Previous Year Question Paper of NEET (AIPMT) Exams

NEET/AIPMT 2009

Main Paper

Original Question Paper with Answer Key

(AIPMT)

NATIONAL ELIGIBILITY CUM ENTRANCE TEST (UG)

CENTRAL BOARD OF SECONDARY EDUCATION, DELHI

Physics

1. In the nuclear decay given below:

$${}^{A}_{Z}X \longrightarrow {}^{A}_{Z+1}Y \longrightarrow {}^{A-4}_{Z-1}B^{*} \longrightarrow {}^{A-4}_{Z-1}B$$

, the particles emitted in the sequence are:

1) γ, β, α
2) β, γ, α
3) α, β, γ
4) β, α, γ

Ans. 4

2. A thin circular ring of mass M and radius R is rotating in a horizontal plane about an axis vertical to its plane with a constant angular velocity If two objects each of mass m be attached gently to the opposite ends of a diameter of the ring, the ring will then rotate with an angular velocity:

1) ωM/(M + 2m)
2) (ω(M + 2m))/M
3) ωM/(M + m)
4) (ω(M - 2m))/(M + 2m)

Ans. 1

3. In thermodynamic processes which of the following statements is not true?

1) In an isochoric process pressure remains constant
2) In an isothermal process the temperature remains constant
3) In an adiabatic process PV^{γ} = constant
4) In an adiabatic process the system is insulated from the surroundings

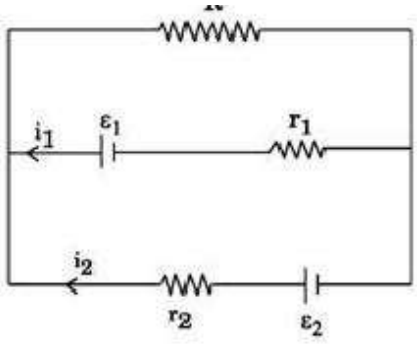
Ans. 1

4. The number of photo electrons emitted for light of a frequency v (higher than the threshold frequency v_0) is proportional to:

1) Threshold frequency (v_0)
2) Intensity of light
3) Frequency of light (v)
4) $v - v_0$

Ans. 2

5. A simple pendulum performs simple harmonic motion about x = 0 with an amplitude a and time period T. The speed of pendulum at x = a/2 will be :



1) $\varepsilon_2 - i_2 r_2 - \varepsilon_1 - i_1 r_1 = 0$

2) $-\varepsilon_2 - (i_1 + i_2) R + i_2 r_2 = 0$

3) $\varepsilon_1 - (i_1 + i_2) R + i_1 r_1 = 0$

4) $\varepsilon_1 - (i_1 + i_2) R - i_1 r_1 = 0$

Ans. 4

7. A body, under the action of a force $\vec{F} = 6\hat{i} - 8\hat{j} + 10\hat{k}$, acquires an acceleration of 1 m/s2. The mass of this body must be:

1) 10 kg

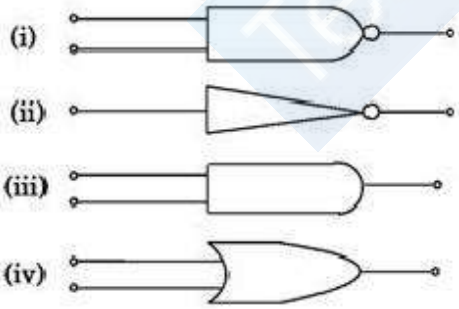
2) 20 kg

3) $10\sqrt{2}$ kg

4) $2\sqrt{10}$ kg

Ans. 3

8. The symbolic representation of four logic gates are given below:



The logic symbols for OR, NOT and NAND gates are respectively:

1) (iv), (i), (iii)

2) (iv), (ii), (i)

3) (i), (iii), (iv)

4) (iii), (iv), (ii)

Ans. 2

9. If $\vec{F}$ is the force acting on a particle having position vector $\vec{r}$ and $\vec{\tau}$ be the torque of this

1) $\vec{r} \cdot \vec{\tau} > 0$ and $\vec{F} \cdot \vec{\tau} < 0$

temperatures T_1 and T_2 ($T_1 > T_2$). The rate of heat transfer, (dQ/dt) through the rod in a steady state is given by:

1) $dQ/dt = (k(T_1 - T_2))/LA$

2) $dQ/dt = kLA(T_1 - T_2)$

3) $dQ/dt = (kA(T_1 - T_2))/L$

4) $dQ/dt = (kL(T_1 - T_2))/A$

Ans. 3

11. A p-n photodiode is fabricated from a semiconductor with a band gap of 2.5 eV. It can detect a signal of wavelength:

1) 4000 nm

2) 6000 nm

3) 4000 Å

4) 6000 Å

Ans. 3

12. If the dimensions of a physical quantity are given by $M^a L^b T^c$, then the physical quantity will be:

1) Velocity if a = 1, b = 0, c = - 1

2) Acceleration if a = 1, b = 1, c = - 2

3) Force if a = 0, b = - 1, c = - 2

4) Pressure if a = 1, b = - 1, c = - 2

Ans. 4

13. A transistor is operated in common-emitter configuration at V_c = 2 V such that a change in the base current from 100µA to 200µA produces a change in the collector current from 5 mA to 10 mA. The current gain is:

1) 100 2) 150 3) 50 4) 75

Ans. 3

14. The mass of a lift is 2000 kg. When the tension in the supporting cable is 28000 N, then its acceleration is:

1) 4 ms^{-2} upwards.

2) 4 ms^{-2} downwards.

3) 14 ms^{-2} upwards.

4) 30 ms^{-2} downwards.

Ans.1

15. Four identical thin rods each of mass M and length l, form a square frame. Moment of

16. Each of the two strings of length 51.6 cm and 49.1 cm are tensioned separately by 20 N force. Mass per unit length of both the strings is same and equal to 1 g/m. When both the strings vibrate simultaneously the number of beats is:

1) 7 2) 8 3) 3 4) 5

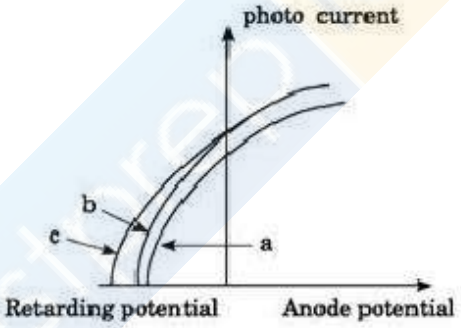
Ans. 1

17. The number of beta particles emitted by a radioactive substance is twice the number of alpha particles emitted by it. The resulting daughter is an:

1) isomer of parent
2) isotone of parent
3) isotope of parent
4) isobar of parent

Ans. 3

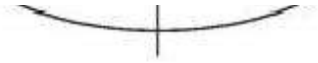
18. The Figure shows a plot of photo current versus anode potential for a photo sensitive surface for three different radiations. Which one of the following is a correct statement?



1) curves (a) and (b) represent incident radiations of same frequency but of different intensities.
2) curves (b) and (c) represent incident radiations of different frequencies and different intensities.
3) curves (b) and (c) represent incident radiations of same frequency having same intensity.
4) curves (a) and (b) represent incident radiations of different frequencies and different intensities.

Ans. 1

19. The Figure shows elliptical orbit of a planet m about the sum S. The shaded area SCD is twice the shaded area SAB. If t_1 is the time for the planet of move from C to D and t_2 is the time to move from A to B then:



1) $t_1 = 4t_2$

2) $t_1 = 2t_2$

3) $t_1 = t_2$

4) $t_1 > t_2$

Ans. 2

20. A black body at 227°C radiates heat at the rate of 7 Cals/cm 2s. At a temperature of 727°C, the rate of heat radiated in the same units will be:

1) 50 2) 112 3) 80 4) 60 *Ans. 2*

21. The driver of a car travelling with speed 30 m/sec towards a hill sounds a horn of frequency 600 Hz. If the velocity of sound in air is 330 m/s, the frequency of reflected sound as heard by driver is:

1) 555.5 Hz

2) 720 Hz

3) 500 Hz

4) 550 Hz *Ans. 2*

22. A wire of resistance 12 ohms per meter is bent to form a complete circle of radius 10 cm. The resistance between its two diametrically opposite points, A and B as shown in the Figure, is:

1) 3 Ω

2) 6 πΩ

3) 6 Ω *Ans. 1*

4) 0.6 πΩ

23. A rectangular, a square, a circular and an elliptical loop, all in the (x - y) plane, are moving out of a uniform magnetic field with a constant velocity, $\vec{V} = v\hat{i}$. The magnetic field is directed along the negative z axis direction. The induced emf, during the passage of these loops, out of the field region, will not remain constant for:

2) only the elliptical loop.

5.0 amp by:

1) putting in series a resistance of 15 Ω
2) putting in series a resistance of 240 Ω
3) putting in parallel a resistance of 15 Ω
4) putting in parallel a resistance of 240 Ω

Ans. 3

25. Power dissipated in an LCR series circuit connected to an a.c source of emf ε is:

1) $\frac{\varepsilon^2\sqrt{R^2+\left(Lw-\frac{1}{Cw}\right)^2}}{R}$

2) $\frac{\varepsilon^2\left[R^2+\left(Lw-\frac{1}{Cw}\right)^2\right]}{R}$

3) $\frac{\varepsilon^2 R}{\sqrt{R^2+\left(Lw-\frac{1}{Cw}\right)^2}}$

4) $\frac{\varepsilon^2 R}{\left[R^2+\left(Lw-\frac{1}{Cw}\right)^2\right]}$

Ans. 4

26. Three concentric spherical shells have radii a, b and c (a < b < c) and have surface charge densities σ, -σ and σ respectively. If V_A, V_B and V_C denote the potentials of the three shells, then for c = a + b, we have:

1) $V_C = V_B \neq V_A$
2) $V_C \neq V_B \neq V_A$
3) $V_C = V_B = V_A$

3) $(1/2)m\ 2v^2$

4) $(1/2)mv^3$

Ans. 4

28. A bar magnet having a magnetic moment of 2×10^4 JT $^{-1}$ is free to rotate in a horizontal plane. A horizontal magnetic field $B = 6 \times 10^{-4}$ T exists in the space. The work done in taking the magnet slowly from a direction parallel to the field to a direction 60° from the field is:

1) 12 J

2) 6 J

3) 2 J

4) 0.6 J

Ans. 2

29. In a Rutherford scattering experiment when a projectile of charge z_1 and mass M_1 approaches a target nucleus of charge z_2 and mass M_2, the distance of closest approach is r_0. The energy of the projectile is:

1) directly proportional to $z_1 z_2$

2) inversely proportional to z_1

3) directly proportional to mass M_1

4) directly proportional to $M_1 \times M_2$

Ans. 1

30. Monochromatic light of wavelength 667 nm is produced by a helium neon laser. The power emitted is 9 mW. The number of photons arriving per sec. On the average at a target irradiated by this beam is:

1) 3×10^{16}

2) 9×10^{15}

3) 3×10^{19}

4) 9×10^{17}

Ans. 1

31. A wave in a string has an amplitude of 2 cm. The wave travels in the + ve direction of x axis with a speed of 128 m/sec. and it is noted that 5 complete waves fit in 4 m length of the string. The equation describing the wave is:

1) y = (0.02) m sin (15.7x - 2010t)

2) y = (0.02) m sin (15.7x + 2010t)

3) y = (0.02) m sin (7.85x - 1005t)

Ans. 3

32. Which one of the following equations of motion represents simple harmonic motion?

33. A student measures the terminal potential difference (V) of a cell (of emf ϵ and internal resistance r) as a function of the current (I) flowing through it. The slope, and intercept, of the graph between V and I, then, respectively, equal:

1) - r and ϵ
2) r and - ϵ
3) - ϵ and r
4) ϵ and - r

Ans. 1

34. If a diamagnetic substance is brought near the north or the south pole of a bar magnet, it is:

1) repelled by the north pole and attracted by the south pole
2) attracted by the north pole and repelled by the south pole
3) attracted by both the poles
4) repelled by both the poles

Ans. 4

35. A bus is moving with a speed of 10 ms^{-1} on a straight road. A scooterist wishes to overtake the bus in 100 s. If the bus is at a distance of 1 km from the scooterist, with what speed should the scooterist chase the bus?

1) 40 ms^{-1}
2) 25 ms^{-1}
3) 10 ms^{-1}
4) 20 ms^{-1}

Ans. 4

36. Sodium has body centred packing. Distance between two nearest atoms is 3.7 Å. The lattice parameter is:

1) 4.3 Å
2) 3.0 Å
3) 8.6 Å
4) 6.8 Å

Ans. 1

37. The internal energy change in a system that has absorbed 2 Kcals of heat and done 500 J of work is:

1) 6400 J
2) 5400 J

3) 3C, 3V

4) C/3, V/3

Ans.2

39. An explosion blows a rock into three parts. Two parts go off at right angles to each other. These two are, 1 kg first part moving with a velocity of 12 ms^{-1} and 2 kg second part moving with a velocity of 8 ms^{-1}. If the third part flies off with a velocity of 4 ms^{-1}, its mass would be:

1) 7 kg

2) 17 kg

3) 3 kg

4) 5 kg

Ans. 4

40. A particle starts its motion from rest under the action of a constant force. If the distance covered in first 10 seconds is S_1 and that covered in the first 20 seconds is S_2, then:

1) $S_2 = 3S_1$

2) $S_2 = 4S_1$

3) $S_2 = S_1$

4) $S_2 = 2S_1$

Ans. 2

41. A body of mass 1 kg is thrown upwards with a velocity 20 m/s. It momentarily comes to rest after attaining a height of 18 m. How much energy is lost due to air friction? ($g = 10\ m/s^2$)

1) 30 J

2) 40 J

3) 10 J

4) 20 J

Ans. 4

42. A conducting circular loop is placed in a uniform magnetic field 0.04 T with its plane perpendicular to the magnetic field. The radius of the loop starts shrinking at 2 mm/s. The induced emf in the loop when the radius is 2 cm is:

1) 4.8 π μV

2) 0.8 π μV

3) 1.6 π μV

4) 3.2 π μV

Ans. 4

43. The magnetic force acting on a charged particle of charge -2 μC in a magnetic field of 2T

44. Two bodies of mass 1 kg and 3 kg have position vectors $\hat{i} + 2\hat{j} + \hat{k}$ and $-3\hat{i} - 2\hat{j} + \hat{k}$, respectively. The centre of mass of this system has a position vector:

1) $-2\hat{i} - \hat{j} + \hat{k}$
2) $2\hat{i} - \hat{j} - 2\hat{k}$
3) $-\hat{i} + \hat{j} + \hat{k}$
4) $-2\hat{i} + 2\hat{k}$

Ans. 1

45. The electric potential at a point (x, y, z) is given by $V = -x^2y - xz^3 + 4$

The electric field at that point is:

1) $\vec{E} = \hat{i}\,2xy + \hat{j}\,(x^2 + y^2) + \hat{k}\,(3xz - y^2)$
2) $\vec{E} = \hat{i}\,z^3 + \hat{j}\,xyz + \hat{k}\,z^2$
3) $\vec{E} = \hat{i}\,(2xy - z^3) + \hat{j}\,xu^2 + \hat{k}\,3z^2x$
4) $\vec{E} = \hat{i}\,(2xy + z^3) + \hat{j}\,x^2 + \hat{k}\,3xz^2$

Ans. 4

46. The mean free path of electrons in a metal is 4×10^{-8} m. The electric field which can given on an average 2 eV energy to an electron in the metal will be in units of V/m:

1) 5×10^{-11}
2) 8×10^{-11}
3) 5×10^{7}
4) 8×10^{7}

Ans. 3

47. The ionization energy of the electron in the hydrogen atom in its ground state is 13.6 eV. The atoms are excited to higher energy levels to emit radiations of 6 wavelengths. Maximum wavelength of emitted radiation corresponds to the transition between:

1) n = 3 to n = 1 states
2) n = 2 to n = 1 states
3) n = 4 to n = 3 states
4) n = 3 to n = 2 states

Ans. 3

48. Under the influence of a uniform magnetic field, a charged particle moves with constant speed V in a circle of radius R. The time period of rotation of the particle:

1) depends on R and not on V
2) is independent of both V and R
3) depends on both V and R

1) moving along x direction with frequency 10^6 Hz and wave length 100 m.

2) moving along x direction with frequency 10^6 Hz and wave length 200 m.

3) moving along - x direction with frequency 10^6 Hz and wave length 200 m.

4) moving along y direction with frequency $2\pi \times 10^6$ Hz and wave length 200 m.

Ans. 2

50. A block of mass M is attached to the lower end of a vertical spring. The spring is hung from a ceiling and has force constant value k. The mass is released from rest with the spring initially unstretched. The maximum extension produced in the length of the spring will be:

1) 2 Mg/k

2) 4 Mg/k

3) Mg/2k

4) Mg/k

Ans. 4

Biology

51. Which one of the following is correct pairing of a body part and the kind of muscle tissue that moves it ?

(1) Biceps of upper arm	Smooth muscle fibres
(2) Abdominal wall	Smooth muscle
(3) Iris	Involuntary smooth muscle
(4) Heart wall	Involuntary unstriated muscle

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

Ans. 2

52. The epithelial tissue present on the inner surface of bronchioles and fallopian tubes is:

1) Glandular

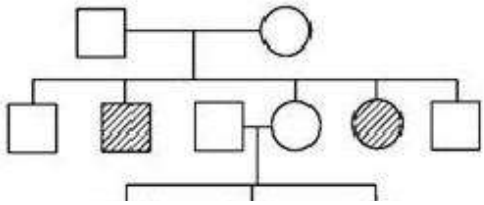
2) Ciliated

3) Squamous

4) Cuboidal

Ans. 2

53. Study the pedigree chart given below:



54. Manganese is required in:

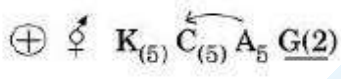
1) Plant cell wall formation
2) Photolysis of water during photosynthesis
3) Chlorophyll synthesis
4) Nucleic acid synthesis

Ans. 2

55. Polyethylene glycol method is used for:

1) Biodiesel production
2) Seedless fruit production
3) Energy production from sewage
4) Gene transfer without a vector

Ans. 4

56. The floral formula  is that of:

1) Soybean
2) Sunnhemp
3) Tobacco
4) Tulip

Ans. 3

57. Which one of the following groups of animals is bilaterally symmetrical and triploblastic ?

1) Aschelminthes (round worms)
2) Ctenophores
3) Sponges
4) Coelenterates (Cnidarians)

Ans. 1

58. Which one of the following is commonly used in transfer of foreign DNA into crop plants ?

1) Meloidogyne incognita
2) Agrobacterium tumefaciens
3) Penicillium expansum
4) Trichoderma harzianum

Ans. 2

59. Which one of the following is the correct matching of the events occurring during menstrual cycle ?

(1)	Proliferative phase	Rapid regeneration of myometrium and maturation of Graafian follicle.
(2)	Development of corpus	Secretory phase and increased secretion of

60. Which one is the wrong pairing for the disease and its causal organism ?

(1)	Black rust of wheat	Puccinia graminis
(2)	Loose smut of wheat	Ustilago nuda
(3)	Root-knot of vegetables	Meloidogyne sp
(4)	Late blight of potato	Alternaria solani

1) 1 2) 2 3) 3 4) 4 ***Ans. 4***

61. Global agreement in specific control strategies to reduce the release of ozone depleting substances, was adopted by:

1) The Montreal Protocol
2) The Koyoto Protocol
3) The Vienna Convention
4) Rio de Janeiro Conference

Ans. 1

62. What is true about Bt toxin ?

1) Bt protein exists as active toxin in the Bacillus.
2) The activated toxin enters the ovaries of the pest to sterilise it and thus prevent its multiplication.
3) The concerned Bacillus has antitoxins.
4) The inactive protoxin gets converted into active form in the insect gut.

Ans. 4

63. Peripatus is a connecting link between:

1) Mollusca and Echinodermata
2) Annelida and Arthropoda
3) Coelenterata and Porifera
4) Ctenophora and Platyhelminthis

Ans. 2

64. T.O. Diener discovered a:

1) Free infectious DNA
2) Infectious protein
3) Bacteriophage
4) Free infectious RNA

Ans. 4

65. Seminal plasma in humans is rich in:

2) Syconus
3) Caryopsis
4) Hesperidium

Ans. 2

67. The cell junctions called tight, adhering and gap junctions are found in:
1) Connective tissue
2) Epithelial tissue
3) Neural tissue
4) Muscular tissue

Ans. 2

68. What will happen if the stretch receptors of the urinary bladder wall are totally removed ?
1) Micturition will continue
2) Urine will continue to collect normally in the bladder
3) There will be no micturition
4) Urine will not collect in the bladder

Ans. 3

69. If a live earthworm is pricked with a needle on its outer surface without damaging its gut, the fluid that comes out is:
1) coelomic fluid
2) haemolymph
3) slimy mucus
4) excretory fluid

Ans. 1

70. The most popularly known blood grouping is the ABO grouping. It is named ABO and not ABC, because "O" in it refers to having:
1) overdominance of this type on the genes for A and B types
2) one antibody only - either anti-A or anti-B on the RBCs
3) no antigens A and B on RBCs
4) other antigens besides A and B on RBCs

Ans. 3

71. One of the synthetic auxin is:
1) IAA 2) GA 3) IBA 4) NAA

Ans. 4

72. A person likely to develop tetanus is immunised by administering:
1) Preformed antibodies

3) gamma aminobutyric acid (GABA)

4) dopamine

Ans. 2

74. Biochemical Oxygen Demand (BOD) in a river water:

1) has no relationship with concentration of oxygen in the water.

2) gives a measure of salmonella in the water.

3) increases when sewage gets mixed with river water.

4) remains unchanged when algal bloom occurs.

Ans. 3

75. The genetic defect - adenosine deaminase (ADA) deficiency may be cured permanently by:

1) administering adenosine deaminase activators.

2) introducing bone marrow cells producing ADA into cells at early embryonic stages.

3) enzyme replacement therapy.

4) periodic infusion of genetically engineered lymphocytes having functional ADA cDNA.

Ans. 2

76. Compared to blood our lymph has:

1) plasma without proteins

2) more WBCs and no RBCs

3) more RBCs and less WBCs

4) no plasma

Ans. 2

77. Sickle cell anemia is:

1) caused by substitution of valine by glutamic acid in the beta globin chain of haemoglobin

2) caused by a change in a single base pair of DNA

3) characterized by elongated sickle like RBCs with a nucleus

4) an autosomal linked dominant trait

Ans. 2

78. Which of the following plant species you would select for the production of bioethanol ?

1) Zea mays

2) Pongamia

3) Jatropha

4) Brassica

Ans. 3

79. When breast feeding is replaced by less nutritive food low in proteins and calories; the

stools which the infant passes out is quite yellowish. What is this yellow colour due to ?

1) Bile pigments passed through bile juice
2) Undigested milk protein casein
3) Pancreatic juice poured into duodenum
4) Intestinal juice

Ans. 1

81. Which one of the following has maximum genetic diversity in India?

1) Mango
2) Wheat
3) Tea
4) Teak

Ans.2

82. Oxygenic photosynthesis occurs in:

1) Oscillatoria
2) Rhodospirillum
3) Chlorobium
4) Chromatium

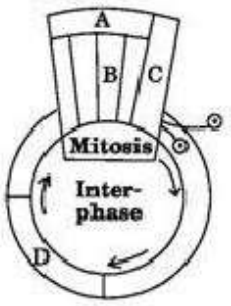
Ans. 1

83. There is no DNA in:

1) Mature RBCs
2) A mature spermatozoan
3) Hair root
4) An enucleated ovum

Ans. 1

84. Given below is a schematic break-up of the phases / stages of cell cycle:



Which one of the following is the correct indication of the stage/phase in the cell cycle ?

1) C-Karyokinesis
2) D-Synthetic phase

4) Ranthambhor

Ans. 2

86. Which one of the following statements is true regarding digestion and absorption of food in humans ?

1) Fructose and amino acids are absorbed through intestinal mucosa with the help of carrier ions like Na+.

2) Chylomicrons are small lipoprotein particles that are transported from intestine into blood capillaries.

3) About 60% of starch is hydrolysed by salivary amylase in our mouth.

4) Oxyntic cells in our stomach secrete the proenzyme pepsinogen.

Ans. 1

87. Synapsis occurs between:

1) mRNA and ribosomes

2) spindle fibres and centromere

3) two homologous chromosomes

4) a male and a female gamete

Ans. 3

88. Given below is a diagrammatic sketch of a portion of human male reproductive system. Select the correct set of the names of the parts labelled A, B, C, D.

	A	B	C	D
(1)	vas deferens	seminal vesicle	prostate	bulbourethral gland
(2)	vas deferens	seminal vesicle	bulbourethral gland	prostate
(3)	ureter	seminal vesicle	prostate	bulbourethral gland
(4)	ureter	prostate	seminal vesicle	bulbourethral gland

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

Ans. 1

89. What is not true for genetic code?

1) It is nearly universal

2) It is degenerate

Ans. 4

4) Marchantia

91. Cyclic photophosphorylation results in the formation of

1) ATP and NADPH
2) ATP, NADPH and O_2
3) ATP
4) NADPH

Ans. 3

92. The letter T in T-lymphocyte refers to:

1) Thalamus
2) Tonsil
3) Thymus
4) Thyroid

Ans. 3

93. Foetal ejection reflex in human female is induced by:

1) release of oxytocin from pituitary
2) fully developed foetus and placenta
3) differentiation of mammary glands
4) pressure exerted by amniotic fluid

Ans. 2

94. Anatomically fairly old dicotyledonous root is distinguished from the dicotyledonous stem by

1) Absence of secondary phloem
2) Presence of cortex
3) Position of protoxylem
4) Absence of secondary xylem

Ans. 3

95. Plasmodesmata are :

1) Locomotary structures
2) Membranes connecting the nucleus with plasmalemma
3) Connections between adjacent cells
4) Lignified cemented layers between cells

Ans. 3

96. Removal of introns and joining the exons in a defined order in a transcription unit is called:

1) Tailing
2) Transformation
4) Splicing

4) Evolutionary relationships

Ans.4

98. Which part of human brain is concerned with the regulation of body temperature?

1) Cerebellum
2) Cerebrum
3) Hypothalamus
4) Medulla Oblongata

Ans.3

99. Semiconservative replication of DNA was first demonstrated in:

1) Escherichia coli
2) Streptococcus pneumoniae
3) Salmonella typhimurium
4) Drosophila melanogaster

Ans.1

100. Which one of the following pairs of animals comprises 'jawless fishes'?

1) Mackerals and Rohu
2) Lampreys and hag fishes
3) Guppies and hag fishes
4) Lampreys and eels

Ans. 2

101. Which of the following is a pair of viral diseases ?

1) Common Cold, AIDS
2) Dysentery, Common Cold
3) Typhoid, Tuberculosis
4) Ringworm, AIDS

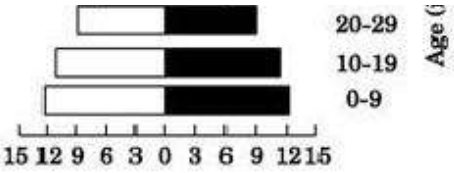
Ans. 1

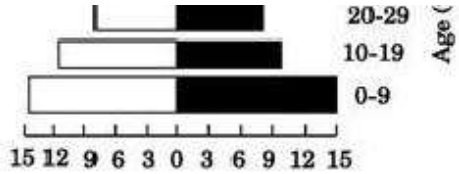
102. Aerobic respiratory pathway is appropriately termed:

1) Parabolic
2) Amphibolic
3) Anabolic
4) Catabolic

Ans. 2

103. A country with a high rate of population growth took measures to reduce it. The Figure below shows age-sex pyramids of populations A and B twenty years apart. Select the correct interpretation about them:





Interpretations:

1) "B" is earlier pyramid and shows stabilised growth rate.
2) "B" is more recent showing that population is very young.
3) "A" is the earlier pyramid and no change has occurred in the growth rate.
4) "A" is more recent and shows slight reduction in the growth rate.

Ans. 4

104. Cytoskeleton is made up of:

1) Callose deposits
2) Cellulosic microfibrils
3) Proteinaceous filaments
4) Calcium carbonate granules

Ans. 3

105. An example of axile placentation is:

1) Dianthus
2) Lemon
3) Marigold
4) Argemone

Ans. 2

106. Which one of the following has haplontic life cycle ?

1) Polytrichum
2) Ustilago
3) Wheat
4) Funaria

Ans. 2

107. Steps taken by the Government of India to control air pollution include:

1) compulsory PUC (Pollution Under Control) certification of petrol driven vehicles which tests for carbon monoxide and hydrocarbons.
2) permission to use only pure diesel with a maximum of 500 ppm sulphur as fuel for vehicles.
3) use of non-polluting Compressed Natural Gas (CNG) only as fuel by all buses and trucks.

Ans. 1

108. Which one of the following is considered important in the development of seed habit?

109. The annular and spirally thickened conducting elements generally develop in the protoxylem when the root or stem is:

1) elongating
2) widening
3) differentiating
4) maturing

Ans. 4

110. The correct sequence of plants in a hydrosere is:

1) Volvox → Hydrilla → Pistia → Scirpus → Lantana → Oak
2) Pistia → Volvox → Scirpus → Hydrilla → Oak → Lantana
3) Oak → Lantana → Volvox → Hydrilla → Pistia → Scirpus
4) Oak → Lantana → Scirpus → Pistia → Hydrilla → Volvox

Ans. 1

111. Stroma in the chloroplasts of higher plant contains:

1) Light-dependent reaction enzymes
2) Ribosomes
3) Chlorophyll
4) Light-independent reaction enzymes

Ans. 4

112. A health disorder that results from the deficiency of thyroxine in adults and characterised by (i) a low metabolic rate, (ii) increase in body weight and (iii) tendency to retain water in tissues is:

1) simple goitre
2) myxoedema
3) cretinism
4) hypothyroidism

Ans. 2

113. Mannitol is the stored food in:

1) Porphyra
2) Fucus
3) Gracillaria
4) Chara

Ans. 2

114. Which one of the following pairs is wrongly matched ?

1) Alcohol - nitrogenase

3) Xanthomonas campestris

4) Bacillus thuringiensis

Ans. 3

116. Which one of the following is a vascular cryptogam?

1) Ginkgo

2) Marchantia

3) Cedrus

4) Equisetum

Ans. 4

117. In a standard ECG which one of the following alphabets is the correct representation of the respective activity of the human heart?

1) S - start of systole

2) T - end of diastole

3) P - depolarisation of the atria

4) R - repolarisation of ventricles

Ans. 3

118. Uric acid is the chief nitrogenous component of the excretory products of:

1) Earthworm

2) Cockroach

3) Frog

4) Man

Ans. 2

119. Guard cells help in:

1) Transpiration

2) Guttation

3) Fighting against infection

4) Protection against grazing

Ans. 1

120. Montreal Protocol aims at:

1) Biodiversity conservation

2) Control of water pollution

3) Control of CO_2 emission

4) Reduction of ozone depleting substances

Ans. 4

121. DDT residues are rapidly passed through food chain causing biomagnification because

1) Offset
2) Rhizome
3) Sucker
4) Runner

Ans. 3

123. Select the incorrect statement from the following:

1) Galactosemia is an inborn error of metabolism
2) Small population size results in random genetic drift in a population
3) Baldness is a sex-limited trait
4) Linkage is an exception to the principle of independent assortment in heredity

Ans. 3

124. Cotyledons and testa respectively are edible parts in:

1) walnut and tamarind
2) french bean and coconut
3) cashew nut and litchi
4) groundnut and pomegranate

Ans. 4

125. Which one of the following statements is correct ?

1) Benign tumours show the property of metastasis.
2) Heroin accelerates body functions.
3) Malignant tumours may exhibit metastasis.
4) Patients who have undergone surgery are given cannabinoids to relieve pain.

Ans. 3

126. The correct sequence of spermatogenetic stages leading to the formation of sperms in a mature human testis is:

1) spermatogonia - spermatocyte - spermatid - sperms
2) spermatid - spermatocyte - spermatogonia - sperms
3) spermatogonia - spermatid - spermatocyte - sperms
4) spermatocyte - spermatogonia - spermatid - sperms

Ans. 1

127. Use of anti-histamines and steroids give a quick relief from:

1) Nausea
2) Cough
3) Headache
4) Allergy

Ans. 4

129. Which one of the following is the most likely root cause why menstruation is not taking place in regularly cycling human female ?

1) maintenance of the hypertrophical endometrial lining
2) maintenance of high concentration of sex hormones in the blood stream
3) retention of well-developed corpus luteum
4) fertilisation of the ovum

Ans. 4

130. Globulins contained in human blood plasma are primarily involved in:

1) osmotic balance of body fluids
2) oxygen transport in the blood
3) clotting of blood
4) defence mechanisms of body

Ans. 4

131. Palisade parenchyma is absent in leaves of :

1) Mustard
2) Soybean
3) Gram
4) Sorghum

Ans. 4

132. In barley stem vascular bundles are:

1) closed and scattered
2) open and in a ring
3) closed and radial
4) open and scattered

Ans. 1

133. Which one of the following is the correct matching of three items and their grouping category ?

	Items	Group
(1)	ilium, ischium, pubis	coxal bones of pelvic girdle
(2)	actin, myosin, rhodopsin	muscle proteins
(3)	cytosine, uracil, thiamine	pyrimidines
(4)	malleus, incus, cochlea	ear ossicles

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

Ans. 1

over the light-coloured form in England during industrial revolution. This is an example of :

1) appearance of the darker coloured individuals due to very poor sunlight
2) protective mimicry
3) inheritance of darker colour character acquired due to the darker environment
4) natural selection whereby the darker forms were selected

Ans. 2

136. Transgenic plants are the ones:

1) generated by introducing foreign DNA into a cell and regenerating a plant from that cell.
2) produced after protoplast fusion in artificial medium.
3) grown in artificial medium after hybridization in the field.
4) produced by a somatic embryo in artificial medium.

Ans. 1

137. Which one of the following pairs of food components in humans reaches the stomach totally undigested?

1) Starch and fat
2) Fat and cellulose
3) Starch and cellulose
4) Protein and starch

Ans. 2

138. A change in the amount of yolk and its distribution in the egg will affect:

1) Pattern of cleavage
2) Number of blastomeres produced
3) Fertilization
4) Formation of zygote

Ans. 1

139. Middle lamella is composed mainly of:

1) Muramic acid
2) Calcium pectate
3) Phosphoglycerides
4) Hemicellulose

Ans. 2

140. Elbow joint is an example of:

1) hinge joint
2) gliding joint
3) ball and socket joint

Ans. 1

142. Whose experiments cracked the DNA and discovered unequivocally that a genetic code is a "triplet"?

1) Hershey and Chase
2) Morgan and Sturtevant
3) Beadle and Tatum
4) Nirenberg and Mathaei

Ans. 4

143. Which one of the following types of organisms occupy more than one trophic level in a pond ecosystem ?

1) Fish
2) Zooplankton
3) Frog
4) Phytoplankton

Ans. 1

144. Which one of the following acids is a derivative of carotenoids ?

1) Indole-3-acetic acid
2) Gibberellic acid
3) Abscisic acid
4) Indole butyric acid

Ans. 3

145. The bacterium Bacillus thuringiensis is widely used in contemporary biology as:

1) Insecticide
2) Agent for production of dairy products
3) Source of industrial enzyme
4) Indicator of water pollution

Ans. 1

146. An example of a seed with endosperm, perisperm, and caruncle is:

1) coffee
2) lily
3) castor
4) cotton

Ans. 3

147. Reduction in vascular tissue, mechanical tissue and cuticle is characteristic of :

1) Mesophytes

3) Deletion

4) Insertion

Ans. 1

149. Which one of the following correctly describes the location of some body parts in the earthworm Pheretima ?

1) Four pairs of spermathecae in 4 - 7 segments.

2) One pair of ovaries attached at intersegmental septum of 14th and 15th segments.

3) Two pairs of testes in 10th and 11th segments.

4) Two pairs of accessory glands in 16 - 18 segments.

Ans. 3

150. The kind of tissue that forms the supportive structure in our pinna (external ears) is also found in:

1) nails

2) ear ossicles

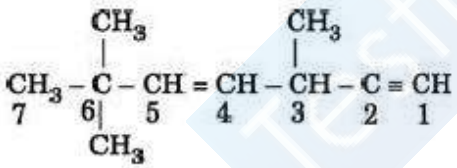
3) tip of the nose

4) vertebrae

Ans. 3

Chemistry

151. The state of hybridization of C2, C3, C5 and C6 of the hydrocarbon,



is in the following sequence:

1) sp^3, sp^2, sp^2 and sp

2) sp, sp^2, sp^2 and sp^3

3) sp, sp^2, sp^3 and sp^2

4) sp, sp^3, sp^2 and sp^3

Ans. 4

152. Oxidation numbers of P in PO_4^{3-}, of S in SO_4^{2-} and that of Cr in $Cr_2O_7^{2-}$, are respectively :

1) + 3, + 6 and + 5

2) + 5, + 3 and + 6

3) - 3, + 6 and + 6

4) + 5, + 6 and + 6

Ans. 4

unit cell of lithium is 351 pm, the atomic radius of the lithium will be:

154. Which of the following reactions is an example of nucleophilic susbtitution reaction?

1) $2\ RX + 2\ Na \rightarrow R - R + 2\ NaX$

2) $RX + H_2 \rightarrow RH + HX$

3) $RX + Mg \rightarrow RMgX$

4) $RX + KOH \rightarrow ROH + KX$

Ans. 4

155. In the case of alkali metals, the covalent character decreases in the order:

1) MF > MCl > MBr > MI

2) MF > MCl > MI > MBr

3) MI > MBr > MCl > MF

4) MCl > MI > MBr > MF

Ans.3

156. Which one of the elements with the following outer orbital configurations may exhibit the largest number of oxidation states?

1) $3d^5 4s^1$

2) $3d^5 4s^2$

3) $3d^2 4s^2$

4) $3d^3 4s^2$

Ans. 2

157. The stability of + 1 oxidation state increases in the sequence:

1) Tl < In < Ga < Al

2) In < Tl < Ga < Al

3) Ga < In < Al < Tl

4) Al < Ga < In < Tl

Ans. 4

158. Given:

(i) $Cu^{2+} + 2e^- \rightarrow Cu$, $E^\circ = 0.337$ V

(ii) $Cu^{2+} + e^- \rightarrow Cu^+$, $E^\circ = 0.153$ V

Electrode potential, E° for the reaction, $Cu^+ + e^- \rightarrow Cu$, will be:

1) 0.90 V

2) 0.30 V

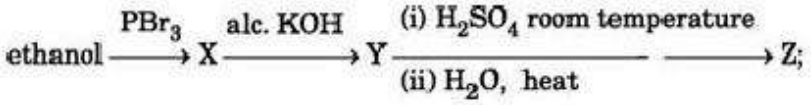
3) 0.38 V

4) 0.52 V

Ans. 4

$a[r.z])$ at would be :

160. Consider the following reaction,



the product Z is:

1) $CH_3CH_2 - O - CH_2 - CH_3$

2) $CH_3 - CH_2 - O - SO_3H$

3) CH_3CH_2OH

4) $CH_2 = CH_2$

Ans. 3

161. The energy absorbed by each molecule (A_2) of a substance is 4.4×10^{-19} J and bond energy per molecule is 4.0×10^{-19} J. The kinetic energy of the molecule per atom will be:

1) 2.2×10^{-19} J

2) 2.0×10^{-19} J

3) 4.0×10^{-20} J

4) 2.0×10^{-20} J

Ans. 4

162. Amongst the elements with following electronic configurations, which one of them may have the highest ionization energy?

1) Ne [$3s^2 3p^2$]

2) Ar [$3d^{10} 4s^2 4p^3$]

3) Ne [$3s^2 3p^1$]

4) Ne [$3s^2 3p^3$]

Ans. 4

163. In the reaction $BrO_3^-(aq) + 5\,Br^-(aq) + 6H^+ \rightarrow 3\,Br_2(l) + 3\,H_2O(l)$. The rate of appearance of bromine (Br_2) is related to rate of disappearance of bromide ions as follwing :

1) $\frac{d\left(Br_2\right)}{dt} = -\frac{5}{3}\frac{d\left(Br^-\right)}{dt}$

2) $\frac{d\left(Br_2\right)}{dt} = \frac{5}{3}\frac{d\left(Br^-\right)}{dt}$

$$\frac{}{dt} = -\frac{}{5}\frac{}{dt}$$

164. A 0.0020 m aqueous solution of an ionic compound $Co(NH_3)_5(NO_2)Cl$ freezes at -0.00732°C. Number of moles of ions which 1 mol of ionic compound produces on being dissolved in water will be (k_f = - 1.86°C/m)

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

Ans. 4

165. What is the dominant intermolecular force or bond that must be overcome in converting liquid CH_3OH to a gas?

1) Dipole-dipole interaction
2) Covalent bonds
3) London dispersion force
4) Hydrogen bonding

Ans. 4

166. Which of the following oxides is not expected to react with sodium hydroxide?

1) CaO
2) SiO_2
3) BeO
4) B_2O_3

Ans. 1

167. The segment of DNA which acts as the instrumental manual for the synthesis of the protein is:

1) ribose
2) gene
3) nucleoside
4) nucleotide

Ans. 2

168. Maximum number of electrons in a subshell of an atom is determined by the following:

1) 2 l + 1
2) 4 l - 2
3) 2 n^2
4) 4 l + 2

Ans. 4

169. Half life period of a first-order reaction is 1386 seconds. The specific rate constant of the

1) Naproxen
2) Tetracycline
3) Chlorpheninamine
4) Equanil

Ans. 4

171. Al_2O_3 is reduced by electrolysis at low potentials and high currents. If 4.0×10^4 amperes of current is passed through molten Al_2O_3 for 6 hours, what mass of aluminium is produced? (Assume 100% current efficiency. At. mass of Al = 27 g mol^{-1})

1) 8.1×10^4 g
2) 2.4×10^5 g
3) 1.3×10^4 g
4) 9.0×10^3 g

Ans. 1

172. Benzene reacts with CH_3Cl in the presence of anhydrous $AlCl_3$ to form:

1) Chlorobenzene
2) Benzylchloride
3) Xylene
4) Toluene

Ans. 4

173. Which of the following is not permissible arrangement of electrons in an atom?

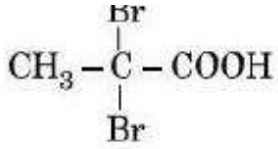
1) n = 5, l = 3, m = 0, s = + 1/2
2) n = 3, l = 2, m = - 3, s = - 1/2
3) n = 3, l = 2, m = -2, s = - 1/2
4) n = 4, l = 0, m = 0, s = - ?

Ans. 2

174. The dissociation constants for acetic acid and HCN at 25°C are 1.5×10^{-5} and 4.5×10^{-10} respectively. The equilibrium constant for the equilibrium
$CN^- + CH_3COOH \rightleftharpoons HCN + CH_3COO^-$ would be:

1) 3.0×10^{-5}
2) 3.0×10^{-4}
3) 3.0×10^4
4) 3.0×10^5

Ans. 3

3) 

4) $CH_2Br - CHBr - COOH$

Ans. 3

176. The values of ΔH and ΔS for the reaction, $C_{(graphite)} + CO_{2\,(g)} \rightarrow 2CO_{(g)}$ are 170 kJ and 170 JK^{-1}, respectively. This reaction will be spontaneous at

1) 910 K
2) 1110 K
3) 510 K
4) 710 K

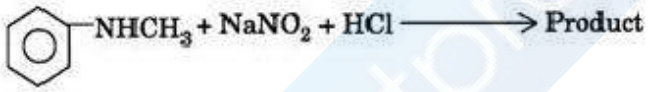
2

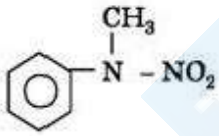
177. Copper crystallises in a face-centred cubic lattice with a unit cell length of 361 pm. What is the radius of copper atom in pm?

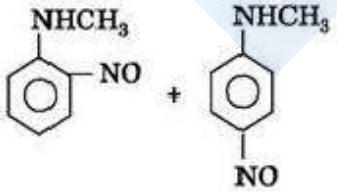
1) 157 2) 181 3) 108 4) 128

Ans. 4

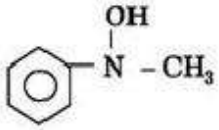
178. Predict the product :

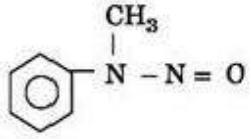


1) 

2) 

Ans. 4

3) 

4) 

180. According to MO theory which of the following lists ranks the nitrogen species in terms of increasing bond order?

1) $N_2^{2-} < N_2^{-} < N_2$

2) $N_2 < N_2^{2-} < N_2^{-}$

3) $N_2^{-} < N_2^{2-} < N_2$

4) $N_2^{-} < N_2 < N_2^{2-}$

Ans. 1

181. Out of TiF_6^{2-}, COF_6^{3-}, Cu_2Cl_2 and $NiCl_4^{2-}$ (Z of Ti = 22, CO = 27, Cu = 29, Ni = 28) the colourless species are :

1) Cu_2Cl_2 and $NiCl_4^{2-}$

2) TiF_6^{2-} and Cu_2Cl_2

3) COF_6^{3-} and $NiCl_4^{2-}$

4) TiF_6^{2-} and COF_6^{3-}

Ans. 2

182. Which of the following molecules acts as a Lewis acid?

1) $(CH_3)_2O$

2) $(CH_3)_3P$

3) $(CH_3)_3N$

4) $(CH_3)_3B$

Ans. 4

183. The IUPAC name of the compound having the formula $CH \equiv C - CH = CH_2$ is:

1) 1-butyn-3-ene

2) but-1-yne-3-ene

3) 1-butene-3-yne

4) 3-butene-1-yne

Ans. 3

184. Which of the following compounds will exhibit cis-trans (geometrical) isomerism?

1) Butanol

2) 2-Butyne

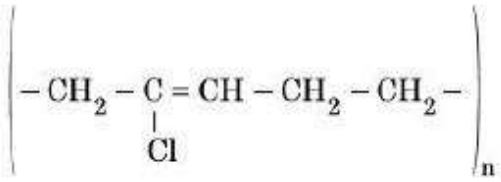
3) 2-Butenol

4) 2-Butene

185. Which of the following does not show optical isomerism?

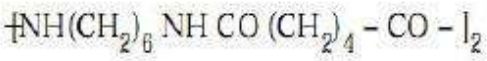
186. Structures of some common polymers are given. Which one is not correctly presented?

1) Neoprene

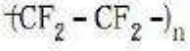


2) Terylene

3) Nylon 66



4) Teflon



Ans. 1

187. The ionization constant of ammonium hydroxide is 1.77×10^{-5} at 298 K. Hydrolysis constant of ammonium chloride is:

1) 6.50×10^{-12}

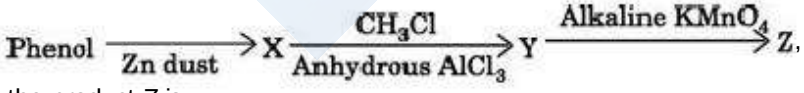
2) 5.65×10^{-13}

3) 5.65×10^{-12}

4) 5.65×10^{-10}

Ans. 4

188. Consider the following reaction:



the product Z is:

1) Benzaldehyde

2) Benzoic acid

3) Benzene

4) Toluene

Ans. 2

189. The equivalent conductance of M/32 solution of a weak monobasic acid is 8.0 mhos cm^2 and at infinite dilution is 400 mhos cm^2. The dissociation constant of this acid is :

1) 1.25×10^{-6}

3) hydrolysis of $(CH_3)_2SiCl_2$ followed by condensation polymerisation

4) hydrolysis of $(CH_3)_3SiCl$ followed by condensation polymerisation

Ans. 3

191. From the following bond energies:

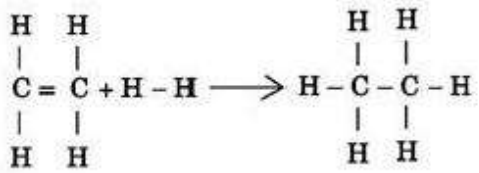
H − H bond energy: 431.37 kJ mol^{-1}

C = C bond energy: 606.10 kJ mol^{-1}

C − C bond energy: 336.49 kJ mol^{-1}

C − H bond energy: 410.50 kJ mol^{-1}

Enthalpy for the reaction,



will be:

1) -243.6 kJ mol^{-1}

2) -120.0 kJ mol^{-1}

3) -553.0 kJ mol^{-1}

4) -1523.6 kJ mol^{-1}

Ans. 2

192. 10 g of hdyrogen and 64 g of oxygen were filled in a steel vessel and exploded. Amount of water produced in this reaction will be:

1) 3 mol

2) 4 mol

3) 1 mol

4) 2 mol

Ans. 2

193. Among the following which is the strongest oxidising agent?

1) Br_2

2) I_2

3) Cl_2

4) F_2

Ans. 4

194. In which of the following molecules / ions BF_3, NO_2^-, NH_2^- and H_2O, the central atom is sp^2 hybridized?

195. Nitrobenzene can be prepared from benzene by using a mixture of conc. HNO_3 and conc. H_2SO_4 in the mixture, nitric acid acts as a/an:

1) acid
2) base
3) catalyst
4) reducing agent

Ans. 2

196. Which of the following complex ions is expected to absorb visible light?

1) $[Ti\ (en)_2\ (NH_3)_2]^{4+}$
2) $[Cr\ (NH_3)_6]^{3+}$
3) $[Zn\ (NH_3)_6]^{2+}$
4) $[Sc\ (H_2O)_3\ (NH_3)_3]^{3+}$

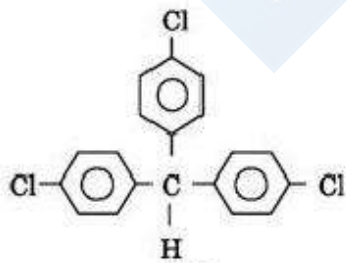
Ans. 2

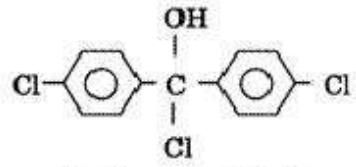
197. What is the $[OH^-]$ in the final solution prepared by mixing 20.0 mL of 0.050 M HCl with 30.0 mL of 0.10 M $Ba(OH)_2$?

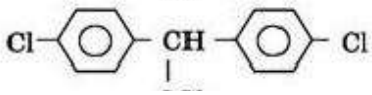
1) 0.40 M
2) 0.0050 M
3) 0.12 M
4) 0.10 M

Ans. 4

198. Trichloroacetaldehyde, CCl_3CHO reacts with chlorobenzene in presence of sulphuric acid and produces:

1) 

2) 

3) 

Ans. 3

(a) on doubling the initial concentration of A only, the rate of reaction is also doubled and
(b) on doubling the initial concentrations of both A and B, there is a change by a factor of 8 in the rate of the reaction.
The rate of this reaction is given by:

1) rate = k [A] $[B]^2$

2) rate = k $[A]^2$ $[B]^2$

3) rate = k [A] [B]

4) rate = k $[A]^2$ [B]

Ans. 1

200. Which of the following hormones contains iodine?

1) testosterone

2) adrenaline

3) thyroxine

4) insulin

Ans. 3