SOLVED PAPER
AIIMS - 1994

Time : 3½ Hours Max. Marks : 200

PHYSICS

1. For Boyle's law to hold good, the gas should be
(a) perfect and at constant temperature but variable mass
(b) perfect and of constant mass and temperature
(c) real and at constant temperature but variable mass
(d) real and of constant mass and temperature.

2. The composition of two simple harmonic motions of equal periods at right angles to each other and with a phase difference of π, results in the displacement of the particle along a
(a) straight line (b) circle
(c) hexagon (d) ellipse.

3. The bulb of one thermometer is spherical, while that of other is cylindrical. If both of them have equal amounts of mercury, which one will respond quickly to the temperature ?
(a) elliptical (b) spherical
(c) cylindrical (d) both (b) and (c).

4. The surface tension of a liquid decreases with a rise in
(a) diameter of container
(b) temperature of the liquid
(c) thickness of container
(d) viscosity of the liquid.

5. The angle of a prism is 6° and its refractive index for green light is 1.5. If a green ray passes through it, the deviation will be
(a) 3° (b) 30°
(c) 0° (d) 15°.

6. A body 'A' is dropped vertically from the top of a tower. If another identical body 'B' is projected thrown from the same point at the same instant, then
(a) both 'A' and 'B' will reach the ground simultaneously
(b) 'A' will reach the ground earlier than 'B'
(c) 'B' will reach the ground earlier than 'A'
(d) either 'A' or 'B'.

7. Two satellites of mass m_1 and m_2 ($m_1 > m_2$) are going around the earth in orbits of radius r_1 and r_2 ($r_1 > r_2$). Which statement about their velocities is correct?
(a) $v_1 < v_2$ (b) $v_1 > v_2$
(c) $v_1/r_1 = v_2/r_2$ (d) $v_1 = v_2$.

8. If C_P and C_V are the specific heats for a gas at constant pressure and at constant volume respectively, then the relation $C_P - C_V = R$ is exact for
(a) ideal gas and nearly true for real gases at high pressure
(b) ideal and real gases at all pressures
(c) ideal gas and nearly true for real gases at moderate pressure
(d) ideal gas at all pressure and real gas at moderate pressure.

9. In what manner does the escape velocity of a particle depend upon its mass?
(a) m^0 (b) m^2
(c) m^{-1} (d) m.

10. A small piece of metal wire is dragged across the gap between the pole pieces of a magnet in 0.4 sec. If magnetic flux between the pole pieces is known to be 8×10^{-4} Wb, then induced emf in the wire, is
(a) 4×10^{-3} V (b) 8×10^{-3} V
(c) 2×10^{-3} V (d) 6×10^{-3} V.

11. The frequency of a tuning fork is 256. It will not resonate with a fork of frequency
(a) 738 (b) 256
(c) 768 (d) 512.

12. If the normal force is doubled, the coefficient of friction, is
(a) doubled (b) halved
(c) not changed (d) tripled.

13. At what angle of incidence will the light reflected from glass (m = 1.5) be completely polarized ?
(a) 56.3° (b) 40.3°
(c) 72.8° (d) 51.6°.

14. Which of the following is not true for the given statement: Photoelectric effect supports the quantum nature of light?
(a) if metal surface is faintly illuminated, then photoelectrons leave the surface
(b) there is a minimum frequency of light below which no photoelectrons are emitted
(c) electric charge of the photoelectrons is quantized
(d) None of these

15. In a vessel, the gas is at a pressure P. If the mass of all the molecules is halved and their speed is doubled, then the resultant pressure will be
(a) P (b) $4P$
(c) $P/2$ (d) $2P$.

16. If the radius of earth shrinks by one percent and its mass remaining the same, then acceleration due to gravity on the earth's surface will
(a) remain constant (b) decrease
(c) increase (d) either (b) or (c).

17. A gas behaves as an ideal gas at
(a) high pressure and low temperature
(b) low pressure and high temperature
(c) high pressure and high temperature
(d) low pressure and low temperature.

18. The radius of a soap bubble is r and the surface tension of soap solution is T. Keeping the temperature constant, the extra energy needed to double the radius of the soap bubble by blowing, is
(a) $16\ \pi r^2T$ (b) $32\ \pi r^2T$
(c) $8\ \pi r^2T$ (d) $24\ \pi r^2T$.

19. The dimension of the modulus of rigidity, is
(a) $[ML^{-2}T^{-2}]$ (b) $[MLT^{-2}]$
(c) $[ML^{-1}T^{-1}]$ (d) $[ML^{-1}T^{-2}]$.

20. One nanometre is equal to
(a) 10^{-7} cm (b) 10^{9} mm
(c) 10^{-9} m (d) 10^{-6} cm.

21. A particle revolves round a circular path. The acceleration of the particle is inversely proportional to
(a) mass of particle (b) radius
(c) velocity (d) both (a) and (b).

22. A certain logic circuit has A and B as the two inputs and Y as the output. What is the logic gate in the circuit, if the truth table of the circuit is as shown

	A	B	Y
(a) XOR	0	0	0
(b) OR	0	1	1
(c) NOR	1	0	1
(d) NAND	1	1	0

23. Two lenses of power + 12 D and - 2 D are combined together. What is their equivalent focal length ?
(a) 16.6 cm (b) 10 cm
(c) 8.33 cm (d) 12.5 cm.

24. How many wavelengths of Kr_{86} are there in one metre?
(a) 2348123.73 (b) 1553164.13
(c) 652189.63 (d) 1650763.73.

25. A metal plate gets heated, when cathode rays strike against it, due to
(a) linear velocity of cathode rays
(b) kinetic energy of cathode rays
(c) angular velocity of cathode rays
(d) potential energy of cathode rays.

26. A missile is launched with a velocity less than the escape velocity. The sum of its kinetic and potential energies, is
(a) positive (b) zero
(c) negative (d) first (b) then (c).

27. If the earth is treated as a sphere of radius R and mass M, its angular momentum about the axis of its rotation with period T, is
(a) $\frac{MR^2T}{2\pi}$ (b) $\frac{4\pi MR^2}{5T}$
(c) $\frac{\pi MR^3}{T}$ (d) $\frac{2\pi MR^2}{T}$

28. A pure semiconductor has a/an
(a) finite resistance which decreases with temperature
(b) infinite resistance at 0°C
(c) finite resistance which increases with temperature
(d) finite resistance which does not depend upon temperature.

29. Antimony and Bismuth are usually used in thermocouple, because

(a) a constant thermo e.m.f. is produced
(b) higher thermo e.m.f. is produced
(c) a negative thermo e.m.f. is produced
(d) lower thermo e.m.f. is produced.

30. With an increase in temperature, the electrical conductivity of intrinsic semiconductor
(a) remains unchanged (b) increases
(c) decreases (d) first (b) then (c).

31. Kinetic energy, with any reference, must be
(a) negative (b) zero
(c) positive (d) both (b) and (c).

32. All the known planets move in
(a) elliptical path (b) straight path
(c) hyperbolic path (d) circular path.

33. The dual nature of light is exhibited by
(a) photoelectric effect
(b) diffraction and reflection
(c) diffraction and photoelectric effect
(d) refraction and interference.

34. The neutron was discovered by
(a) Rutherford (b) Marie Curie
(c) James Chadwick (d) Pierre Curie.

35. Approximately, the temperature corresponding to 1 eV energy, is
(a) $7 \cdot 6 \times 10^2$ K (b) $7 \cdot 7 \times 10^3$ K
(c) $7 \cdot 1 \times 10^{-2}$ K (d) $7 \cdot 2 \times 10^3$ K.

36. One cannot see through fog, because
(a) refractive index of the fog is infinity
(b) fog absorbs the light
(c) light is scattered by the droplets
(d) light suffers total reflection at droplets.

37. The potential energy possessed by a soap bubble, having surface tension equal to 0·04 N/m of diameter 1 cm, is
(a) $6\pi \times 10^{-6}$ J (b) $2\pi \times 10^{-6}$ J
(c) $8\pi \times 10^{-6}$ J (d) $4\pi \times 10^{-6}$ J.

38. There is no atmosphere on the moon, because
(a) escape velocity of gas molecules is less than their root mean square velocity
(b) it is closer to the earth and also it has the inactive inert gases in it
(c) escape velocity of gas molecules is greater than their root mean square velocity
(d) it is too far from the sun and has very low pressure in its outer surface.

39. In nuclear reactors, the controlling rods are made of
(a) stainless steel (b) cadmium
(c) plutonium (d) graphite.

40. The orbital speed of jupiter, is
(a) equal to the orbital speed of earth
(b) greater than the orbital speed of earth
(c) proportional to the distance from the earth
(d) less than the orbital speed of earth.

41. In Bohr model of hydrogen atom, which of the following is quantised ?
(a) linear momentum of electron
(b) linear velocity of electron
(c) angular momentum of electron
(d) angular velocity of electron.

42. In a boiling water reactor, the boiling water is used as a
(a) moderator (b) fuel
(c) controller (d) coolant.

43. Which of the following physical quantity has the dimensions of $[ML^2T^{-3}]$?
(a) pressure (b) work
(c) impulse (d) power.

44. What is missing in the following nuclear reaction ${}_1H^2 + {}_1H^2 \rightarrow {}_2He^3 + ?$
(a) positron (b) meson
(c) neutron (d) electron.

45. The concept of rotating magnetic field, which is the basis of practically all alternating current machinery, was conceived by
(a) Plank (b) Tesla
(c) Franck and Hertz (d) Young.

46. A strong argument for the particle nature of cathode rays is that they
(a) travel through vacuum
(b) cast shadow
(c) get deflected by electric and magnetic field
(d) produce fluorescence.

47. A bulb contains one mole of hydrogen mixed with one mole of oxygen at temperature T. The ratio of r.m.s. values of velocity of hydrogen molecules to that of oxygen molecules, is
(a) 4 : 1 (b) 1 : 16
(c) 1 : 4 (d) 16 : 1.

48. The shortest wavelength of X-rays, emitted from a X-ray tube, depends upon

(a) nature of glass material in the tube
(b) current in the tube
(c) atomic number of the target material
(d) voltage applied to the tube.

49. A constant pressure air thermometer gave a reading of 47·5 units of volume when immersed in ice-cold water, and 67 units in a boiling liquid. The boiling point of the liquid, is
(a) 125°C (b) 100°C
(c) 135°C (d) 112°C.

50. β-rays, emitted from a radioactive material, are known as
(a) charged particles emitted by nucleus
(b) neutral particles
(c) electrons orbiting around the nucleus
(d) electromagnetic radiations.

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(c) If Assertion is true but the Reason is false.
(d) If both Assertion and Reason are false.

51. *Assertion*: The energy gap between the valence band and conduction band is greater in silicon than in germanium.
Reason: Thermal energy produces fewer minority carriers in silicon than in germanium.

52. *Assertion*: In the process of nuclear fission, the fragments emit two or three neutrons as soon as they are formed and subsequently emit particles.
Reason: As the fragments contain an excess of neutrons over protons, emission of neutrons and particles bring their neutron/proton ratio to stable values.

53. *Assertion*: If a heavy nucleus is split into two medium sized parts, each of the new nuclei will have more binding energy per nucleon than the original nucleus.
Reason: Joining two light nuclei together to give a single nucleus of medium size means more binding energy per nucleon in the new nucleus.

54. *Assertion*: In the absence of an externally applied electric field, the displacement per unit volume of a polar dielectric material is always zero.
Reason: In polar dielectrics, each molecule has a permanent dipole moment but these are randomly oriented in the absence of an externally applied electric field.

55. *Assertion*: It is not possible for a system, unaided by an external agency to transfer heat from a body at a lower temperature to another at a higher temperature.
Reason: It is not possible to violate the Second Law of Thermodynamics.

56. *Assertion*: When two vibrating tuning forks having frequencies 256 Hz and 512 Hz are held near each other, beats cannot be heared.
Reason: The principle of superposition is valid only if the frequencies of the oscillators are nearly equal.

57. *Assertion*: A single lens produces a coloured image of an object illuminated by white light.
Reason: The refractive index of the material of lens is different for different wavelengths of light.

58. *Assertion*: Resonance is a special case of forced vibration in which the natural frequency of vibration of the body is the same as the impressed frequency and the amplitude of forced vibration, is maximum.
Reason: The amplitude of forced vibrations of a body increases with an increase in the frequency of the externally impressed periodic force.

59. *Assertion*: At room temperature water does not sublimate from ice to steam.
Reason: The critical point of water is much above the room temperature.

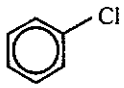
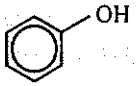
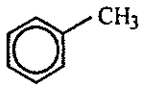
60. *Assertion*: The shape of an automobile is so designed that its front resembles the streamline pattern of the fluid through which it moves.
Reason: The resistance offered by the fluid is maximum.

CHEMISTRY

61. The heat liberated when 1·89 g of benzoic acid is burnt in a bomb calorimeter at 25°C increases the temperature of 18.94 kg of water by 0.632°C. If the specific heat of water at 25°C is 0·998 cal/g-deg, the value of the heat combustion of benzoic acid is
(a) 881·1 kcal (b) 771·4 kcal
(c) 981·1 kcal (d) 871·2 kcal.

62. When ethanal is treated with fehling's solution, it gives a precipitate of
(a) Cu_2O (b) Cu
(c) Cu_3O (d) CuO.

63. Which of the following is not true about e.m.f. of a cell?
(a) work calculated from it is not the maximum work obtainable from the cell
(b) it is maximum voltage obtainable from the cell
(c) it is the potential difference between two electrodes when no current is flowing in circuit
(d) it is responsible for the flow of steady current in the cell.

64. Which of the following compounds will be most easily attacked by an electrophile ?
(a)  (b) 
(c)  (d) 

65. Which of the following shows bond in silicone?
(a) Si-C-Si-C-Si (b) Si-Si-Si-Si
(c) -Si-O-Si-O-Si- (d) Si-C-Si-O-Si.

66. If the density ratio of O_2 and H_2 is 16 : 1, then ratio of their V_{rms} will be
(a) 1 : 1 (b) 1 : 4
(c) 16 : 1 (d) 1 : 16.

67. Which of the following gases will have the highest rate of diffusion ?
(a) CO_2 (b) N_2
(c) NH_3 (d) O_2.

68. Which one is the strongest of the following acids?
(a) CCl_3COOH (b) HCOOH
(c) $CH_2ClCOOH$ (d) CH_3COOH.

69. In Wolf-Kishner reduction, the carbonyl group of aldehydes and ketones is converted into
(a) $-CH_2OH$ (b) $-CH_2-$
(c) $-CH_3$ (d) -CHOH-.

70. When propyne is treated with aqueous H_2SO_4, in the presence of $HgSO_4$, the product formed is
(a) acetone (b) ether
(c) aldehyde (d) propanal.

71. Which metal is present in brass, bronze and german-silver ?
(a) Mg (b) Al
(c) Zn (d) Cu.

72. When alkyl halides are heated, with dry Ag_2O, they give
(a) diethyl ether (b) ester
(c) benzene (d) ketone.

73. Which of the following is called an ethanoic acid?
(a) CH_3CH_2COOH
(b) HCOOH
(c) $CH_3CH_2CH_2COOH$
(d) CH_3COOH.

74. Ethyl alcohol exhibits acidic character on reacting with
(a) hydrogen iodide (b) acetic acid
(c) sodium metal (d) all of these.

75. The type of isomerism not exhibited by alkenes is
(a) chain isomerism (b) metamerism
(c) position isomerism (d) stereoisomerism.

76. Which of the following compound gives Cannizzaro's reaction ?
(a) CH_3CH_2CHO (b) HCHO
(c) $(CH_3)_2CHCHO$ (d) CH_3CHO.

77. The formation of 2-butene as a major product by dehydration of 2-butanol is in accordance with
(a) Blanc rule (b) Huckel rule
(c) Markiownikoff's rule
(d) Saytzeff's rule.

78. $MgCl_2 \cdot 6\ H_2O$ when heated gives
(a) magnesium dichloride
(b) magnesium oxide
(c) magnesium oxychloride
(d) magnesium chloride.

79. Permanent hardness of water can be removed by adding
(a) Na_2CO_3 (b) K
(c) Ca(OCl)Cl (d) Cl_2.

80. Which of the following metal reacts with water ?
(a) copper (b) nickel
(c) sodium (d) silver.

81. Which of the following is an alum ?
(a) $FeSO_4(NH_4)_2SO_4 \cdot 6H_2O$
(b) $NaAlO_2$
(c) $Na_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24\ H_2O$
(d) $KCl \cdot MgCl_2 \cdot 6H_2O$.

82. The number of electrons in $[_{19}K^{40}]^{-1}$ is
(a) 28 (b) 19
(c) 40 (d) 20.

83. Which of the following glasses is the most heat resistant ?
(a) bottle glass (b) flint glass
(c) water glass (d) pyrex glass.

84. Number of water molecules in Mohr's salt is
(a) 7 (b) 5
(c) 8 (d) 6.

85. The molecular mass of a volatile substance may be measured by
(a) Liebig's method
(b) Hofmann's method
(c) Victor Meyer's method
(d) none of these.

86. Which of the following will not undergo aldol condensation ?
(a) propionaldehyde (b) acetone
(c) formaldehyde (d) acetaldehyde.

87. Heterolytic fission of an organic covalent bond gives only
(a) anion (b) free radicals
(c) cation (d) both (a) and (c).

88. Which of the following elements will have the highest electron affinity ?
(a) chlorine (b) nitrogen
(c) phosphorus (d) flourine.

89. In which cell the free energy of a chemical reaction is directly converted into electricity ?
(a) concentration cell (b) fuel cell
(c) lead storage battery
(d) lechlanche cell.

90. Aspirin is an acetylation product of
(a) m-hydroxybenzoic acid
(b) o-hydroxybenzoic acid
(c) p-dihydroxybenzene
(d) o-dihydroxybenzene.

91. Which of the following is a strong reducing agent?
(a) Cr (b) Cl
(c) Na (d) Ca.

92. The number of electrons and neutrons of an element is 18 and 20 respectively. Its mass number is
(a) 37 (b) 17
(c) 38 (d) 22.

93. Which is an oxidising substance amongest the following?
(a) SO_2 (b) CO_2
(c) SO_3 (d) NO_2.

94. When chloroform is exposed to air and sunlight, it gives
(a) mustard gas
(b) phosgene
(c) carbon tetrachloride
(d) lewisite.

95. The long form of Periodic Table is based on
(a) mass of the atom (b) atomic number
(c) shapes of the atom (d) electronegativity.

96. Which of the following gas is produced in the reaction: $KO_2 + CO_2$?
(a) O_2 (b) H_2
(c) CO (d) N_2.

97. Which of the following is a Lewis-acid ?
(a) Br^- (b) Cl^-
(c) S^- (d) Ag^+.

98. Which one of the following can differentiate between C_2H_5OH and CH_3OH ?
(a) H_2O (b) HCl
(c) I_2 + KOH (d) NH_3.

99. A catalyst is used to
(a) minimise the time of rate of reaction
(b) increases the product
(c) decrease the product
(d) none of these.

100. The number of water molecules in gypsum and plaster of paris is respectively
(a) 5 and 2 (b) 2 and 1/2
(c) 7 and 2 (d) 2 and 1.

101. Which of the following is called Baeyer's reagent?
(a) alkaline $KMnO_4$ solution
(b) saturated $KMnO_4$ solution
(c) acidic $KMnO_4$ solution
(d) neutral $KMnO_4$ solution.

102. The weight of a metal of equivalent weight 12, which will give 0·475 g of its chloride, is
(a) 0·18 g (b) 0·12 g
(c) 0·24 g (d) 0·16 g.

103. A mixture of 40 g of oxygen and 40 g of helium has a total pressure of 0·9 atm. The partial pressure of oxygen is
(a) 0·5 atm (b) 0·1 atm

(c) 0.9 atm (d) 0.2 atm.

104. The law of equilibrium was first given by
(a) Boyle (b) Goldberg
(c) Waage (d) both (b) and (c).

105. A bivalent metal has the equivalent weight of 12. The molecular weight of its oxide will be
(a) 36 (b) 24
(c) 40 (d) 32.

106. The position of both an electron and helium atom is known within 1.0 nm. The momentum of the electron is known within 5.0×10^{-26} kg ms^{-1}. The minimum uncertainty in the measurement of the momentum of the helium atom is
(a) 7.0×10^{-26} kg ms^{-1} (b) 5.0×10^{-26} kg ms^{-1}
(c) 8.0×10^{-26} kg ms^{-1} (d) 6.0×10^{-26} kg ms^{-1}.

107. According to Dalton's atom theory, the smallest particle in which matter can exist, is called
(a) an electron (b) an atom
(c) a molecule (d) an ion.

108. Which of the following expression gives the de Broglie relationship?

(a) $\lambda = \frac{h}{mp}$ (b) $\frac{h}{mv} = p$

(c) $\lambda m = \frac{v}{p}$ (d) $\lambda = \frac{h}{mv}$.

109. Which of the following statement regarding entropy is correct ?
(a) at absolute zero temperature, the entropy of all crystalline substances is taken to be zero
(b) at 0°C, the entropy of all crystalline substances is taken to be zero
(c) at absolute zero temperature,entropy of a perfect crystalline substance is taken to be zero
(d) at 0°C, the entropy of a perfect crystalline substance is taken to be zero.

110. The compound containing co-ordinate bond is
(a) SO_3 (b) O_3
(c) H_2SO_4 (d) all of these.

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(d) If both Assertion and Reason are false.

111. *Assertion*: The first ionization energy of aluminium is lower than that of magnesium
Reason: The ionic radius of aluminium is smaller than that of magnesium.

112. *Assertion*: Alkanes having more than three carbon atoms exhibit chain isomerism
Reason: All carbon atoms in alkanes are *sp*-hybridized.

113. *Assertion*: A solution of $KMnO_4$ is decolourized by SO_2.
Reason: SO_2 is acidic in character.

114. *Assertion*: Helium and berylium having similar outer electronic configuration of type ns^2.
Reason: Both are chemically inert.

115. *Assertion*: Ionic compounds tend to be non-volatile.
Reason: The inter-molecular forces in these compounds are weak.

116. *Assertion*: Reaction of conc. H_2SO_4 on NaBr & NaI does not give HBr and HI.
Reaction: Both HBr and HI are oxidized by conc. H_2SO_4 to Br_2 and I_2.

117. *Assertion*: Ethers behave as bases in the presence of mineral acids.
Reason: Due to the presence of lone pair of electrons on the oxygen.

118. *Assertion*: Physical adsorption of molecules on surface requires activation energy.
Reason: Because the bonds of the adsorbed molecules are broken.

119. *Assertion*: The boiling point of ethanol is much higher than that of diethyl ether.
Reason: In ethanol, the molecules are associated by the formation of intermolecular hydrogen bonding, whereas in diethyl ether it is not possible.

120. *Assertion*: Halogens do not occur in free state.
Reason: Halogens are highly reactive.

BIOLOGY

121. Cartilage is formed by
(a) chondrocytes (b) osteoblasts
(c) osteoclasts (d) fibroblasts.

122. Achondroplasia is a disease related with the defect in the formation of
(a) membrane (b) cartilage
(c) bone (d) mucosa.

123. Philadelphia chromosome is found in the patient suffering from
(a) albinism
(b) insomia
(c) myelocytic leukaemia
(d) hepatitis.

124. Diabetes insipidus occurs due to the hyposecretion of
(a) thymosine (b) oxytocin
(c) insulin (d) vasopressin.

125. Steroid hormones are almost similar in structure to
(a) triglyceride (b) tyrosine
(c) coenzyme-A (d) cholesterol.

126. The golden age of reptiles was
(a) mesozoic era (b) palaeozoic era
(c) proterozoic era (d) coenozoic era.

127. Colour blindness, in which all colours are perceived as gray, is termed as
(a) monochromasia (b) chromasia
(c) dichromasia (d) all of these.

128. Which of the following layer of epidermis in man provides the main protection of body against water loss and the entry of disease causing organisms ?
(a) stratum lucidium (b) stratum spirosum
(c) stratum germinativum
(d) stratum corneum.

129. Which of the following cell type is capable of giving rise to other cell types in sponges ?
(a) archaeocytes (b) pinacocytes
(c) collencytes (d) thesocytes.

130. Outer covering of cartilage is known as
(a) endosteum (b) perichondrium
(c) peritonium (d) periosteum.

131. Which of the following is made up of a single bone in mammals ?
(a) lower jaw (b) hyoid
(c) zygomatic arch (d) upper jaw.

132. The daughters born to haemophilic father and normal mother could be
(a) haemophilic (b) normal
(c) carrier (d) all of these.

133. Schuffner's dots are seen in red blood corpuscles of man due to which of the following disease?
(a) malaria (b) kala-azar
(c) diabetes (d) filaria.

134. The contractile element present in a striated muscle fibril, between two successive Z-lines, is called
(a) sarcomere (b) sarcoplasm
(c) sarcosomes (d) all of these.

135. Which of the following is a vestigial structure in python ?
(a) hind limbs (b) teeth
(c) poison glands (d) scales.

136. Which of the following cranial nerve of man is both sensory and motor ?
(a) olfactory (b) optic
(c) trigeminal (d) vagus.

137. Which of the following is respiratory organ of scorpion ?
(a) gills (b) lungs
(c) ctenidia (d) book lungs.

138. Which of the following is an essential fatty acid in mammals ?
(a) palmitic acid (b) stearic acid
(c) gama-linolenic acid (d) acetic acid.

139. The state, during which the respiratory centre is inhibited, is termed as
(a) anoxia (b) asphyxia
(c) suffocation (d) choking.

140. Glissonian cirrhosis is a disease related with
(a) liver (b) lung
(c) pancreas (d) spleen.

141. Which of the following does not produce any digestive enzyme ?
(a) pancreas (b) mouth
(c) gastric mucosa (d) liver.

142. Zonula adherens is a kind of
(a) filament (b) desmosome
(c) membrane (d) mesosome.

143. Lymphoid tissue is found in
(a) lymph nodes (b) thymus
(c) tonsils (d) all of these.

144. Hamburger's phenomenon is also known as
(a) chloride shift mechanism

(b) sodium-potassium pump
(c) carbonic acid shift mechanism
(d) hydrogen shift mechanism.

145. Which of the following carries blood rich in food materials, such as glucose and amino acids, from intestine to liver ?
(a) renal portal vein
(b) dorsal aorta
(c) hepatic portal vein
(d) mesenteric artery.

146. Bacteria with flagella all over its body, is called
(a) monotrichous (b) amphitrichous
(c) lophotrichous (d) peritrichous.

147. Which of the following terms represents a pair of contrasting character ?
(a) homozygous (b) allele
(c) heterozygous (d) phenotypes.

148. 'Genera Plantarum' was written by
(a) Hutchinson (b) Bessey
(c) Bentham and Hooker
(d) Linnaeus.

149. A set of bacterial clones, each containing a plasmid or phage, is called
(a) gene library (b) gene pool
(c) genophore (d) genome.

150. The transfer of genetic material of one bacterium to another by virus is called
(a) transcription (b) translation
(c) replication (d) transduction.

151. Maize has ten pairs of chromosomes. How many linkage groups will be present, if all the genes are mapped?
(a) 20 (b) 5
(c) 40 (d) 10.

152. The complete set of chromosome, inherited as a single unit, from one parent, is known as
(a) genome (b) linkage
(c) gene pool (d) genotype.

153. Which of the following are initiator codons ?
(a) UGA and UAG (b) UUU and UUC
(c) AUG and GUG (d) UAA and UAG.

154. A pigment, which absorbs red and far red light, is
(a) cytochrome (b) phytochrome
(c) xanthophyll (d) carotene.

155. The epistatic effect, in which the dihybrid cross 9 : 3 : 3 : 1 between Aa Bb' Aa bb is modified as
(a) dominance of one allele on another allele of both loci
(b) interaction between two alleles of different loci
(c) dominance of one allele on another allele of same loci
(d) interaction between two alleles of same loci.

156. Which of the following is known as 'resurrection plant'?
(a) *Rafflesia* (b) *Selaginella*
(c) *Chlorella* (d) *Welwitschia.*

157. The jumping genes are called
(a) cistrons (b) mutons
(c) transposons (d) recons.

158. The leaves of *Mimosa pudica* droop down, when touched due to
(a) seismonasty (b) photonasty
(c) epinasty (d) nyctinasty.

159. When pollen grains are not transferred from anthers to stigma in a flower, due to the barrier, it is called
(a) cleistogamy (b) herkogamy
(c) dichogamy (d) heterogamy.

160. The pairing of homologous chromosomes in meiosis is known as
(a) bivalent (b) synapsis
(c) disjunction (d) synergids.

161. Nodules with nitrogen fixing bacteria are present in
(a) wheat (b) cotton
(c) mustard (d) gram.

162. Which of the following explains, how progeny can possess the combinations of traits that none of the parent possessed ?
(a) law of segregation
(b) chromosome theory
(c) law of independent assortment
(d) polygenic inheritance.

163. The presence of continuous phenotypic variation in an F_1-generation suggests that a character is inherited by
(a) gene linkage
(b) epistasis
(c) polygenic inheritance
(d) recombination.

164. The new strand synthesised, in small pieces and then joined together during DNA replication, is called
(a) dead strand (b) lagging strand
(c) leading stand (d) all of these.

165. *Parkinsonia* is a good example of
(a) winged fruit
(b) phyllode
(c) parachute mechanism
(d) phylloclade.

166. Inflorescence, which begins as a dichasial cyme and ends in a monochasial cyme, is called
(a) cyathium (b) biparous
(c) verticillaster (d) thyrsus.

167. Cyanobacteria is a new name for
(a) mycoplasma (b) *Nostoc*
(c) myxophyceae (d) myxomycetes.

168. The thallus of *Volvox* is called
(a) coenocyte (b) filament
(c) heterotrichous (d) coenobium.

169. The similarity between bacterium and cyanobacterium is in the presence of
(a) chloroplast (b) flagella
(c) 80 S ribosomes (d) nucleoid.

170. The five-kingdom classification was suggested by
(a) Engler and Prantl (b) Eichler
(c) Bentham and Hooker
(d) Whittaker.

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

171. *Assertion*: A cholera patient is given glucose, electrolytes and water.
Reason: These plasmolyse the disease causing germs.

172. *Assertion*: It is considered advantageous to give the polio vaccine orally.
Reason: It prevents reinfection by causing intestinal immunity.

173. *Assertion*: Calamine lotion is recommended for applying on chickenpox rashes.
Reason: It gives relief by attenuating the chickenpox virus.

174. *Assertion*: Typhoid carriers may be cured by surgical removal of their spleen.
Reason: The disease germs remain concentrated in it.

175. *Assertion*: A father may be a haemophilic only if his mother is carrier.
Reason: The father cannot pass on a sex-linked gene to his son.

176. *Assertion*: Plants possessing C_4-pathway of carbon fixation have a higher net primary productivity than the C_3-pathway possessing plants.
Reason: For each unit weight of fixed carbon, C_4-pathway possessing plants require less water than the C_3-pathway possessing plants.

177. *Assertion*: A single strand of *m*-RNA is capable of forming a number of different polypeptide chains.
Reason: Termination codons occur in *m*-RNA.

178. *Assertion*: Action spectrum of photosynthesis compares well with the absorption spectrum of chlorophyll.
Reason: Chlorophyll is the only pigment which can absorb and convert light energy into chemical energy.

179. *Assertion*: The non-allelic genes for red hair and freckles are usually inherited together.
Reason: The genes for red hair and freckles are located on same chromosome in close association

180. *Assertion*: Chromosomal aberrations are caused by a break in the chromosome or its chromatid.
Reason: Duplication, deficiency, transversion and translocations are the result of chromosomal aberrations.

GENERAL KNOWLEDGE

181. The world's biggest airport is situated in
(a) USA (b) India
(c) Britain (d) France.

182. 'OSI' is stands for
(a) open system information
(b) open system interface

(c) out dated system insertion
(d) open system interconnection.

183. Which of the following official document is related with India?
(a) green paper
(b) white paper (c) yellow book
(d) blue book.

184. A chest disease, whose attack causes difficult breathing and suffocation, is known as
(a) blood-pressure (b) arthritis
(c) cancer (d) asthma.

185. 'Panchayat' is the parliament of
(a) Nepal (b) Spain
(c) Iran (d) Bangladesh.

186. Which of the following are the vital organs?
(a) eyes (b) nostrils
(c) heart (d) ears.

187. Which of the following city has the largest statue in India ?
(a) Madras (b) Delhi
(c) Hyderabad (d) Bombay.

188. 'Skylab' is a
(a) a series of U.S. space probes to explore the solar system
(b) re-usable manned space craft
(c) USA's space station in which astronauts lived and worked in space
(d) a large space craft equipped for manned mission of long duration.

189. The first European invader of Indian soil was
(a) Macmillan
(b) Marco polo
(c) Alexander the great
(d) Fahien.

190. 'Adi Granth' was written by
(a) Guru Gobind Singh
(b) Guru Arjun Dev
(c) Guru Teg Bahadur
(d) Guru Nanak Dev.

191. The height of 'Kanchanjunga peak' in Himalayas, is
(a) 8535 m (b) 8848 m
(c) 8470 m (d) 8611 m.

192. 'Damodar River' is the sorrow of
(a) Maharashtra (b) Bengal
(c) Nagaland (d) Assam.

193. The longest railway tunnel in the world is, located at
(a) South Africa (b) America
(c) Japan (d) China.

194. 'Dhariwal' is known for the production of
(a) Fertilisers (b) soaps
(c) woolen goods (d) sport goods.

195. 'Kozhikode' is the new name of which of the following city?
(a) Paradeep (b) Cochin
(c) Calicut (d) Khandala.

196. Rubber plants are mostly located in
(a) West Bengal and Bihar
(b) Andhra Pradesh and Tamil Nadu
(c) Maharashtra and Himachal Pradesh
(d) Karnataka and Kerla.

197. The capital of Lakshadweep, is
(a) Kavaratti (b) Port Blair
(c) Kohima (d) Silvasa.

198. Which of the following state is most adversely affected by trophical cyclones?
(a) Gujrat (b) Assam
(c) Kerala (d) Orissa.

199. Which of the following is not a Rabi crop?
(a) groundnut (b) wheat
(c) oil seeds (d) gram.

200. The place, which experiences minimum temperature in winter is
(a) Shimla (b) Srinagar
(c) Manali (d) Leh.

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