of cellobiose is
    (a) 4N H_2SO_4-β-D-reductase
    (b) 4-O-β-glucopyranosyl-D-glucose
    (c) 6 NH_3PO_4-α-D-reductase
    (d) 8-O-β-D-glucopyranosyl-D-glucose.

152. Feulgen reaction was developed by Feulgen and Rossenbeck to study
    (a) protein
    (b) DNA
    (c) lipid
    (d) RNA.

153. Chromonemata start associating into bivalent chromosomes during
    (a) pachytene
    (b) zygotene
    (c) diplotene
    (d) leptotene.

154. In meiosis, the centromere divides during
    (a) anaphase-I
    (b) prophase I
    (c) anaphase II
    (d) metaphase I.

155. During interphase, RNA and proteins are synthesized in
    (a) G_2 phase
    (b) S phase
    (c) in both G_1 and G_2 phases
    (d) G_1 phase.

156. Kreb's cycle takes place in
    (a) chloroplast
    (b) mitochondria
    (c) golgi bodies
    (d) ribosome.

157. Who got the Nobel Prize on working of enzymes in the year 1978?
    (a) R. Misra
    (b) W. Arber and D. Nathans
    (c) G.G. Khorana
    (d) Nass and Nass.

158. Plants life originated earlier than animal life because
    (a) they can synthesize their food
    (b) plants have simple structure
    (c) plants are more in number
    (d) none of the above.

159. During denaturation of proteins, which of the following bond is broken?
    (a) peptide bonds
    (b) H-bonds
    (c) hydrophobic bonds
    (d) electrostatic bonds.

160. End product of respiration is
    (a) citric acid
    (b) malic acid
    (c) pyruvic acid
    (d) none of these.

Instructions for Q. No. 161 to 180
Directions : Each of the questions given below consists of two statements, an assertions (A) and reason (R). Select the number corresponding to the appropriate response in the answer sheet as follows.
    (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 the reason is not a correct explanation of the assertion
    (c) If the assertion is true, but the reason is false
    (d) If both assertion and reason are falses

161. *Assertion (A) :* Photosynthesis is an anabolic process.
    Reason (R) : Carbohydrate are used up during this process.

162. *Assertion (A) :* C_4 plants are capable of photosynthesizing under very low CO_2 concentration.
    Reason (R) : RuBP carboxylase is present in them.

163. *Assertion (A) :* Vitamin deficiency are not seen in plants.
    Reason (R) : Vitamins are essential for growth.

164. *Assertion (A) :* Fungi may be heterotrophic or autotrophic.
    Reason (R) : Stored food material in fungi is starch.

165. *Assertion (A) :* Peptidoglycan is found in the cell wall of algae.
    Reason (R) : Blue green algae are a group of eukaryotes.

16. *Assertion (A) :* Homozygous dominant individual can be used in a test cross to determine the genotype

of an individual showing the recessive phenotype.
Reason (R) : Test cross is a type of back cross.

167. *Assertion (A)* : Fatty liver syndrome is caused due to tobacco addiction.
Reason (R) : Cirrhosis is a disease of kidney.

168. *Assertion (A)* : Aortic semilunar valves become very weak in rheumatic heart disease.
Reason (R) : Rheumatic heart disease includes angina pectoris and coronary thrombosis.

169. *Assertion (A)* : Increase in substrate concentration increases the rate of reaction.
Reason (R) : This is due to occupation of more active sites by substrate molecules.

170. *Assertion (A)* : Stability of a biotic community is governed mainly by its diversity.
Reason (R) : Stability of biotic community is the absence of fluctuations in the population.

171. *Assertion (A)* : If the tadpoles are kept in water containing the element iodine or a weak solution of iodine it undergoes rapid metamorphosis.
Reason (R) : The process of metamorphosis is controlled and regulated by thyroxine hormone, which affects the growth and differentiation of cells.

172. *Assertion (A)* : Fibrinolysis dissolution of fibrin by fibrinolysin caused by the action of proteolytic enzyme system.
Reason (R) : Proteolytic enzyme system is continuously active in the body, but its action is greatly increased by various stress stimuli.

173. *Assertion (A)* : Hydrostatic pressure in blood forces water and low molecular mass solutes of the glomeruli into the Bowman's capsule.
Reason (R) : Kidneys play a major role in regulating the blood pH.

174. *Assertion (A)* : Oynchophora is a small group of animals with molluscan and arthropod affinities.
Reason (R) : It represents an early stage of evolution of annelids.

175. *Assertion (A)* : Emboly involves the invagination and involution through blotting process by the mesentoblast cells.
Reason (R) : Emboly is exhibited by the formation, elongation and ultimate recession of the primitive streak.

176. *Assertion (A)* : The division of extracellular protoplast is called cytokinesis.
Reason (R) : This division is accomplished either through the formation of cell plate in between the newly formed daughter cell or by means of peripheral furrowing.

177. *Assertion (A)* : Plasma membrane is exceedingly thin and not visible as a separate layer.
Reason (R) : It appears merely as a surface layer of cytoplasm.

178. *Assertion (A)* : Ribosomes are not self-replicating particles.
Reason (R) : Lysosomes are membrane bounded vesicles that contain hydrolytic enzymes.

179. *Assertion (A)* : Increase in the quantity of metabolically active protoplasm, accompanied by an increase in cell number and cell size or both called growth.
Reason (R) : Growth, in plants, is not restricted to any specific regions.

180. *Assertion (A)* : The preparation of r-DNA does not require restriction enzymes.
Reason (R) : Because they are not responsible for cleaving plasmid DNA.

GENERAL KNOWLEDGE

181. International Day Against Drug Abuse and Illicit Trafficking is observed on
    (a) June 25   (b) July 26
    (c) June 26   (d) Aug 26

182. The author of book "What went wrong" is
    (a) Atal Bihari Vajpai   (b) Kiran Bedi
    (c) Sonia Gandhi   (d) Seen Smith

183. Which of the following cricket teams set a new record of 12 successive test wins in December 2000.
    (a) South Africa   (b) Australia
    (c) Pakistan   (d) India

184. Name of the leader who was regarded by Mahatma Gandhi as his political guru
    (a) Gopal Krishan Gokhale
    (b) Lord Irwin   (c) Leo Jolstoy
    (d) Rabindra Nath Tagore

185. Which metal is also known as quick silver
    (a) silver   (b) mercury
    (c) tin   (d) zinc

186. Year 2001 is devoted to
    (a) physical health   (b) mental health
    (c) environment   (d) none of these

187. Who among the following made a history by becoming the first batsman to complete 10000 runs in one day cricket
    (a) Sunil Gawaskar   (b) Allen Border
    (c) Sachin Tendulkar   (d) Saurav Ganguly

188. Whom does the president of India send his resignation if he wants to quit his office
    (a) Chief Justice of India
    (b) Prime Minister
    (c) Vice President of India
    (d) Any of these

189. Bombay high is well known in India for
    (a) oil exploration   (b) hanging garden
    (c) fishing in deep sea
    (d) atomic reactor.

190. Which of the following is the oldest dynasty of India
    (a) Vardhan   (b) Kushan
    (c) Maurya   (d) Gupta

191. The line demarcating the boundary between India and China is called
    (a) Radcliffe line   (b) 68th parallel
    (c) McMohan line   (d) Durand line

192. The Jnanpith award for the year 2000-2001 is awarded to
    (a) Ms Indira Goswami
    (b) Arundhati Roy
    (c) Birendra Kumar Bhattacharya
    (d) both (a) and (c)

193. Which of the following in news who refused to accept the Arjun award for life time contribution?
    (a) Venkatesh Prasad   (b) Baljeet Singh Saini
    (c) Milkha Singh   (d) S. Vijayalakshmi

194. The National Bureau of Plant Genetics Resources (NBPGR) is in
    (a) Lucknow   (b) Hyderabad
    (c) Mumbai   (d) New Delhi

195. Who among the following is a famous flute singer
    (a) Ravi Shankar   (b) Shiv Kumar Sharma
    (c) Jakir Hussain
    (d) Hariprasad Chaurasia

196. At the equator, the duration of a day is
    (a) 10 hrs   (b) 12 hrs
    (c) 14 hrs   (d) 16 hrs

197. RDX is
    (a) an instrument to measure blood pressure
    (b) a gene
    (c) a chemical used in the manufacture of fertilizers
    (d) an explosive

198. When the sun reaches its maximum distance from equator, it is known as
    (a) solstice   (b) eclipse
    (c) equinox   (d) sidereal day

199. Heavy alcohol consuming people generally die of
    (a) blood cancer   (b) cirrhosis
    (c) liver or stomach cancer
    (d) rigor mortis

200. Which country is to host the first Afro Asian Games in 2001.
    (a) Japan   (b) India
    (c) Egypt   (d) South Africa

■ ■ ■