SOLVED PAPER
AIIMS - 2007

Time : 3½ Hours

Max. Marks : 200

PHYSICS

1. The camera lens has an aperture of f and the exposure time is (1/60) s. What will be the new exposure time if the aperture become $1.4f$?
   (a) $\frac{1}{42}$ (b) $\frac{1}{56}$
   (c) $\frac{1}{72}$ (d) $\frac{1}{31}$

2. A point source is kept at a distance of 1000 m has an illumination I. To change the illumination to $16I$ the new distance should become
   (a) 250 m (b) 500 m
   (c) 750 m (d) 800 m

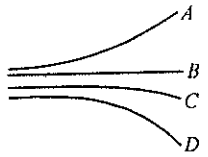
3. If collector current is 120 mA and base current is 2 mA and resistance gain is 3, what is power gain?
   (a) 180 (b) 10800
   (c) 1.8 (d) 18

4. With the decrease of current in the primary coil from 2 amperes to zero value in 0.01s the emf generated in the secondary coil is 1000 volts. The mutual inductance of the two coils is
   (a) 1.25 H (b) 2.50 H
   (c) 5.00 H (d) 10.00 H

5. In case of infinite long wire electric field is proportional to
   (a) $\frac{1}{r}$ (b) $\frac{1}{r^2}$
   (c) $\frac{1}{r^3}$ (d) r^0

6. What is the magnetic field at a distance R from a coil of radius r carrying current I?
   (a) $\frac{\mu_0 IR^2}{2(R^2+r^2)^{\frac{3}{2}}}$ (b) $\frac{\mu_0 Ir^2}{2(R^2+r^2)^{\frac{3}{2}}}$
   (c) $\frac{\mu_0 I}{2r}$ (d) $\frac{\mu_0 I}{2R}$

7. In the following diagram, which particle has highest e/m value?



   (a) A (b) B
   (c) C (d) D

8. What is the energy of He^+ electron in first orbit?
   (a) 40.8 eV (b) –27.2 eV
   (c) –54.4 eV (d) –13.6 eV

9. What is the dimensions of impedance ?
   (a) $ML^2T^{-3}I^{-2}$ (b) $M^{-1}L^{-2}T^3I^2$
   (c) $ML^3T^{-3}I^{-2}$ (d) $M^{-1}L^{-3}T^3I^2$

10. If the highest modulating frequency of the wave is 5 kHz, the number of stations that can be accomodated in a 150 kHz bandwidth ?
    (a) 15 (b) 10
    (c) 5 (d) None of these

11. Zener diode acts as a/an
    (a) oscillator (b) regulator
    (c) rectifier (d) filter

12. In communication with help of antenna if height is doubled then the range covered which was initially r would become
    (a) $\sqrt{2}r$ (b) $3r$
    (c) $4r$ (d) $5r$

13. Which wavelength of sun is used finally as electric energy?
    (a) Radio waves (b) Infra red waves
    (c) Visible light (d) Micro waves

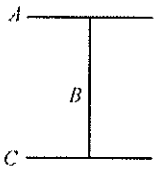
14. CO_2 laser uses
    (a) microwaves (b) infra red
    (c) ultra violet (d) visible light

15. Shear modulus is zero for
(a) solids (b) liquids
(c) gases (d) liquids and gases

16. Height of geostationary satellite is
(a) 16000 km (b) 22000 km
(c) 28000 km (d) 36000 km

17. If a solid sphere of mass 1 kg and radius 0.1 m rolls without slipping at a uniform velocity of 1 m/s along a straight line on a horizontal floor, the kinetic energy is
(a) $\frac{7}{5}$ J (b) $\frac{2}{5}$ J
(c) $\frac{7}{10}$ J (d) 1 J

18. In the diagram shown below all three rods are of equal length L and equal mass M. The system is rotated such that rod B is the axis. What is the moment of inertia of the system?



(a) $\frac{ML^2}{6}$ (b) $\frac{4}{3}ML^2$
(c) $\frac{ML^2}{3}$ (d) $\frac{2}{3}ML^2$

19. In the half wave rectifier circuit operating from 50 Hz mains frequency, the fundamental frequency in the ripple would be
(a) 25 Hz (b) 50 Hz
(c) 70.7 Hz (d) 100 Hz

20. In an AC circuit the potential differences across an inductance and resistance joined in series are respectively 16 V and 20 V. The total potential difference of the source is
(a) 20.0 V (b) 25.6 V
(c) 31.9 V (d) 53.5 V

21. The focal length of the objective and eye lenses of a microscope are 1.6 cm and 2.5 cm respectively. The distance between the two lenses is 21.7 cm. If the final image is formed at infinity. What is the linear magnification?
(a) 11 (b) 110
(c) 1.1 (d) 44

22. If the temperature of a black body increases from 7°C to 287°C then the rate of energy radiation increases by
(a) $\left(\frac{287}{7}\right)^4$ (b) 16
(c) 4 (d) 2

23. Faraday law of electrolysis indirectly shows
(a) quantisation of charge
(b) quantisation of angular momentum
(c) quantisation of current
(d) quantisation of viscosity

24. What is the amount of energy released by deuterium and tritum fusion?
(a) 60.6 eV (b) 12.6 eV
(c) 17.6 eV (d) 28.3 eV

25. What is the energy of photon whose wavelength is 6840 Å ?
(a) 1.81 eV (b) 3.6 eV
(c) −13.6 eV (d) 12.1 eV

26. Calculate power output of $^{235}_{92}U$ reactor, if it takes 30 days to use up 2 kg of fuel, and if each fission gives 185 MeV of useable energy. Avogadro's number = 6×10^{23}/mol?
(a) 56.3 MW (b) 60.3 MW
(c) 58.3 MW (d) 54.3 MW

27. A transistor is a/an
(a) chip (b) insulator
(c) semiconductor (d) metal

28. The number 0 (zero) is required for
(a) transistor (b) abacus
(c) computer (d) calculator

29. The magnetic susceptibility of an ideal diamagnetic substance is
(a) −1 (b) 0
(c) + 1 (d) ∞

30. The direction of the angular velocity vector is along
(a) the tangent to the circular path
(b) the inward radius
(c) the outward radius (d) the axis of rotation

31. A man of mass 60 kg records his wt. on a weighing machine placed inside a lift. The ratio of wts. of man recorded when lift is ascending up with a

uniform speed of 2 m/s to when it is descending down with a uniform speed of 4 m/s will be
(a) 0.5 (b) 1
(c) 2 (d) none of these

32. The force of gravitation is
(a) repulsive (b) conservative
(c) electrostatic
(d) non-conservative

33. In old age arteries carrying blood in the human body become narrow resulting in an increase in the blood pressure. This follows from
(a) Pascal's law
(b) Stoke's law
(c) Bernoulli's principle
(d) Archimede's principle

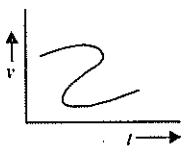
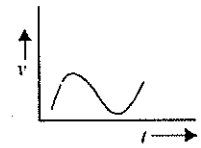
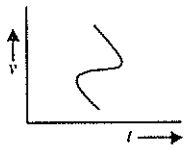
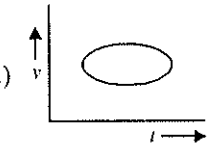
34. In an adiabatic change, the pressure and temperature of a monoatomic gas are related as $P \propto T^C$, where C equals
(a) $\frac{2}{5}$ (b) $\frac{5}{2}$
(c) $\frac{3}{5}$ (d) $\frac{5}{3}$

35. A large horizontal surface moves up and down in S.H.M. with an amplitude of 1 cm. If a mass of 10 kg (which is placed on the surface) is to remain continuously in contact with it, the maximum frequency of S.H.M. will be
(a) 5 Hz (b) 0.5 Hz
(c) 1.5 Hz (d) 10 Hz

36. A siren emitting sound of frequency 800 Hz is going away from a static listener with a speed of 30 m/s. The frequency of sound heard by listener is (velocity of sound = 300 m/s)
(a) 727.3 Hz (b) 481.2 Hz
(c) 644.8 Hz (d) 286.5 Hz

37. Which of the following physical quantities do not have same dimensions?
(a) pressure and stress
(b) tension and surface tension
(c) strain and angle
(d) energy and work.

38. Which of the following velocity-time graphs shows a realistic situation for a body in motion?

(a) 
(b) 
(c) 
(d) 

39. Work of 3.0×10^{-4} joule is required to be done in increasing the size of a soap film from 10 cm × 6 cm to 10 cm × 11 cm. The surface tension of the film is
(a) 5×10^{-2} N/m (b) 3×10^{-2} N/m
(c) 1.5×10^{-2} N/m (d) 1.2×10^{-2} N/m

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

Directions : In the following questions (41-60), a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as :
[a] If both assertion and reason are true and reason is the correct explanation of assertion
[b] If both assertion and reason are true but reason is not the correct explanation of assertion
[c] If assertion is true but reason is false
[d] If both assertion and reason are false.

41. **Assertion** : Goggles have zero power.
Reason : Radius of curvature of both sides of lens is same

42. **Assertion** : A white source of light during interference forms only white and black fringes.
Reason : Width of fringe is inversely proportional to the wavelength of the light used.

43. **Assertion** : A current continues to follow in superconducting coil even after switch is off.
Reason : Superconducting coils show Meissner effect.

44. **Assertion** : Heavy water is a better moderator than normal water.
Reason : Heavy water absorbs neutrons more efficiently than normal water.

45. **Assertion** : Dipole oscillations produce electromagnetic waves.
Reason : Accelerated charge produces electromagnetic waves.

46. **Assertion** : NAND is a universal gate.
Reason : It can be used to describe all other logic gates.

47. **Assertion** : Ferro magnetic substances become paramagnetic above Curie temp.
Reason : Domains are destroyed at high temp.

48. **Assertion** : In a cavity within a conductor, the electric field is zero.
Reason : Charges in a conductor reside only at its surface.

49. **Assertion** : Voltmeter is connected in parallel with the circuit
Reason : Resistance of a voltmeter is very large.

50. **Assertion** : Ohm's law is applicable for all conducting elements.
Reason : Ohm's law is a fundamental law.

51. **Assertion** : No power loss associated with pure capacitor in ac circuit.
Reason : No current is flowing in this circuit.

52. **Assertion** : In a metal all the free electrons have same energy.
Reason : Electrons do not obey Pauli's exclusion principle.

53. **Assertion** : Optical fibres are used for telecommunication
Reason : Optical fibres are based on the phenomenon of total internal reflection.

54. **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.

55. **Assertion** : Machine parts are jammed in winter.
Reason : The viscosity of lubricant used in machine parts increase at low temperatures.

56. **Assertion** : An astronaut experience weightlessness in a space satellite.
Reason : When a body falls freely it does not experience gravity.

57 **Assertion** : A brass tumbler feels much colder than a wooden tray on a chilly day.
Reason : The thermal conductivity of brass is more than the thermal conductivity of wood.

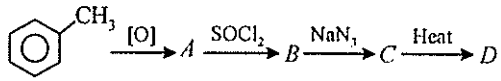
58. **Assertion** : In free expansion of an ideal gas, the entropy increases.
Reason : Entropy increases in all natural processes.

59. **Assertion** : ^{94}Sr from the radioactive fall out from a nuclear bomb ends up in the bones of human beings through the milk consumed by them. It causes impairment of the production of red blood cells.
Reason : The energetics β-particles emitted in the decay of ^{94}Sr damage the bone marrow.

60. **Assertion** : Sound waves cannot travel in vacuum but light can travel in vacuum.
Reason : Sound waves are longitudinal waves and they cannot be polarised but electromagnetic waves are transverse and they can be polarised.

CHEMISTRY

61. In the following sequence of the reactions, what is *D*?



(a) Primary amine (b) An amide
(c) Phenyl isocyanate
(d) A chain lengthed hydrocarbon

62. The coordination number in *hcp* is
(a) 6 (b) 12
(c) 18 (d) 24.

63. Cyanogen gas is obtained in the reaction
(a) $CuSO_{4(aq)} + KCN \longrightarrow$
(b) $K_4[Fe(CN)_6] \xrightarrow{heat}$
(c) $CH_3CN + H_2O \xrightarrow{\Delta}$
(d) $CH_3CONH_2 + P_2O_5 \xrightarrow{\Delta}$

64. The pH of the solution obtained on neutralisation of 40 mL 0.1 M NaOH with 40 ml 0.1 M CH_3COOH is
(a) 7 (b) 8
(c) 6 (d) 3.

65. Inert gases are mixed in iodine vapours. Then there are _____ between them.
(a) H-bonding
(b) van der Waals forces
(c) Electrostatic forces
(d) Metallic bonds.

66. Bond length order is
(a) $O_2 < O_3 < O_2^{2-}$ (b) $O_2 < O_2^{2-} < O_3$
(c) $O_2^{2-} < O_3 < O_2$ (d) $O_2 = O_2^{2-} > O_3$.

67. Largest difference in radii is found in case of the pair
(a) Li, Na (b) Na, K
(c) K, Rb (d) Rb, Cs.

68. 1 mol each of the following compounds is dissolved in 1L of solution. Which will have the largest ΔT_b value?
(a) HF (b) HCl
(c) HBr (d) HI.

69. $CH_3OC_2H_5$ and $(CH_3)_3C-OCH_3$ are treated with hydroiodic acid. The fragments after reactions obtained are
(a) $CH_3I + HOC_2H_5$; $(CH_3)_3C-I + HOCH_3$
(b) $CH_3OH + C_2H_5I$; $(CH_3)_3Cl + HOCH_3$
(c) $CH_3OH + C_2H_5$; $(CH_3)_3C-OH + CH_3I$
(d) $CH_3I + HOC_2H_5$; $CH_3I + (CH_3)_3-C-OH$.

70. Carbon and CO gas are used to reduce which of the following pairs of metal oxides for extraction of metals?
(a) FeO, SnO (b) SnO, ZnO
(c) BaO, Na_2O_2 (d) FeO, ZnO

71. Which of the following amines will not give N_2 gas on treatment with nitrous acid ($NaNO_2 + HCl$) ?
(a) $C_2H_5NH_2$ (b) CH_3NH_2
(c) $(CH_3)_2CH-NH_2$ (d) All will give N_2.

72. X-rays are emitted during
(a) α, n reaction (b) K-capture
(c) n, α reaction (d) β-emission.

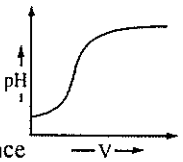
73. In P versus V graph, the horizontal line is found in which _____ exists.
(a) Gas (b) Liquid
(c) Equilibrium between gas and liquid
(d) Super critical temperature.

74. During estimation of nickel, we prepare nickel dimethylglyoxime, a scarlet red solid. This compound is _____.
(a) ionic (b) covalent
(c) metallic
(d) non-ionic complex.

75. Critical temperatures for A, B, C and D gases are 25°C, 10°C, –80°C and 15°C respectively. Which gas will be liquefied more easily ?
(a) A (b) B
(c) C (d) D.

76. Which of the following metal ions will form complexes with the same magnetic moment and geometry irrespective of the nature of ligands?
(a) Ni^{2+} (b) Fe^{2+}
(c) Cu^{2+} (d) Co^{2+}

77. During titration of acetic acid with aq. NaOH solution, the neutralisation graph has a vertical line. This line indicates



(a) alkaline nature of equivalence
(b) acidic nature of equivalence
(c) neutral nature of equivalence
(d) depends on experimental proceeding.

78. Which of the following radioisotopes is used as anticancerous?
(a) Na-24 (b) C-14
(c) U-235 (d) Co-60.

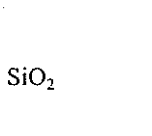
79. XeF_6 on complete hydrolysis produces
(a) $XeOF_4$ (b) XeO_2F_2
(c) XeO_3 (d) XeO_2.

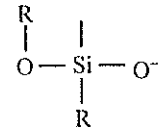
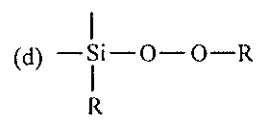
80. Calculate change in internal energy if $\Delta H = -92.2$ kJ, $P = 40$ atm and $\Delta V = -1$L.
(a) –42 kJ (b) –88 kJ
(c) +88 kJ (d) +42 kJ.

81. ΔH_{fusion} of a substance is 'x' and ΔH_{vap} is 'y', then $\Delta H_{sublimation}$ will be
(a) $x + y$ (b) $x - y$
(c) x/y (d) y/x.

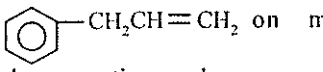
82. Decay constant of a radioactive substance is 69.3 sec^{-1}, find $t_{1/16}$ of the same substance.
(a) 4×10^{-2} sec (b) 2×10^{-2} sec
(c) 1×10^{-2} sec (d) none of these.

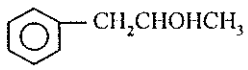
83. The repeating unit in silicone is

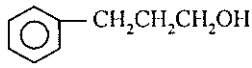
(a) SiO_2 (b) 

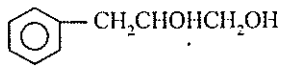
(c)  (d) 

84. Propene on hydroboration and oxidation produces
(a) $CH_3CH_2CH_2OH$ (b) $CH_3CHOHCH_3$
(c) $CH_3CHOHCH_2OH$ (d) CH_3CH_2CHO.

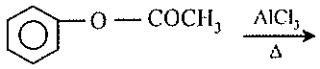
85.  on mercuration and demercuration produces

(a) 

(b) 

(c) 

(d) none of these.

86. 

The product obtained is/are
(a) *o*-product (b) *m*-product
(c) *o*- and *p*-products
(d) *o*-, *m*- and *p*-products.

87. The element which is the most abundant in the earth crust is
(a) O (b) S
(c) Al (d) H.

88. Wavelength of red light is absorbed by the complex
(a) $[Cu(CN)_4]^{2-}$ (b) $[Cu(NH_3)_4]^{2+}$
(c) $CuSO_4$ (d) $Cu(CN)_2$.

89. In the change $[Cu(H_2O)_6]^{2+} \xrightarrow{HCl} [CuCl(H_2O)_5]^{+}$, the colour changes from
(a) blue to green (b) blue to pink
(c) pink to green (d) pink to blue.

90. Benzoic acid is treated with lithium aluminium hydride. The compound obtained is
(a) benzaldehyde (b) benzyl alcohol
(c) toluene (d) benzene.

91. Chain transfer reagent is
(a) CCl_4 (b) CH_4
(c) O_2 (d) H_2.

92. Among the following components of cement which is present in highest amount?
(a) Ca_2SiO_4 (b) Ca_3SiO_5
(c) Al_2O_3 (d) $Ca_3Al_2O_6$.

93. A catalyst
(a) changes the equilibrium constant
(b) lowers the activation energy
(c) increases the forward and backward reactions at different speeds
(d) follows same mechanism for the reaction.

94. Which of the following does not contain any coordinate bond?
(a) H_3O^+ (b) BF_4^-
(c) HF_2^- (d) NH_4^+

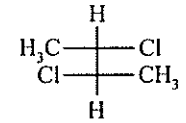
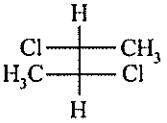
95. Which of the following species participate in sulphonation of benzene ring ?
(a) H_2SO_4 (b) SO_3
(c) HSO_3^- (d) SO_2^-

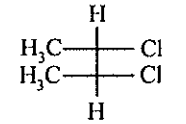
96. Which of the following statement is true ?
(a) Trimethyl amines form a soluble compound with Hinsberg reagent and KOH.
(b) Dimethylamines react with KOH and phenol to form an azo dye.
(c) Methylamine reacts with nitrous acid and liberates N_2 from aq. soln.
(d) None of these.

97. ΔS_{surr} for an exothermic reaction is
(a) always positive (b) always negative
(c) zero
(d) may be positive or negative.

98. The vapour pressure of pure benzene at a certain temperature is 0.850 bar. A non-volatile, non-electrolyte solid weighing 0.5g is added to 39.0 g of benzene (molar mass 78 g/mol). The vapour pressure of the solution then is 0.845 bar. What is the molecular mass of the solid substance?
(a) 58 (b) 180
(c) 170 (d) 145.

99. Which of the following is optically inactive?

(a)  (b) 

(c)  (d) none of these.

100. Which statement is true for ferrocene?
- (a) All Fe-C are of equal length
- (b) C are sp^3 hybridized
- (c) It was the first discovered organometallic compound
- (d) All of these.

Directions : In the following questions (101-120), a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as :

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

101. ***Assertion*** : Copper sulphate solution is not stored in zinc vessel.
Reason : Zinc forms complex with $CuSO_4$.

102. ***Assertion*** : Benzene diazonium salt on boiling with water forms phenol.
Reason : C – N bond is polar.

103. ***Assertion*** : *trans*-butene on reaction with bromine forms racemic mixture.
Reason : *trans*-compound in *trans* addition forms two types of stereoisomers.

104. ***Assertion*** : Ozone is an allotrope of oxygen.
Reason : Oxygen is bluish colour liquid and in singlet state it is more paramagnetic.

105. ***Assertion*** : SnI_4 is an orange solid.
Reason : The colour arises due to charge transfer.

106. ***Assertion*** : Acetamide has more polar $\rangle C=O$ group than in ethyl acetoacetate.
Reason : $\ddot{N}H_2$ is more electron donating than $\ddot{O}C_2H_5$.

107. ***Assertion*** : Magnetic moment of Dy is the highest among the lanthanoids.
Reason : Orbital motion contributes magnetic moment.

108. ***Assertion*** : C – O bond in metal carbonyl is long.
Reason : There is delocalisation of electrons from filled *d* orbitals into the empty orbitals on the CO ligands.

109. ***Assertion*** : Chloral reacts with phenyl chloride to form DDT.
Reason : It is an electrophilic substitution reaction.

110. ***Assertion*** : Mixture of CH_3COOH and CH_3COONH_4 is an example of acidic buffer.
Reason : Acidic buffer contains equimolar mixture of weak acid and its salt with weak base.

111. ***Assertion*** : Alkyl iodide can be prepared by treating alkyl chloride/bromide with NaI in acetone.
Reason : NaCl/NaBr are soluble in acetone while NaI is not.

112. ***Assertion*** : F is more electronegative than Cl.
Reason : F has high electron affinity than Cl.

113. ***Assertion*** : Acetylene on reacting with sodamide gives sodium acetylide and ammonia.
Reason : *sp* hybridised carbon atoms of acetylene are considerably electronegative.

114. ***Assertion*** : As a salt such as NaCl dissolves, the Na^+ and Cl^- ions leaving the crystal lattice acquire far greater freedom.
Reason : In thermodyanamic terms, the formation of solution occurs with a favourable change in free energy, *i.e.*, ΔH has a high positive value and $T\Delta S$ a low negative value.

115. ***Assertion*** : Alpha (α)-amino acids exist as internal salt in solution as they have amino and carboxylic acid groups in near vicinity.
Reason : H^+ ion given by carboxylic group (–COOH) is captured by amino group ($-NH_2$) having lone pair of electrons.

116. ***Assertion*** : The kinetics of the reaction –

$$mA + nB + pC \rightarrow m'X + n'Y + p'Z$$

obeys the rate expression as –

$$\frac{dx}{dt} = k[A]^m[B]^n$$

Reason : The rate of reaction does not depend upon the concentration of *C*.

117. ***Assertion*** : Molecular nitrogen is less reactive than molecular oxygen.
Reason : The bond length of N_2 is shorter than that of oxygen.

118. *Assertion* : The lactic acid shows the geometrical isomerism.
Reason : Lactic acid has carbon-carbon double bond.

119. *Assertion* : The equilibrium constant is fixed and a characteristic for any given chemical reaction at a specified temperature.
Reason : The composition of the final equilibrium mixture at a particular temperature depends upon the starting amount of reactants.

120. *Assertion* : The position of an element in periodic table after emission of one α and two β-particles remains unchanged.
Reason : Emission of one α and two β-particles give isotope of the element which acquires same position in periodic table.

BIOLOGY

121. Which of the following is an eye disease?
(a) hepatitis (b) measles
(c) glaucoma (d) bronchitis

122. Which match is true?

	Vitamin deficiency disease	Vitamin	Source
(a)	Severe bleeding	Tocopherol	Milk, egg
(b)	Anaemia	Ascorbic acid	Lemon, orange
(c)	Night blindness	Retinol	Carrot, milk
(d)	Sterility	Calciferol	Milk, butter

123. A child took sugar cane and sucked its juice. Regarding this which of the following match is correct?

	Substrate	Enzyme	Site of secretion of enzyme	Products formed
(a)	Proteins	Pepsin	Duodenum	Polypeptides
(b)	Starch	Amylase	Salivary glands	Glucose
(c)	Lipids	Lipase	Pancreas	Fat globules
(d)	Sucrose	Invertase	Duodenum	Glucose + Fructose

124. Which of the following does not come under the class mammals?
(a) flying fox (b) hedgehog
(c) manatee (d) lamprey

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

126. Which of the following match is correct?

	Hormone	Effect
(a)	Oxytocin	Milk ejection hormone
(b)	Glucagon	Decreases blood sugar level
(c)	Adrenaline	Decreases heart rate
(d)	Thyroxine	Decreases BMR

127. Which of the following statements regarding glucagon is false?
(a) it is secreted by α-cells of Langerhans
(b) it acts antagonistically to insulin
(c) it decreases blood sugar level
(d) the gland responsible for its secretion is heterocrine gland

128. Which of the following is true regarding sperm?
(a) fertilizin : for penetrating egg membrane
(b) hyalurodinase : for penetrating egg membrane
(c) acrosin : dissolves corona radiata
(d) capacitation : takes place in penis

129. Which form of reproduction is correctly matched?
(a) *Euglena* → transverse binary fission
(b) *Paramecium* → longitudinal binary fission
(c) *Amoeba* → multiple fission
(d) *Plasmodium* → binary fission

130. Hearing impairment affects which part of brain?
(a) frontal lobe (b) parietal lobe
(c) temporal lobe (d) cerebellum

131. Which of the following match is correct?
(a) Emphysema : reduction of surface area of alveoli and bronchi
(b) Pneumonia : occupational disease with asbestos
(c) Silicosis : inflammation of alveoli
(d) Asthma : excessive secretion of bronchial mucus

132. The shoulder blade is made of
(a) clavicle (b) humerus
(c) ilium (d) scapula

133. "*Homo sapiens*" implies
(a) human race (b) human beings
(c) modern man (d) none of these

134. "*Omnis-cellula-e-cellula*" was given by
(a) Virchow (b) Hooke
(c) Leeuwenhoek (d) Brown

135. XO-chromosomal abnormality in human beings causes
(a) Turner's syndrome (b) Down's syndrome
(c) Klinefelter's syndrome
(d) none of these.

136. The component of blood which prevents its coagulation in the blood vessels is
(a) haemoglobin (b) plasma
(c) thrombin (d) heparin.

137. Wings of pigeon, mosquito and bat show
(a) divergent evolution
(b) atavism
(c) convergent evolution
(d) all of these.

138. Which of the following is responsible for the mechanical support, protein synthesis and enzyme transport?
(a) cell membrane (b) mitochondria
(c) dictyosome
(d) endoplasmic reticulum.

139. Thickening of arteries due to cholesterol deposition is
(a) arteriosclerosis (b) rheumatic heart
(c) blood pressure (d) cardiac arrest.

140. An example of competitive inhibition of an enzyme is the inhibition of
(a) succinic dehydrogenase by malonic acid
(b) cytochrome oxidase by cyanide
(c) hexokinase by glucose-6-phosphate
(d) carbonic anhydrase by carbon dioxide.

141. Which of the following is the connecting link between glycolysis and Krebs cycle?
(a) acetyl Co-A (b) oxalosuccinic acid
(c) pyruvic acid (d) citric acid

142. Which of the following contain β-1, 4 linkage?
(a) maltose (b) sucrose
(c) lactose (d) fructose

143. What is PAR range?
(a) 200 nm - 800 nm (b) 400 nm - 700 nm
(c) 350 nm - 550 nm (d) 600 nm - 100 nm

144. Which statement is true?
(a) adenine has 4 nitrogen atoms
(b) cytosine has 3 nitrogen atoms
(c) guanosine has 3 nitrogen atoms
(d) uracil has 5 nitrogen atoms

145. Beta diversity is diversity
(a) in a community
(b) between communities
(c) in a mountain gradient
(d) on a plain

146. Which of the following is correct match?

	Disease	**Pathogen**
(a)	Wilt disease	*Synchytrium*
(b)	Citrus canker	*Xanthomonas*
(c)	Red rot of sugarane	*Ustilago*
(d)	Powdery mildew	*Fusarium*

147. Which of the following helps in ascent of sap?
(a) root pressure (b) transpiration
(c) capillarity (d) all of these

148. Which of the following is correct set of micronutrient for plants?
(a) Mg, Si Fe, Cu Ca (b) Cu, Fe, Zn, B, Mn
(c) Mg, Fe, Zn, B, Mn (d) Mo, Zn, Cl, Mg, Ca

149. Velamen present in orchids help in
(a) absorbing water from support
(b) respiration
(c) absorption of moisture from air
(d) synthesising food

150. Hydroponics is
(a) nutrient less culture
(b) water less culture
(c) soilless culture
(d) none of these

151. Leghaemoglobin helps in
(a) nitrogen fixation
(b) protecting nitrogenase from O_2
(c) destroys bacteria
(d) transport of food in plants

152. Which among the following is a rootless plant?
(a) *Nymphaea* (b) *Sagittaria*
(c) *Ceratophyllum* (d) *Vallisneria*

153. Composite fruit develops from
(a) single ovary (b) inflorescence
(c) apocaropous ovary (d) pericarp

154. Ozone in stratosphere extends
(a) 10-20 km (b) 20-25 km
(c) 15-30 km (d) 25-40 km

155. Apomixis is
(a) formation of seeds by fusion of gametes
(b) formation of seeds without syngamy and meiosis
(c) formation of seeds with syngamy but no meiosis
(d) none of the above

156. Cocoa is the plant from which chocolate is made. Which part is used to extract it?
(a) flower (b) fruit
(c) seeds (d) bark

157. If a homozygous red-flowered plant is crossed with a homozygous white-flowered plant, the offsprings will be
(a) half-white flowered
(b) half red-flowered
(c) all white-flowered (d) all red-flowered

158. Gene which suppresses other gene's activity but does not lie on the same locus is called as
(a) epistatic (b) supplementary
(c) hypostatic (d) codominant

159. Pure line breed refers to
(a) heterozygosity only
(b) heterozygosity and linkage
(c) homozygosity only
(d) homozygosity and self assortment

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

Directions : In the following questions (161-180), a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as :

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

161. **Assertion (A) :** Haemophilia is a recessive sex linked disease.
Reason (R) : Haemophilia occurs due to mutation of a structural gene on chromosome 15.

162. **Assertion (A) :** Astigmatism is due to uneven curvature of lens.
Reason (R) : It is treated with cylindrical lenses.

163. **Assertion (A) :** Antigen can be easily recognized because it has antigenic determinants.
Reason (R) : The recognition ability is innate.

164. **Assertion (A) :** Blood coagulate in uninjured blood vessels.
Reason (R) : Uninjured blood vessels release an anticoagulant heparin.

165. **Assertion (A) :** Smaller the organism higher is the rate of metabolism per gram weight.
Reason (R) : The heart rate of a six month old baby is much lower than that of an old person.

166. **Assertion (A) :** Torison can be seen in ctendium.
Reason (R) : Ctenidium acts as the respiratory organ.

167. **Assertion (A) :** The earliest fossil form in the phylogeny of horse is eohippus.
Reason (R) : Eohippus lived during the early pliocene epoch.

168. **Assertion (A) :** Secreting hypotonic urine is effective in reducing urinary loss of water.
Reason (R) : Hypotonic urine is more concentrated and higher in osmotic pressure than the blood.

169. **Assertion (A) :** Aldosterone is a steroid hormone and is important in the control of sodium and potassium ion concentration in mammals.
Reason (R) : It upgrades sodium ion concentration in the ECF by promoting reabsorption of sodium ions from renal tubules and excretion of potassium ions in urine.

170. **Assertion (A) :** Pollution is always caused by human activities.
Reason (R) : Pollution is not different from contamination.

171. **Assertion (A) :** Algae and fungi are classified as thallophytes.
Reason (R) : They both are autotrophs.

172. **Assertion (A) :** Conifer trees produce a large quantity of wind borne pollen grains.
Reason (R) : The pollen grains have wings.

173. **Assertion (A) :** *Neurospora* is commonly called water mould.
Reason (R) : It belongs to basidomycetes fungi.

174. **Assertion (A) :** In woody stems, the amount of heart wood continues to increase year after year.
Reason (R) : The cambial activity continues uniterrupted.

175. **Assertion (A) :** Vernalization is acceleration of subsquent flowering by low temperature treatment.
Reason (R) : Site of vernalization is apical meristem.

176. **Assertion (A) :** Plants absorb sulphur in the form of sulphate ions.
Reason (R) : Sulphur bacteria are required for the formation of sulphate.

177. **Assertion (A) :** Chlorofluorocarbons are responsible for ozone depletion.
Reason (R) : Ozone level decreases by as much as 67% every year.

178. **Assertion (A) :** Dark reaction is purely enzymatic reaction.
Reason (R) : It occurs only in absence of light.

179. **Assertion (A) :** Vegetable oils are fats which are present in plant cells in soluble form.
Reason (R) : Vegetable oils occur only in cells of embryo.

180. **Assertion (A) :** Petroplants produce large amount of latex.
Reason (R) : The latex contains long chain hydrocarbons.

GENERAL KNOWLEDGE

181. Only zero and one are used for operating
(a) Calculator (b) Computer
(c) Abacus (d) Type writer

182. Transistor is
(a) semi conductor (b) inductor
(c) modulator (d) demodulator

183. Computer cannot
(a) send message (b) abstract thought
(c) read files (d) play music

184. Which of the following is not a carbohydrate
(a) wax (b) starch
(c) sucrose (d) maltose

185. Which of the following is an eye disease?
(a) hepatitis (b) measles
(c) glaucoma (d) bronchitis

186. Which of the following is the vaccine for tuberculosis?
(a) DPT (b) BCG
(c) salk vaccine (d) rubella vaccine

187. Horns, nails and hair are
(a) soluble fats
(b) insoluble carbohydrates
(c) keratin proteins (d) complex lipids

188. Who conducts the State assembly elections?
(a) Chief Justice of the High Court concerned
(b) Chief Justice of the Supreme Court
(c) Chief Election Commission
(d) Governor of the state concerned

189. Which is an ore of aluminium?
(a) chromite (b) cuprite
(c) bauxite (d) siderite

190. Kalidas was
(a) A poet during the Gupta period
(b) A dramatist during Harshvardhana's reign
(c) An astronomer during Gupta period
(d) None of these

191. Which mirror is used as a rear view mirror in vehicles?
(a) plain (b) convex
(c) concave (d) spherical

192. The compilation "Meri Ekyawan Kavitayen's is by
(a) A.B. Vajpayee
(b) Harivanshrai Bachchan
(c) Dharam Vir Bharti
(d) Shiv Mangal Singh Suman

193. 'Equinox' means
(a) days are longer than nights
(b) days and nights are equal
(c) days are shorter than nights
(d) none of these

194. Who was known as "Nightingale of India"?
(a) Vijaylaxmi Pandit (b) Sarojini Naidu
(c) Suraiya (d) None of these

195. Gaya is associated with Lord buddha, where he
(a) was born
(b) attained enlightenment
(c) died
(d) delivered his first sermon

196. Chemical change does not take place in
(a) souring of milk into curd
(b) rusting of iron in atmosphere
(c) burning of magnesium ribbon in air
(d) emitting of light by a red hot platinum wire

197. Who is the highest wicket taker in Indian Cricket team?
(a) Javagal Srinath (b) Anil Kumble
(c) Maninder Singh (d) Kapil Dev

198. Which country leads in production of aluminium and aluminium goods
(a) Australia (b) U.S.
(c) Russia (d) Japan

199. Which of the following places was known as a centre of learning in ancient India?
(a) Nalanda (b) Ujjain
(c) Allahabad (d) none of these

200. The process of transfer of heat by matter but without actual movement of the particles themselves is called
(a) conduction (b) convection
(c) radiation
(d) none of the above