AIIMS - 2006

Full Paper

Physics

1. A wire mesh consisting of very small squares is viewed at a distance of 8 cm through a magnifying converging lens of focal length 10 cm, kept close to the eye. The magnification produced by the lens is :

   1) 5
   2) 9
   3) 13
   4) 19

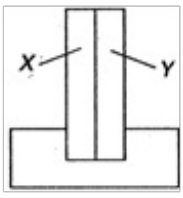
2. A lens is made of flint glass (refractive, index = 1.5). When the lens is immersed in a liquid of refractive index 1.25, the focal length :

   1) increases by a factor of 1.5
   2) increases by a factor of 2.5
   3) increases by a factor of 1.25
   4) decreases by a factor of 1.25

3. The magnetic moment has dimensions of :

   1) $[L^{-1} A]$
   2) $[L^2A]$
   3) $[L^2T^{-1}A]$
   4) $[L^3T^{-1}A]$

4. A bimetallic strip consists of metals X and Y. It is mounted rigidly at the base as shown. The metal X has a higher coefficient of expansion compared to that for metal Y. When bimetallic strip is placed in a cold bath :



   1) it will bend towards the right
   2) it will bend towards the left
   3) it will not bend but shrink
   4) it will neither bend nor shrink

5. When you make ice cubes, the entropy of water :

1) does not change
2) increases
3) decreases
4) may either increase or decrease depending on the process used

6. The circuit given below represents which of the logic operations?

1) AND 2) NOT 3) OR 4) NOR

7. Three objects coloured black, gray and white can withstand hostile conditions upto 2800°C. These objects are thrown into a furnace where each of them attains a temperature of 2000°C. Which object will glow brightest?
   1) The white object
   2) The black object
   3) All glow with equal brightness
   4) Gray object

8. Two spheres of same size, one of mass 2 kg and another of mass 4 kg, are dropped simultaneously from the top of Qutab Minar (height = 72 m). When they are 1 m above the ground, the two spheres have the same :
   1) momentum
   2) kinetic energy
   3) potential energy
   4) acceleration

9. Two tuning forks P and Q when set vibrating, give 4 beats/s. If a prong of the fork P is filed, the beats are reduced to 2 /s. What is Frequency of P, if that of Q is 250 Hz ?
   1) 246 Hz
   2) 248 Hz
   3) 260 Hz
   4) 262 Hz

10. The minimum potential difference between the base and emitter required to switch a silicon transistor 'ON' is approximately :
    1) 1 V 2) 2 V 3) 7 V 4) 9 V

11. The voltage of clouds is 4×10^6 V with respect to ground. In a lightning strike lasting 100 ms, a charge of 4 C is delivered to the ground. The power of lightning strike is :
    1) 160 MW
    2) 180 MW
    3) 200 MW
    4) 400 kW

12. The moment of inertia of a rod about an axis through its centre and perpendicular to it is (1/12) ML^2 (where M is the mass and L, the length of the rod). The rod is bent in the middle so that the two halves make an angle of 60°. The moment of inertia of the bent rod about the same axis would be :

1) $1/36\ ML^2$
2) $1/24\ ML^2$
3) $1/12\ ML^2$
4) $ML^2/8\sqrt{2}$

13. An amplifier has a voltage gain $A_v = 1000$. The voltage gain in dB is :

1) 30 dB
2) 60 dB
3) 90 dB
4) 120 dB

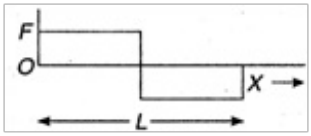
14. In refraction, light waves are bent on passing from one medium to the second medium, because, in the second medium :

1) the frequency is different
2) the coefficient of elasticity is different
3) the speed is different
4) the amplitude is smaller

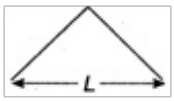
15. Two parallel large thin metal sheets have equal surface charge densities ($\sigma = 26.4 \times 10^{-12}$ C/m^2) of opposite signs. The electric field between these sheets is :

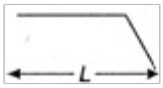
1) 1.2 N/C
2) 1.2×10^{-10} N/C
3) 3 N/C
4) 3×10^{-10} N/C

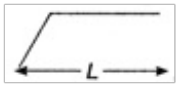
16. A person used force (F), shown in figure to move a load with constant velocity on given surface.

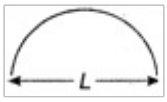


Identify the correct surface profile :

1) 

2) 

3) 

4) 

17. A point source emits sound equally in all directions in a non-absorbing medium. Two points P and Q are at distance of 2 m and 3 m respectively from the source. The ratio of the intensities of the waves at P and Q is :

    1) 9 : 4
    2) 81 : 16
    3) 16 : 81
    4) 4 : 9

18. A leaf which contains only green pigments, is illuminated by a laser light of wavelength 0.6328 μm. It would appear to be :

    1) Brown
    2) Black
    3) Red
    4) Green

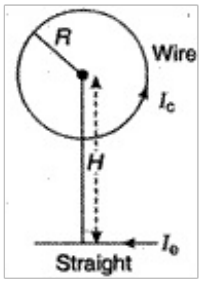
19. A boat at anchor is rocked by waves whose crests are 100 m apart and velocity is 25 m/s. The boat bounces up once in every :

    1) 2400 s
    2) 25 s
    3) 4 s
    4) 0.4 s

20. A light emitting diode (LED) has a voltage drop of 2 V across it and passes a current of 10 mA. When it operates with a 6 V battery through a limiting resistor R. The value of R is :

    1) 100 Ω
    2) 200 Ω
    3) 300 Ω
    4) 400 Ω

21. Circular loop of a wire and a long straight wire carry currents I_c and I_e, respectively as shown in figure. Assuming that these are placed in the same plane. The magnetic field will be zero at the centre of the loop when the separation H is :



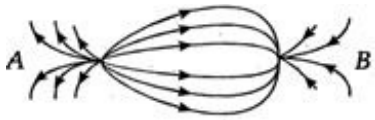
1) $(I_eR)/(I_c\pi)$
2) $(I_cR)/(I_e\pi)$
3) $(\pi I_c)/(I_eR)$
4) $(I_e\pi)/(I_cR)$

22. When a *p-n* junction diode is reverse biased, then :
1) no current flows
2) the depletion region is increased
3) the depletion region is reduced
4) the height of the potential barrier is reduced

23. The operation of a number reactor is said to be critical, if the multiplication factor (k) has a value :
1) 1
2) 1.2
3) 2.5
4) 3.2

24. $^{238}U_{92}$ has 92 protons and 238 nucleons. It decays by emitting an alpha particle and becomes :
1) $^{234}U_{92}$
2) $^{234}Th_{90}$
3) $^{235}U_{92}$
4) $^{237}Np_{93}$

25. The spatial distribution of the electric field due to charges (A, B) is shown in figure. Which one of the following statements is correct?

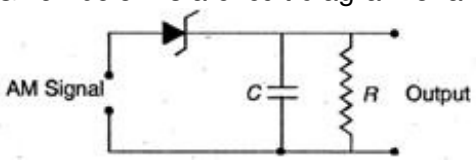


1) A is +ve and B –ve and |A| > |B|
2) A is -ve and B +ve; |A| = |B|
3) Both are +ve but A > B
4) Both are –ve but A > B

26. By sucking through a straw, a student can reduce the pressure in his lungs to 750 mm of Hg (density = 13.6 g/cm^3). Using the straw, he can drink water from a glass upto a maximum depth of :

1) 12.6 cm
2) 1.26 cm
3) 13.6 cm
4) 1.36 cm

27. Given below is a circuit diagram of an AM demodulator.



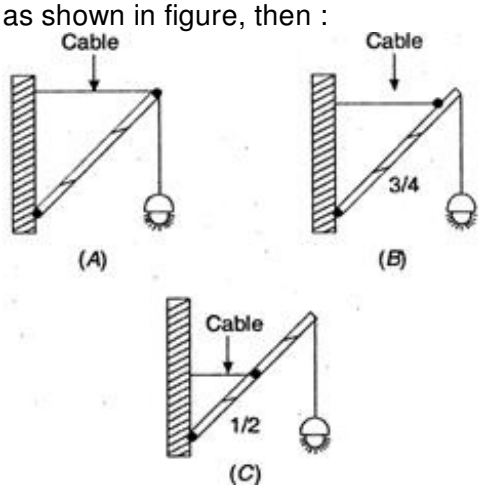
For good demodulation of AM signal of carrier frequency *f*, the value of RC should be :

1) RC = 1/*f*
2) RC < 1/*f*
3) RC ≥ 1/*f*
4) RC >> 1/*f*

28. Hard X-rays for the study of fractures in bones should have a minimum wavelength of 10^{-11} m. The accelerating voltage for electrons in X-ray machine should be :

1) < 124 kV
2) > 124 kV
3) between 40 kV and 60 kV
4) = 10 kV

29. If a street light of mass M is suspended from the end of a uniform rod of length L in different possible patterns as shown in figure, then :



1) pattern A is more sturdy
2) pattern B is more sturdy
3) pattern C is more sturdy
4) all will have same sturdiness

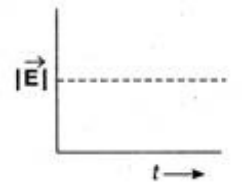
30. The fossil bone has a ^{14}C : ^{12}C ratio, which is [1/16] of that in a living animal bone. If the half-life of ^{14}C is 5730 years, then the age of the fossil bone is :

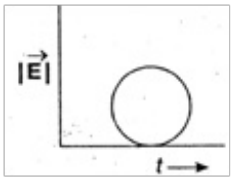
1) 12460 years
2) 15190 years
3) 22920 years
4) 25840 years

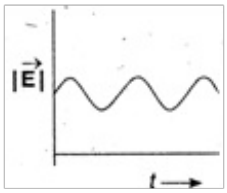
31. Flash light equipped with a new set of batteries, produces bright white light. As the batteries wear out :

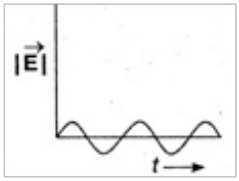
1) the light intensity gets reduced with no change in its colour
2) light colour changes first to yellow and then red with no change in intensity
3) it stops working suddenly while giving white light
4) colour changes to red and also intensity gets reduced

32. Which of the following diagrams represent the variation of electric field vector with time for a circularly polarised light?

1) 

2) 

3) 

4) 

33. For inelastic collision between two spherical rigid bodies :

1) the total kinetic energy is conserved
2) the total mechanical energy is not conserved
3) the linear momentum is not conserved
4) the linear momentum is conserved

34. In photoelectric effect, the electrons are ejected from metals if the incident light has a certain minimum :

1) wavelength
2) frequency
3) amplitude
4) angle of incidence

35. For a wave propagating in a medium, identify the property that is independent of the others?

1) Velocity
2) Wavelength
3) Frequency
4) All these depend on each other

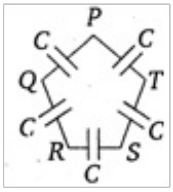
36. Which one of the following is a possible nuclear reaction?

1) $^{10}B_5 + {}^4He_2 \rightarrow {}^{13}N_7 + {}^1H_1$
2) $^{23}Na_{11} + {}^1H_1 \rightarrow {}^{20}Ne_{10} + {}^4He_2$
3) $^{239}Np_{93} \rightarrow {}^{239}Pu_{94} + \beta^- + v^-$
4) $^{11}N_7 + {}^1H_1 \rightarrow {}^{12}C_6 + \beta^- + v$

37. Two balloons are filled, one with pure He gas and the other by air, respectively. If the pressure and temperature of these balloons are same then the number of molecules per unit volume is :

1) more in the He filled balloon
2) same in both balloons
3) more in air filled balloon
4) in the ratio of 1 : 4

38. Five capacitors, each of capacitance value C are connected as shown in the figure. The ratio of capacitance between P and R, and the capacitance between P and Q, is :

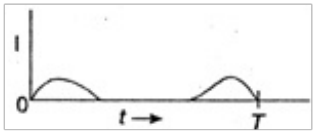


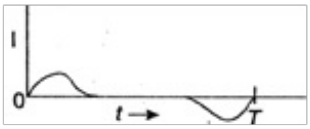
1) 1 : 3
2) 1 : 2
3) 2 : 3
4) 3 : 5

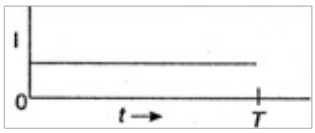
39. If alpha, beta and gamma rays carry same momentum, which has the longest wavelength?

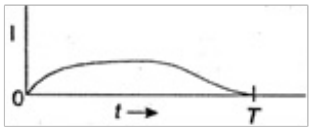
1) Alpha rays
2) Beta rays
3) Gamma rays
4) None, all have same wavelength

40. A metallic ring is dropped down, keeping its plane perpendicular to a constant and horizontal magnetic field. The ring enters the region of magnetic field at $t = 0$ and completely emerges out at $t = T$ s. The current in the ring varies as :

1) 

2) 

3) 

4) 

Directions for question 41 to 60 :
In each of the following questions a statement of Assertion is given followed by a corresponding statement of Reason just below it. Of the statements mark the correct answer as :

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

41. **Assertion :** Electromagnetic waves with frequencies more than the critical frequency of ionosphere cannot be used for communication using sky wave propagation.
Reason : The refractive index of the ionosphere becomes very high for frequencies higher than the critical frequency.

1) (a) 2) (b) 3) (c) 4) (d)

42. **Assertion :** The binding energy per nucleon, for nuclei with atomic mass number A > 100, decreases with A.
Reason : The nuclear forces are weak for heavier nuclei.

1) (a) 2) (b) 3) (c) 4) (d)

43. **Assertion :** In common base configuration, the current gain of the transistor is less than

unity.
Reason : The collector terminal is reverse biased for amplification.

1) (a) 2) (b) 3) (c) 4) (d)

44. **Assertion :** In an isolated system the entropy increases.
Reason : The processes in an isolated system are adiabatic.

1) (a) 2) (b) 3) (c) 4) (d)

45. **Assertion :** Magnetic resonance imaging (MRI) is a useful diagnostic tool for producing images of various parts of human body.
Reason : Protons of various tissues of the human body play a role in MRI.

1) (a) 2) (b) 3) (c) 4) (d)

46. **Assertion :** A judo fighter in order to throw his opponent on to the mat tries to initially bend his opponent and then rotate him around his hip.
Reason : As the mass of the opponent is brought closer to the fighter's hip, the force required to throw the opponent is reduced.

1) (a) 2) (b) 3) (c) 4) (d)

47. **Assertion :** The root mean square and most probable speeds of the molecules in a gas are the same.
Reason : The Maxwell distribution for the speed of molecules in a gas is symmetrical.

1) (a) 2) (b) 3) (c) 4) (d)

48. **Assertion :** Use of ball bearings between two moving parts of machine is a common practice.
Reason : Ball bearings reduce vibrations and provide good stability.

1) (a) 2) (b) 3) (c) 4) (d)

49. **Assertion :** Standard optical diffraction can not be used for discriminating between different X-ray wavelengths.
Reason : The grating spacing is not of the order of X-ray wavelengths.

1) (a) 2) (b) 3) (c) 4) (d)

50. **Assertion :** Diamagnetic materials can exhibit magnetism.
Reason : Diamagnetic materials have permanent magnetic dipole moment.

1) (a) 2) (b) 3) (c) 4) (d)

51. **Assertion :** A man in a closed cabin falling freely does not experience gravity.
Reason : Inertial and gravitational mass have equivalence.

1) (a) 2) (b) 3) (c) 4) (d)

52. **Assertion :** Photoelectric emission is an instantaneous process.
Reason : There is no time lag between incidence of light and emission of photoelectron.

1) (a) 2) (b) 3) (c) 4) (d)

53. **Assertion :** The Carnot cycle is useful in understanding the performance of heat engines.
Reason : The Carnot cycle provides a way of determining the maximum possible efficiency achievable with reservoirs of given temperatures.
1) (a) 2) (b) 3) (c) 4) (d)

54. **Assertion :** A *p-n* junction with reverse bias can be used as a photo-diode to measure light intensity.
Reason : In a reverse bias condition the current is small but it is more sensitive to change in incident light intensity.
1) (a) 2) (b) 3) (c) 4) (d)

55. **Assertion :** Perspiration from human body helps in cooling the body.
Reason : A thin layer of water on the skin enhances its emissivity.
1) (a) 2) (b) 3) (c) 4) (d)

56. **Assertion :** In adiabatic compression the internal energy and temperature of the system get decreased.
Reason : The adiabatic compression is a slow process.
1) (a) 2) (b) 3) (c) 4) (d)

57. **Assertion :** Cobalt-60 is useful in cancer therapy.
Reason : Cobalt-60 is source of γ-radiations capable of killing cancerous cell.
1) (a) 2) (b) 3) (c) 4) (d)

58. **Assertion :** A thin stainless steel needle can lay floating on a still water surface.
Reason : Any object floats when the buoyancy force balances the weight of the object.
1) (a) 2) (b) 3) (c) 4) (d)

59. **Assertion :** In the phenomenon of mutual induction, self-induction of each of the coil persists.
Reason : Self-induction arises when strength of current in one coil changes. In mutual induction current is changing in both the individual coils.
1) (a) 2) (b) 3) (c) 4) (d)

60. **Assertion :** In optical fibre, the diameter of the core is kept small.
Reason : This smaller diameter of the core ensures that the fibre should have incident angle more than the critical angle required for total internal reflection.
1) (a) 2) (b) 3) (c) 4) (d)

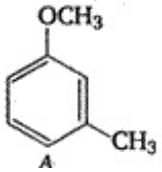
Chemistry

61. Tincture of iodine is:

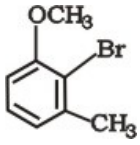
1) aqueous solution of I_2
2) solution of I_2 in aqueous KI
3) alcoholic solution of I_2
4) aqueous solution of KI

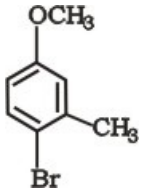
62. Given below, catalyst and corresponding process/reaction are matched. The mismatch is:
1) $[RhCl(PPh_3)_2]$: Hydrogenation
2) $TiCl_4 + Al(C_2H_5)_3$: Polymerization
3) V_2O_5 : Haber-Bosch process
4) Nickel : Hydrogenation

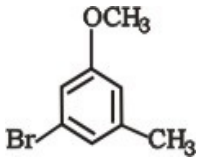
63. The major product obtained on the monobromination (with Br_2 / $FeBr_3$) of the following compound A is:

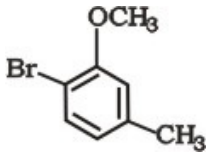


A

1) 

2) 

3) 

4) 

64. 40 mL of 0.1 M ammonia solution is mixed with 20 mL of 0.1 M HCl. What is the pH of the mixtrue? (pK_b of ammonia solution is 4.74) :
1) 2.74
2) 7.26
3) 9.26
4) 10.26

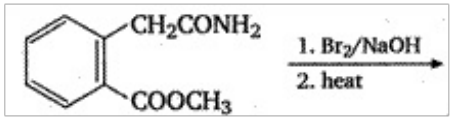
65. The colour imparted by Co(II) compounds to glass is:

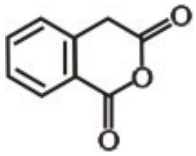
1) green
2) deep-blue
3) yellow
4) red

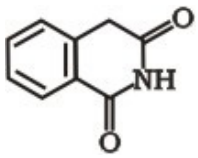
66. The pair whose both species are used in antiacid medicinal preparations is:

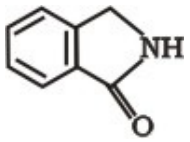
1) $NaHCO_3$ and $Mg(OH)_2$
2) Na_2CO_3 and $Ca(HCO_3)_2$
3) $Ca(HCO_3)_2$ and $Mg(OH)_2$
4) $Ca(OH)_2$ and $NaHCO_3$

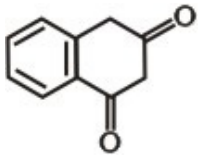
67. The following sequence of reactions of A gives:



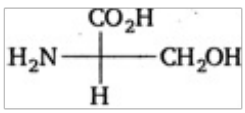
1) 

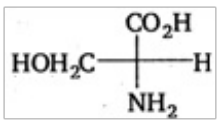
2) 

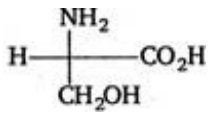
3) 

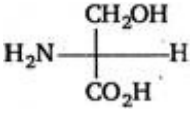
4) 

68. Among the following L-serine is :

1) 

2) 

3) 

4) 

69. The number of possible isomers of an octahedral complex $[Co(C_2O_4)_2(NH_3)_2]^-$ is:

1) 9 2) 5 3) 3 4) 7

70. A 5% solution (by mass) of cane sugar in water has freezing point of 271 K and freezing point of pure water is 273.15 K. The freezing point of a 5% solution (by mass) of glucose in water is:

1) 271.05 K
2) 273.15 K
3) 269.07 K
4) 278.23 K

71. The products formed when an aqueous solution of NaBr is electrolyzed in a cell having inert electrodes are:

1) Na and Br_2
2) Na and O_2
3) H_2, Br_2 and NaOH
4) H_2 and O_2

72. The de-Broglie wavelength associated with a ball of mass 1 kg having kinetic energy 0.5 J is :

1) 6.626×10^{-34} m
2) 15.20×10^{-34} m
3) 20.38×10^{-21} m
4) 8.626×10^{-34} Å

73. Borax is used as cleansing because on dissolving in water it gives:

1) alkaline solution
2) acidic solution
3) bleaching solution
4) colloidal solution

74. The pair in which both species have same magnetic moment (spin only value) is:

1) $[Cr(H_2O)_6]^{2+}$, $[CoCl_4]^{2-}$
2) $[Cr(H_2O)_6]^{2+}$, $[Fe(H_2O)_6]^{2+}$
3) $[Mn(H_2O)_6]^{2+}$, $[Cr(H_2O)_6]^{2+}$
4) $[CoCl_4]^{2-}$, $[Fe(H_2O)_6]^{2+}$

75. Among the following, the species having square planar geometry for central atom are:
(i) XeF_4

(ii) SF_4

(iii) $[NiCl_4]^{2-}$

(iv) $[PtCl_4]^{2-}$

1) (i) and (iv)
2) (i) and (ii)
3) (ii) and (iii)
4) (iii) and (iv)

76. Methyl-α-D-glucoside and methyl-β-D-glucoside are:

1) epimers
2) anomers
3) enantiomers
4) conformational diastereomers

77. The correct increasing order of the reactivity of halides for S_N 1 reaction is:

1) $CH_3 — CH_2 — X < (CH_3)_2CH — X < CH_2 = CH — CH_2 — X < PhCH_2 — X$
2) $(CH_3)_2CH — X < CH_3 — CH_2 — X < CH_2 = CH — CH_2X < PhCH_2 — X$
3) $PhCH_2 — X < (CH_3)_2CH — X < CH_3 — CH_2 — X < CH_2 = CH — CH_2 — X$
4) $CH_2 = CH — CH_2 — X < Ph — CH_2 — X < (CH_3)_2CH — X < CH_3 — CH_2 — X$

78. Which of the following sequence of reactions (reagents) can be used for the conversion of $C_6H_5CH_2CH_3$ into $C_6H_5CH = CH_2$?

1) $SOCl_2$; H_2O
2) SO_2Cl_2; alc. KOH
3) Cl_2/hv; H_2O
4) $SOCl_2$; alc. KOH

79. The compound molecular in nature in gas phase but ionic in solid state is:

1) PCl_5
2) CCl_4
3) PCl_3
4) $POCl_3$

80. The incorrect statement among the following is:

1) C_{60} is an allotropic form of carbon
2) O_3 is an allotropic form of oxygen
3) S_8 is only allotropic form of sulphur
4) red phosphorus is more stable in air than white phosphorus

81. The pair in which both species have iron is:

1) nitrogenase, cytochromes
2) carboxypeptidase, haemoglobin
3) haemocyanin, nitorogenase
4) haemoglobin, cytochromes

82. The ligands in anti-cancer drug *cis*-platin are:

1) NH_3, Cl
2) NH_3, H_2O
3) Cl, H_2O
4) NO, Cl

83. Which of the following compounds has the highest boiling point?

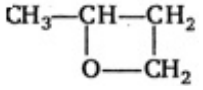
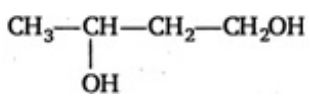
1) $CH_3CH_2CH_2Cl$
2) $CH_3CH_2CH_2CH_2Cl$
3) $CH_3CH(CH_3)CH_2Cl$
4) $(CH_3)_3CCl$

84. The compound used in enrichment of uranium for nuclear power plant is:

1) U_3O_8
2) UF_6
3) $UO_2(NO_3)_2$
4) UCl_4

85. The major product formed in the followin reaction.

$CH_3CH(Cl)CH_2—CH_2OH \xrightarrow{Aq.\ KOH}$ is

1) $CH_3CH = CH—CH_2OH$
2) $CH_2 = CH—CH_2—CH_2OH$
3) 
4) 

86. In $[Ag(CN)_2]^{2-}$, the number of π bonds is:

1) 1 2) 2 3) 4 4) 8

87. The Ca^{2+} and F^- are located in CaF_2 crystal, respectively at body centered cubic lattice points and in:

1) tetrahedral voids

2) half of tetrahedral voids
3) octahedral voids
4) half of octahedral voids

88. Which two of the following salts are used for preparing iodized salt?
(i) KIO_3
(ii) KI
(iii) I_2
(iv) HI
1) (i) and (ii)
2) (i) and (iii)
3) (ii) and (iv)
4) (iii) and (iv)

89. Nitrobenzene on treatment with zinc dust and aqueous ammonium chloride gives:
1) $C_6H_5N = N—CH_3$
2) $C_6H_5NH_2$
3) C_6H_5NO
4) C_6H_5NHOH

90. Thymine is:
1) 5-methyluracil
2) 3-methyluracil
3) 2-methyluracil
4) 1-methyluracil

91. The enthalpy change (ΔH) for the reaction, $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$ is -92.38 kJ at 298 K. The internal energy change ΔU at 298 K is:
1) -90.38 kJ
2) -87.42 kJ
3) - 95.34 kJ
4) - 98.9 kJ

92. For the reaction $2N_2O_5 \rightarrow 4NO_2 + O_2$ rate of reaction is:
1) (d/dt) $[N_2O_5]$
2) 2 (d/dt) $[N_2O_5]$
3) (1/4) (d/dt) $[NO_2]$
4) 3 (d/dt) $[NO_2]$

93. Among the following which one can have a meso form?
1) $CH_3CH(OH)CH(Cl)C_2H_5$

2) $CH_3CH(OH)CH(OH)CH_3$

3) $C_2H_5CH(OH)CH(OH)CH_3$

4) $HOCH_2CH(Cl)CH_3$

94. Lysine is least soluble in water in the pH range:

1) 2 to 3

2) 4 to 5

3) 6 to 7

4) 8 to 9

95. For a spontaneous process the correct statement is:

1) Entropy of the system always increases

2) Free energy of the system always increases

3) Total entropy change is always negative

4) Total entropy change is always positive

96. Dominance of strong repulsive forces among the molecules of the gas (Z = compressibility factor) :

1) depends on Z and indicated by Z = 1

2) depends on Z and indicated by Z > 1

3) depends on Z and indicated by Z < 1

4) is independent of Z

97. Isopropylbenzene on air oxidation in the presence of dilute acid gives:

1) $C_6H_5COOCH_3$

2) $C_6H_5COCH_3$

3) C_6H_5CHO

4) C_6H_5OH

98. The charge required for the reduction of l mol of MnO^-_4 to MnO_2 is:

1) 2 F 2) 3 F 3) 4 F 4) 5 F

99. The energy gaps (E_g) between valence band and conduction band for diamond, silicon and germanium are in the order.

1) E_g (diamond) > E_g (silicon) > E_g (germanium)

2) E_g (diamond) < E_g (silicon) < E_g (germanium)

3) E_g (diamond) = E_g (silicon) = E_g (germanium)

4) E_g (diamond) > E_g (germanium) > E_g (silicon)

100. Fora phase change $H_2O(l) \underset{0\ C,\ 1bar}{\rightleftharpoons} H_2O(s)$

1) $\Delta G = 0$

2) $\Delta S = 0$

3) $\Delta H = 0$

4) $\Delta U = 0$

Directions for question 101 to 120 :

In each of the following questions a statement of Assertion is given followed by a corresponding statement of Reason just below it. Of the statements mark the correct answer as :

(a) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(b) If both assertion and reason are true but the reason is not the correct explanation of the assertion.

(c) If assertion is true statement but reason is false.

(d) If both assertion and reason are false.

101. **Assertion :** In the iodometric titration starch is used as an indicator.
Reason : Starch is a polysaccharide.

1) (a) 2) (b) 3) (c) 4) (d)

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

1) (a) 2) (b) 3) (c) 4) (d)

103. **Assertion :** $[Co(NO_2)_3(NH_3)_3]$ does not show optical isomerism.
Reason : It has a plane of symmetry.

1) (a) 2) (b) 3) (c) 4) (d)

104. **Assertion :** E° for Mn^{3+}/Mn^{2+} is more positive than Cr^{3+}/Cr^{2+}.
Reason : The third ionization energy of Mn is larger than that of Cr.

1) (a) 2) (b) 3) (c) 4) (d)

105. **Assertion :** $K_2Cr_2O_7$ is used as a primary standard in volumetric analysis.
Reason : It has a good solubility in water.

1) (a) 2) (b) 3) (c) 4) (d)

106. **Assertion :** Silicones are hydrophobic in nature.
Reason : Si—O—Si linkages are moisture sensitive.

1) (a) 2) (b) 3) (c) 4) (d)

107. **Assertion :** According to transition state theory, for the formation of an activated complex, one of the vibrational degree of freedom is converted into a translational degree of freedom.
Reason : Energy of the activated complex is higher than the energy of reactant molecules.

1) (a) 2) (b) 3) (c) 4) (d)

108. **Assertion :** Water in liquid state is more stable than ice at room temperature.
Reason : Water in liquid form has higher entropy than ice.

1) (a) 2) (b) 3) (c) 4) (d)

109. **Assertion :** Sb_2S_3 is **not** soluble in yellow ammonium sulphide.
Reason : The common ion effect due to S^{2-} ions reduces the solubility of Sb_2S_3.

1) (a) 2) (b) 3) (c) 4) (d)

110. **Assertion :** Graphite is an example of tetragonal crystal system.
Reason : For a tetragonal system, $a = b \neq c$, $\alpha = \beta = 90°$, $\gamma = 120°$

1) (a) 2) (b) 3) (c) 4) (d)

111. **Assertion :** For the Daniel cell $Zn|Zn^{2+} || Cu^{2+} | Cu$ with $E_{cell} = 1.1$ V, the application of opposite potential greater than 1.1 V results into flow of electron from cathode to anode.
Reason : Zn is deposited at anode and Cu is deposited at cathode.

1) (a) 2) (b) 3) (c) 4) (d)

112. **Assertion :** Fe^{3+} can be used for coagulation of As_2S_3 sol.
Reason : Fe^{3+} reacts with As_2S_3 to give Fe_2S_3.

1) (a) 2) (b) 3) (c) 4) (d)

113. **Assertion :** If red blood cells were removed from the body and placed in pure water, pressure inside the cells increases.
Reason : The concentration of salt content in the cells increases.

1) (a) 2) (b) 3) (c) 4) (d)

114. **Assertion :** Change in colour of acidic solution of potassium dichromate by breath is used to test drunk drivers.
Reason : Change in colour is due to the complexation of alcohol with potassium dichromate.

1) (a) 2) (b) 3) (c) 4) (d)

115. **Assertion :** Anilinium chloride is more acidic than ammonium chloride.
Reason : Anilinium ion is resonance-stabilized.

1) (a) 2) (b) 3) (c) 4) (d)

116. **Assertion :** Diastereoisomers have different physical properties.
Reason : They are non-superimposable mirror images.

1) (a) 2) (b) 3) (c) 4) (d)

117. **Assertion :** The presence of nitro group facilitates nucleophilic substitution reactions in aryl halides.
Reason : The intermediate carbanion is stabilized due to the presence of nitro group.

1) (a) 2) (b) 3) (c) 4) (d)

118. **Assertion :** 1, 3-butadiene is the monomer for natural rubber.
Reason : Natural rubber is formed through anionic addition polymerization.

1) (a) 2) (b) 3) (c) 4) (d)

119. **Assertion** : Addition of HBr on 2-butene gives two isomeric products.
Reason : Addition of HBr on 2-butene follows Markownikoff's rule.

1) (a) 2) (b) 3) (c) 4) (d)

120. **Assertion :** The water pouch of instant cold pack for treating athletic injuries breaks when squeezed and NH_4NO_3 dissolves lowering the temperature.
Reason : Addition of non-volatile solute into solvent result into depression of freezing point of the solvent.

1) (a) 2) (b) 3) (c) 4) (d)

Biology

121. The Montreal protocol refers to :

1) persistent organic pollutants
2) global warming and climate change
3) substances that deplete the ozone layer
4) biosafety of genetically modified organisms

122. Keystone species deserve protection because these :

1) are capable of surviving in harsh environmental conditions
2) indicate presence of certain minerals in the soil
3) have become rare due to over exploitation
4) play an important role in supporting other species

123. Both corpus luteum and macula lutea are :

1) found in human ovaries
2) a source of hormones
3) characterised by a yellow colour
4) contributory in maintaining pregnancy

124. In India, we find mangoes with different flavours, colours, fibre content, sugar content and even shelf life. The large variation is on account of :

1) species diversity
2) induced mutations

3) genetic diversity
4) hybridization

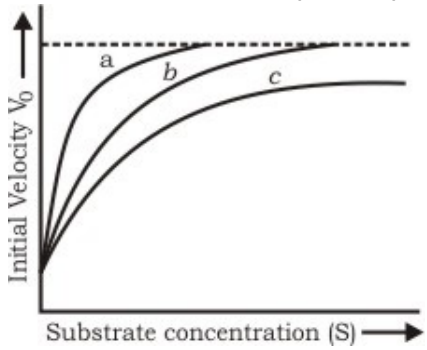
125. Myxomycetes are :
1) saprobes or parasites, having mycelia, asexual reproduction by fragmentation, sexual reproduction by fusion of gametes
2) slimy mass of multinucleate protoplasm, having pseudopodia like structures for engulfing food, reproduction through fragmentation or zoospores
3) prokaryotic organisms, cellular or acellular, saprobes or autotrophic reproduce by binary fission
4) eukaryotic, single-celled or filamentous, saprobes or autotrophic, asexual reproduction by division of haploid individuals, sexual reproduction by fusion of two cells or their nuclei

126. During protein synthesis in an organism, at one point the process comes to a halt. Select the group of the three codons from the following, from which any one of the three could bring about this halt ?
1) UUU, UCC, UAU
2) UUC, UUA, UAC
3) UAG, UGA, UAA
4) UUG, UCA, UCG

127. Avena curvature test is a bioassay for examining the activity of :
1) auxins
2) gibberellins
3) cytokinins
4) ethylene

128. "Ordines Anomali" of Bentham and Hooker includes :
1) seed plants showing abnormal forms of growth and development
2) plants represented only in fossil state
3) plants described in the literature but which Bentham and Hooker did not see in original
4) a few orders which could not be placed satisfactorily in the classification

129. The figure given below shows three velocity-substrate concentration curves for an enzyme reaction. What do the curves *a, b* and *c* depict respectively?



1) a-normal enzyme reaction, b-competitive inhibition, c-non-competitive inhibition
2) a-enzyme with an allosteric modulator added, b-normal enzyme activity, c-competitive inhibition
3) a-enzyme with an allosteric stimulator, b-competitive inhibitor added, c-normal enzyme reaction
4) a-normal enzyme reaction, b-non-competitive inhibitor added, c-allosteric inhibitor added

130. All mammals without any exception are characterised by :
1) viviparity and biconcave red blood cells
2) extra-abdominal testes and a four-chambered heart
3) heterodont teeth and 12 pairs of cranial nerves
4) a muscular diaphragm and milk producing glands

131. Somaclonal variation is seen in :
1) tissue culture grown plants
2) apomicts
3) polyploids
4) vegetatively propagated plants

132. Among rust, smut and mushroom all the three :
1) are pathogens
2) are saprobes
3) bear ascocarps
4) bear basidiocarps

133. In prokaryotes, chromatophores are :
1) specialized granules responsible for colouration of cells
2) structures responsible for organizing the shape of the organism
3) incusion bodies lying free inside the cells for carrying out various metabolic activities
4) internal membrane systems that may become extensive and complex in photosynthetic bacteria

134. A scion is grafted to a stock. The quality of fruits produced will be determined by the genotype of :
1) stock
2) scion
3) both stock and scion
4) neither stock nor scion

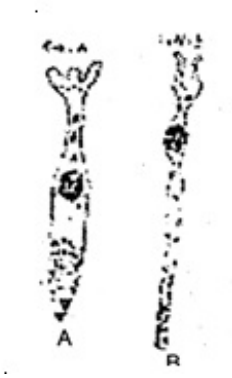
135. In which one of the following sets of three items each belong to the category mentioned against them ?
1) Lysine, glycine, thiamine — Amino acids

2) Myosin, oxytocin and gastric — Hormones

3) Rennin, helicase and hyaluronidase — Enzymes

4) Optic nerve, occulomotor, vagus — Sensory nerves

136. Examine the diagram of the two cell types A and B given below and select the correct option :



1) cell A is the rod cell found evenly all over retina

2) cell A is the cone cell more concentrated in the fovea centralis

3) cell B is concerned with colour vision in bright light

4) cell A is sensitive to low light intensities

137. A normal woman whose father was colourblind, is married to a normal man. The sons would be :

1) 75% colourblind

2) 50% colourblind

3) all normal

4) all colourblind

138. Pollution from animal excreta and organic waste from kitchen can be most profitably minimized by :

1) stroring them in udergrround storage tanks

2) using them for producing biogas

3) vermiculture

4) using them directly as biofertilizers

139. Grafting is successful in dicots but not in monocots because the dicots have :

1) vascular bundles arranged in a ring

2) cambium for secondary growth

3) vessels with elements arranged end to end

4) cork cambium

140. Plants of which one of the following groups of genera are pollinated by the same agency ?

1) Triticum, Mussanda, Zea mays

2) Kadam, Cannabis
3) Salvia, Calotropis
4) Salvia, Pinta, Ophrys

141. Which one of the following precedes re-formation of the nuclear envelope during M phase of the cell cycle?
1) Decondensation from chromosomes and reassembly of the nuclear lamina
2) Transcription from chromosomes and reassembly of the nuclear lamina
3) Formation of the contractile ring and formation of the phragmoplast
4) Formation of the contractile ring and transcription from chromosomes

142. A lizard-like member of reptilia is sitting on a tree with its tail coiled around a twig. This animal could be :
1) *Hemidactylus* showing sexual dimorphism
2) *Varanus* showing mimicry
3) Garden lizard (*Calotes*) showing camouflage
4) *Chamaeleon* showing protective colouration

143. Which one of the following pairs of the kind of cells and their secretion of correctly matched?
1) Oxyntic cells—A secretion with pH between 2.0 and 3.0
2) Alpha cells of Islet's of Langerhans—Secretion that decreases blood sugar level
3) Kupfer cells—A digestive enzyme that hydrolyses nucleic acids
4) sebaceous glands—A secretion that evaporates for cooling

144. Viruses that infect bacteria multiply and cause their lysis, are called :
1) lysozymes
2) lipolytic
3) lytic
4) lysogenic

145. In the following table identify the correct matching of the crop(C), its disease(D) and the corresponding pathogen(P):
1) C => Citrus, D=> Canker, P => Pseudomonas rubrilineans
2) C => Potato, D => Late blight, P => Fusarium udum
3) C => Brinjal, D => Root-knot, P => Meloidogyne incognita
4) C => Pigeon pea, D => Seed gall, P => Phytophthora infestans

146. In which one of the following combinations (1 – 4) of the number of the chromosomes is the present day hexaploid wheat correctly represented?
1) Monosomic => 21 Haploid => 28 Nullisomic => 42 Trisomic => 43
2) Monosomic => 7 Haploid => 28 Nullisomic => 40 Trisomic => 42
3) Monosomic => 21 Haploid => 7 Nullisomic => 42 Trisomic => 43

4) Monosomic => 41 Haploid => 21 Nullisomic => 40 Trisomic => 43

147. Biosophere reserves differ from National Parks and Wildlife Sancturies because in the former :
1) human beings are not allowed to enter
2) people are an integral part of the system
3) plants are paid greater attention than the animals
4) living organisms are brought from all over the world and preserved for posterity

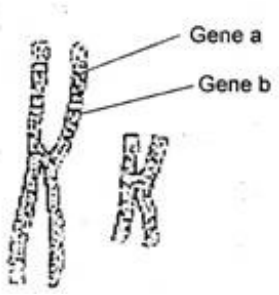
148. Mating of an organism to a double recessive in order to determine whether it is homozygous or heterozygous for a character under consideration is called :
1) reciprocal cross
2) test cross
3) dihybrid cross
4) back cross

149. Which one of the following pairs is correctly matched?
1) Rhizobium — Parasite in the roots of leguminous plants
2) Mycorrhizae — Mineral uptake from soil
3) Yeast — Production of biogas
4) Myxomycetes — The disease ringworm

150. The type of epithelial cells which line the inner surface of fallopian tubes, bronchioles and small bronchi, are known as :
1) squamous epithelium
2) columnar epithelium
3) cilated epithelium
4) cubical epithelium

151. In the sieve elements, which one of the following is the most likely function of P-proteins?
1) Deposition of callose on sieve plates
2) Providing energy for active translocation
3) Autolytic enzymes
4) Sealing mechanism on wounding

152. Given below is a highly simplified representation of the human sex chromosomes from a karyotype. The genes a & b could be of :



1) colour blindness and body height
2) attached ear lobe and rhesus blood group
3) haemophilia and red-green colour blindness
4) phenylketonuria and haemophilia

153. The function of leghaemoglobin during biological nitrogen fixation in root nodules of legumes, is to :
1) convert atmospheric N_2 to NH_3
2) convert ammonia to nitrite
3) transport oxygen for activity of nitrogenase
4) protect nitrogenase from oxygen

154. A cricket player is fast chasing a ball in the field. Which one of the following groups of bones are directly contributing in this movement?
1) Femur, malleus, tibia, metatarsals
2) Pelvis, ulna, patella, tarsals
3) Sternum, femur, tibia, fibula
4) Tarsals, femur, metatarsals, tibia

155. Which one of the following is a matching pair of certain organism (s) and the kind of association?
1) Shark and sucker fish — Commensalism
2) Red algae and fungi in lichens — Mutualism
3) Orchids growing on trees — Parasitism
4) *Cuscuta* (dodder) growing on other-flowering plants-Epiphytism

156. Which one of the following animals(A) is correctly matched with its one characteristic(C) and the taxon(T)?
1) A => Millipede, C => Ventral nerve cord, T => Arachnida
2) A => Duckbilled platypus, C => Oviparous, T => Mammalian
3) A => Silverfish, C => Pectorol and pelvic fins, T => Chordate
4) A => Sea anemone, C=> Triploblastic, T => Cnidaria

157. Which one of the following pairs of features is a good example of polygenic inheritance?
1) Human height and skin colour
2) ABO blood group in humans and flower colour of *Mirabilis jalapa*

3) Hair pigment of mouse and tongue rolling in humans
4) Human eye colour and sickle cell anaemia

158. What is common between chloroplasts, chromoplasts and leucoplasts?
1) Presence of pigments
2) Possession of thylakoids and grana
3) Storage of starch, proteins and lipids
4) Ability to multiply by a fission-like process

159. Given below is a table comparing the effects of sympathetic (S) and parasympathetic (P) nervous system for four features (a - d). Which one feature (F) is correctly described?
1) F => Salivary gland, S => Stimulates secretion, P => Inhibits secretion
2) F => Pupil of the eye, S => Dilate, P => Constricts
3) F => Heart rate, S => Decreases, P => Increases
4) F => Intestinal peristalsis, S => Stimulates, P => Inhibits

160. Genes present in the cytoplasm of eukaryotic cells, are found in :
1) mitochondria and inherited via egg cytoplasm
2) lysosomes and peroxisomes
3) golgi bodies and smooth endoplasmic reticulum
4) plastids and inherited via male gamete

Directions for question 161 to 180 :
In each of the following questions a statement of Assertion is given followed by a corresponding statement of Reason just below it. Of the statements mark the correct answer as :

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

161. **Assertion :** A person who has received a cut and is bleeding needs to be given anti-tetanus treatment.
Reason : Anti-tetanus injection provides immunity by producing antibodies for tetanus.
1) (a) 2) (b) 3) (c) 4) (d)

162. **Assertion :** Cancer cells are virtually immortal until the body in which they resides dies.
Reason : Cancer is caused by damage to genes regulating the cell division cycle.
1) (a) 2) (b) 3) (c) 4) (d)

163. **Assertion :** A network of food chains existing together in an ecosystem is known as a food web.
Reason : An animal like kite cannot be a part of a food web.

1) (a) 2) (b) 3) (c) 4) (d)

164. **Assertion :** In plant tissue culture, somatic embryos can be induced from any plant cell.
Reason : Any viable plant cell can differentiate in to somatic embryos.

1) (a) 2) (b) 3) (c) 4) (d)

165. **Assertion :** The earliest organisms that appeared on the earth were non-green and presumably anaerobes.
Reason : The first autotrophic organisms were the chemo-autotrophs that never released oxygen.

1) (a) 2) (b) 3) (c) 4) (d)

166. **Assertion :** *Escherichia coli, Shigella* sp. and *Salmonella* sp. are all responsible for diarrhoeal diseases.
Reason : Dehydration is common to all types of diarrhoeal diseases and adequate supply of fluids and electrolytes should be ensured.

1) (a) 2) (b) 3) (c) 4) (d)

167. **Assertion :** Deforestation is one main factor contributing to global warming.
Reason : Besides CO_2, two other gases methane and CFCs are also included under green house gases.

1) (a) 2) (b) 3) (c) 4) (d)

168. **Assertion :** LSD and marijuana are clinically used as analgesics.
Reason : Both these drugs suppress brain function.

1) (a) 2) (b) 3) (c) 4) (d)

169. **Assertion :** An organism with lethal mutation may not even develop beyond the zygote stage.
Reason : All types of gene mutations are lethal.

1) (a) 2) (b) 3) (c) 4) (d)

170. **Assertion :** Our body secretes adrenaline in intense cold.
Reason : Adrenaline raises metabolic rate.

1) (a) 2) (b) 3) (c) 4) (d)

171. **Assertion :** In collateral vascular bundles, phloem is situated towards inner side.
Reason : In monocot stem, cambium is present.

1) (a) 2) (b) 3) (c) 4) (d)

172. **Assertion :** In angiosperms, the conduction of water is more efficient because their xylem has vessels.
Reason : Conduction of water by vessel elements is an active process with energy supplied by xylem parenchyma rich in mitochondria.

1) (a) 2) (b) 3) (c) 4) (d)

173. **Assertion :** Polytene chromosomes have a high amount of DNA.
Reason : Polytene chromosomes are formed by repeated replication of chromosomal DNA without separation of chromatids.

1) (a) 2) (b) 3) (c) 4) (d)

174. **Assertion :** UV radiation causes photodissociation of ozone into O_2 and O, thus causing damage to the stratospheric ozone layer.
Reason : Ozone hole is resulting in global warming and climate change.

1) (a) 2) (b) 3) (c) 4) (d)

175. **Assertion :** A concentration of methane in the atmosphere has more than doubled in the last 250 years.
Reason : Wetlands and rice field are the major sources of methane.

1) (a) 2) (b) 3) (c) 4) (d)

176. **Assertion :** In tropical rain forests, O-horizon and A-horizon of soil profile are shallow and nutrient-poor.
Reason : Excessive growth of micro-organisms in the soil depletes its organic content.

1) (a) 2) (b) 3) (c) 4) (d)

177. **Assertion :** Gram-negative bacteria do not retain the stain when washed with alcohol.
Reason : The outer face of the outer membrane of Gram-negative bacteria contains lipopolysaccharides, a part of which is integrated into the membrane lipids.

1) (a) 2) (b) 3) (c) 4) (d)

178. **Assertion :** Under conditions of high light intensity and limited CO_2 supply, photo-respiration has a useful role in protecting the plants from photo-oxidative damage.
Reason : If enough CO_2 is not available to utilize light energy for carboxylation to processed, the excess energy may not cause damage to plants.

1) (a) 2) (b) 3) (c) 4) (d)

179. **Assertion :** Photosynthetically C_4 plants are less efficient than C_3 plants.
Reason : The operation of C_4 pathway requires the involvement of only bundle-sheath cells.

1) (a) 2) (b) 3) (c) 4) (d)

180. **Assertion :** Eukaryotic cells have the ability to adopt a variety of shapes and carry out directed movements.
Reason : There are three principal types of protein filaments-actin filament, microtubules and intermediate filaments, which constitute the cytoskeleton.

1) (a) 2) (b) 3) (c) 4) (d)

181. 'Hindu view of life' is written by :
    1) S. Radhakrishnan
    2) R.K. Narayan
    3) V.D. Savarkar
    4) John Ruskin

182. The National calendar of India is based on :
    1) Gragorian calendar
    2) Hizrr Era
    3) Saka Era
    4) one of the old Indian Era

183. Biometry refers to :
    1) Identification of hymans by scanning face and fingerprints
    2) Measurement of mechanical displacement in humans
    3) A method of lie detection
    4) Body length relationships across the evolutionary scale

184. Ecology deals with :
    1) The earth and planets
    2) The relationship between organisms and environment
    3) The life under the sea
    4) Economical growth of poor people

185. X-rays were discovered by :
    1) Wilhelm K. Roentgen
    2) H. Kissinger
    3) Sir C.V. Raman
    4) Meghnad Saha

186. The gas used in the manufacture of vanaspati ghee is :
    1) Helium
    2) Oxygen
    3) Nitrogen
    4) Hydrogen

187. The jungle in Rudyard Kippling's Jungle book, describes which part of Indian forest ?
    1) Central Indian forest near Satpura range
    2) Ittranchal thick forest
    3) Himalayan Forest in Himachal

4) Nilgiri Jungles

188. Which of the following Indian cricket player after India-Pakistan ODI (one-day International) at Abudhabi became no 1 ODI batsman in the ICC (International Cricket Club) ranking :

1) Saurav ganguly
2) Yuvraj singh
3) Sachin Tendulkar
4) M.S. Dhoni

189. One ream of paper equal to :

1) 120-150 sheets
2) 256 sheets
3) 480-500 sheets
4) 500 sheets

190. Lagoon refers to :

1) A full moon
2) The sea breaking into the land and then separated by sand dunes
3) A spot in a desert made fertile by presence of water
4) Horse shoe shaped coral reef

191. Sardar Sarovar Dam is built on the river :

1) Jhelam
2) Narmada
3) Tapti
4) Vyas

192. Which of the following gases is most toxic ?

1) Carbon dioxide
2) Carbon monoxide
3) Sulpher dioxide
4) None of these

193. Which one of the following literary titles is correctly matched with its author ?

1) Ramayan — Tulsidas
2) Mahabharat — Vedvyas
3) Kumarsambhav — Ravidas
4) Shakuntala — Bhushan

194. Which of the following honour is given by UNESCO?

1) The Kalinga prize

2) Magasay Award
3) Pulitzer Prize
4) Order of the Golden Ark Award

195. India's first battle field missile is :
1) Akash
2) Prithvi
3) Agni
4) Nag

196. Which one of the following is one of the two days when the sun rises exactly in the east?
1) 7th January
2) 21st March
3) 1st June
4) 23rd December

197. 'Body line' in the cricket refers to :
1) Bowling that hits the body
2) The line of body close to Wicket line
3) The white line on ground within which the player stands
4) The line of moving ball

198. A very much publicized treatment method "DOTS" is being adopted for the cure of :
1) Dementia
2) Tetanus
3) Tuberculosis
4) Sexually transmitted disease

199. The supreme command of the defence forces is vested with the :
1) Field Marshal
2) Commander-in-chief
3) Prime minister
4) President of India

200. Which sea is referred to in our National Anthem ?
1) Bay of Bengal
2) Indian ocean
3) Arabian sea
4) No sea is mentioned in it

Answer Key

1) 1	2) 2	3) 2	4) 2	5) 3	6) 1	7) 2	8) 4	9) 1	10) 1
11) 1	12) 3	13) 1	14) 3	15) 3	16) 1	17) 1	18) 2	19) 3	20) 4
21) 1	22) 2	23) 1	24) 2	25) 1	26) 3	27) 4	28) 1	29) 1	30) 3
31) 4	32) 1	33) 4	34) 2	35) 3	36) 3	37) 2	38) 3	39) 4	40) 2
41) 1	42) 3	43) 2	44) 2	45) 2	46) 1	47) 4	48) 3	49) 1	50) 3
51) 1	52) 1	53) 1	54) 1	55) 3	56) 3	57) 1	58) 3	59) 1	60) 1
61) 3	62) 3	63) 2	64) 3	65) 2	66) 1	67) 3	68) 3	69) 3	70) 3
71) 3	72) 1	73) 1	74) 2	75) 1	76) 2	77) 1	78) 2	79) 1	80) 3
81) 4	82) 1	83) 2	84) 1	85) 4	86) 3	87) 1	88) 2	89) 4	90) 1
91) 2	92) 3	93) 2	94) 3	95) 4	96) 3	97) 4	98) 2	99) 1	100) 1
101) 2	102) 2	103) 1	104) 2	105) 3	106) 3	107) 2	108) 2	109) 4	110) 4
111) 1	112) 2	113) 3	114) 3	115) 3	116) 3	117) 1	118) 4	119) 2	120) 1
121) 3	122) 4	123) 3	124) 3	125) 2	126) 3	127) 1	128) 4	129) 1	130) 3
131) 1	132) 4	133) 4	134) 2	135) 3	136) 2	137) 2	138) 2	139) 2	140) 3
141) 1	142) 4	143) 1	144) 3	145) 3	146) 4	147) 2	148) 2	149) 2	150) 3
151) 4	152) 3	153) 4	154) 4	155) 1	156) 2	157) 1	158) 4	159) 2	160) 1
161) 3	162) 1	163) 3	164) 1	165) 2	166) 2	167) 2	168) 4	169) 3	170) 1
171) 4	172) 3	173) 1	174) 4	175) 1	176) 3	177) 1	178) 3	179) 4	180) 1
181) 1	182) 3	183) 2	184) 2	185) 1	186) 4	187) 1	188) 4	189) 3	190) 2
191) 2	192) 2	193) 2	194) 1	195) 2	196) 2	197) 1	198) 3	199) 4	200) 4