

80 previous-year questions, every one with the official answer and a worked solution.

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NSEC 2008

Time: 120 minutes · Maximum marks: 240 · Questions: 80

1. Salicylic acid is a stronger acid than p-hydroxybenzoic acid due to

- (A) Steric hindrance (B) Hydrogen bonding
(C) Mesomeric effect (D) Solvation energy

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

2. To reduce a nitroaldehyde to a nitroalcohol the reducing agent of choice is

- (A) LiAlH_4 (B) NaBH_4
(C) Molecular H_2 (D) SnCl_2

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

3. The product of Reimer-Tiemann reaction is a

- (A) phenolic aldehyde (B) hydroxyamine
(C) nitroaldehyde (D) nitroalcohol

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

4. In the Dumas method for the estimation of nitrogen, 0.0237 grams of an organic compound gave 2.21 mL of nitrogen at 754.32 mm of Hg pressure at 18 °C. (Aqueous tension at 18 °C is 15.4 mm of Hg.) Therefore the percentage of nitrogen in the compound is
- (A) 20.67% (B) 10.6%
(C) 11.2% (D) 13.9%

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

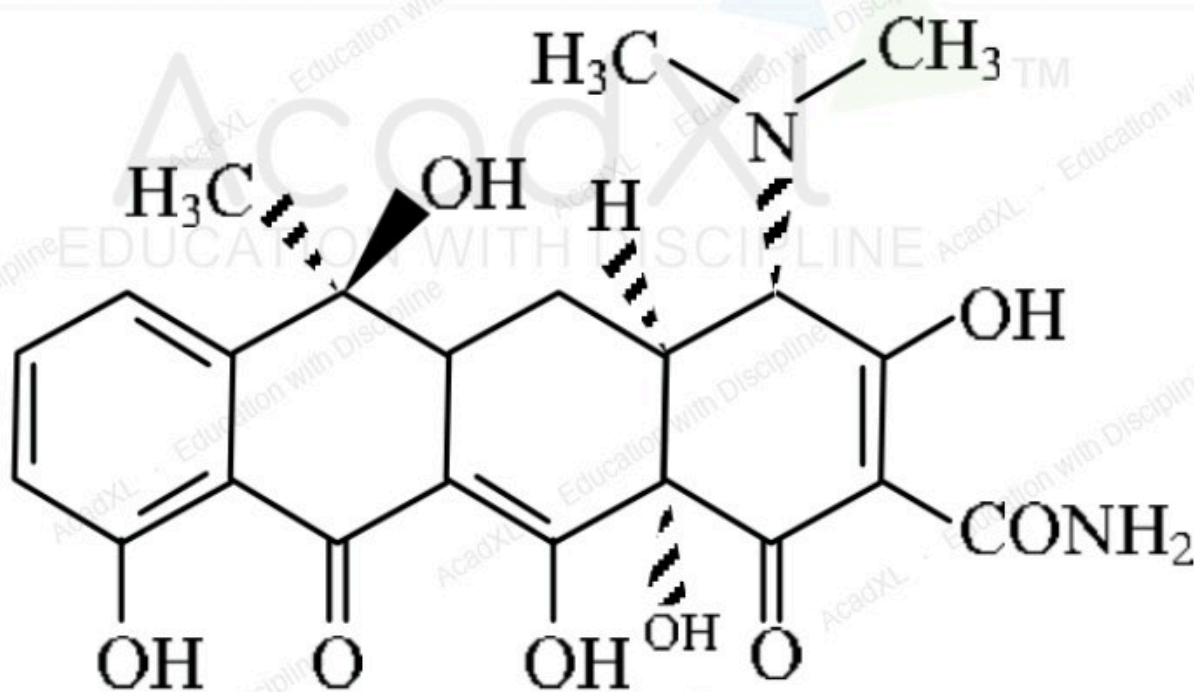
5. Which one of the following compounds can be deprotonated by OH^- fastest?
- (A) HCOOH , $\text{p}K_a = 3.8$ (B) H_2S , $\text{p}K_a = 7.0$
(C) Toluene, $\text{p}K_a = 41$ (D) CH_3NH_2 , $\text{p}K_a = 40$

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

6. How many chiral carbon atoms does Tetracycline A (a broad spectrum antibiotic) have?



- (A) 3 (B) 4
(C) 5 (D) 6

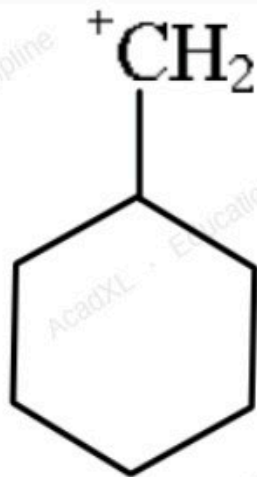
[3 marks, -1 for a wrong answer]

ANSWER: C

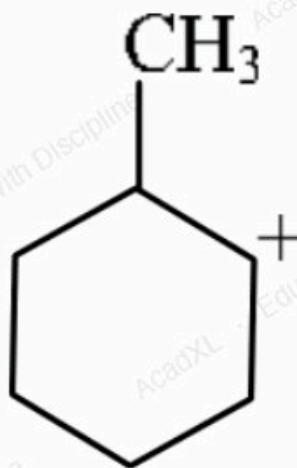
No solution stored for this question.

7. Which one of the following carbocations will not rearrange?

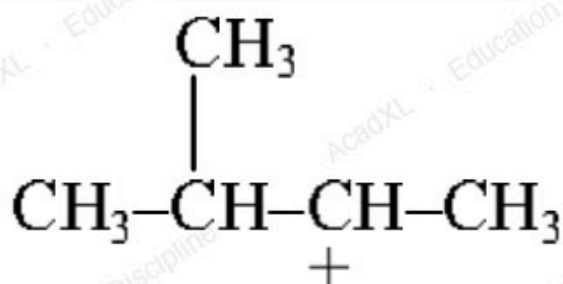
(A)



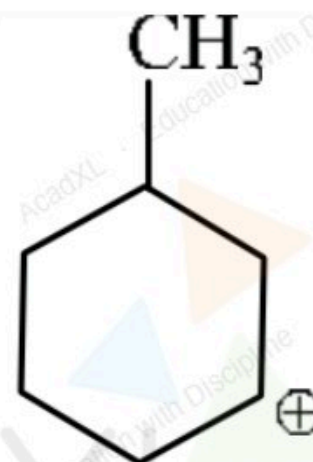
(B)



(C)



(D)

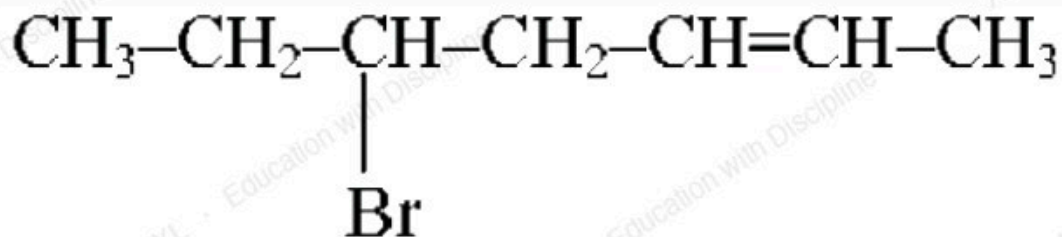
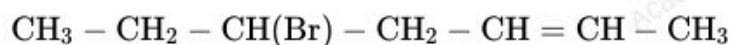


[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

8. How many stereoisomers does the following compound have?



(A) None

(B) 2

(C) 4

(D) 6

[3 marks, -1 for a wrong answer]

ANSWER: C

No solution stored for this question.

9. Which of the following is a "superacid"?

(A) $(\text{HF} + \text{SbF}_5)$ in SO_2

(B) $(\text{H}_2\text{SO}_4 + \text{SO}_3)$ in SO_2

(C) $(\text{HNO}_3 + \text{BF}_3)$ in SO_2

(D) $(\text{H}_3\text{PO}_4 + \text{PF}_5)$ in SO_2

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

10. Which of the following series contains only nucleophiles?

(A) $\text{NH}_3, \text{H}_2\text{O}, \text{CN}^-, \text{I}^-$

(B) $\text{AlCl}_3, \text{NH}_3, \text{H}_2\text{O}, \text{I}^-$

(C) $\text{AlCl}_3, \text{BF}_3, \text{H}_2\text{O}, \text{NH}_3$

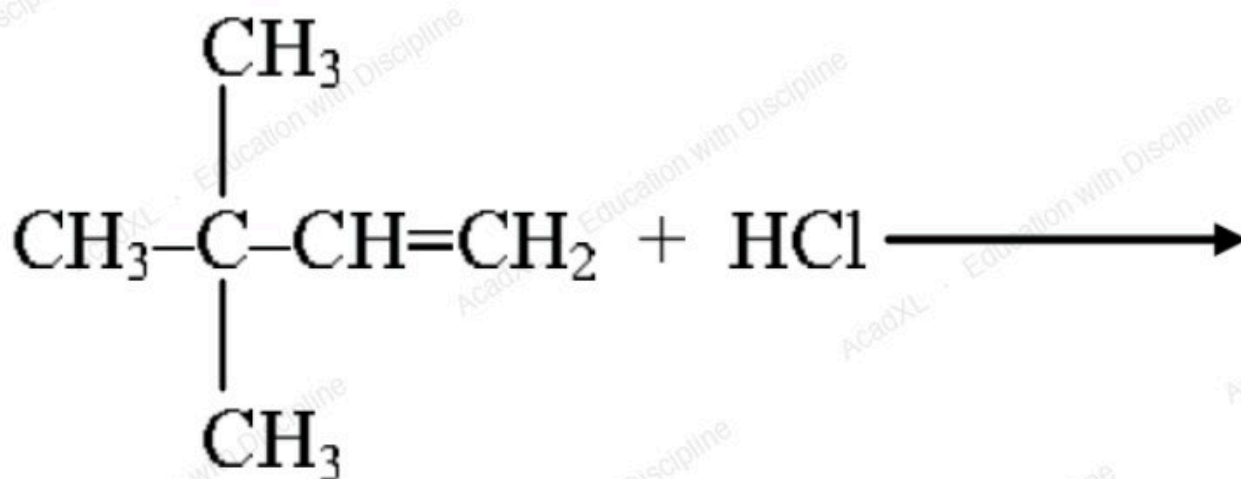
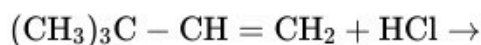
(D) $\text{AlCl}_3, \text{BF}_3, \text{NO}_2^+, \text{NH}_3$

[3 marks, -1 for a wrong answer]

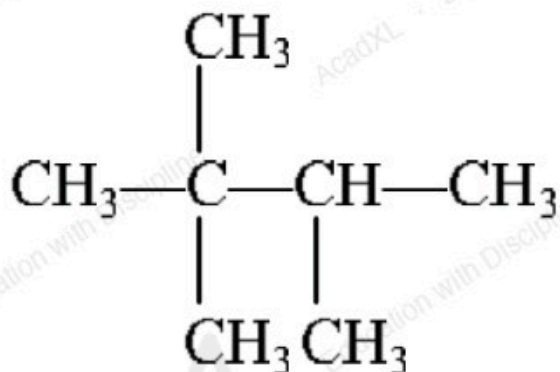
ANSWER: A

No solution stored for this question.

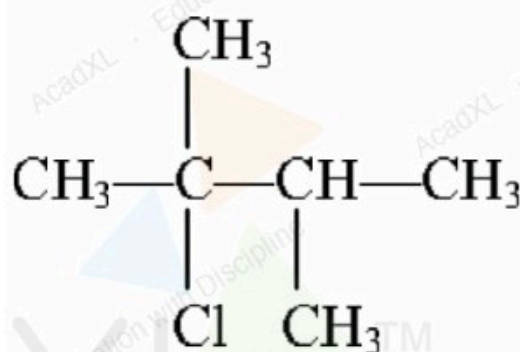
11. What is the major product that will be formed in the following reaction?



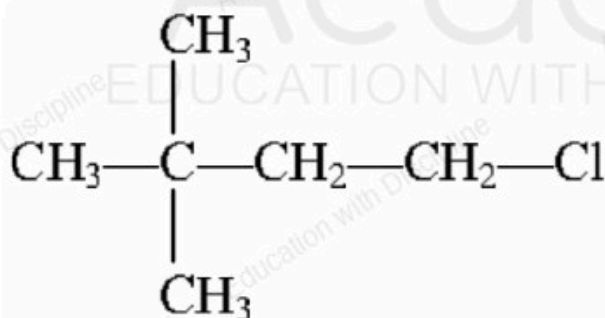
(A)



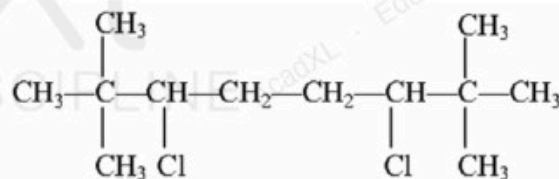
(B)



(C)



(D)



[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

12. A nucleus with the following characteristics is NOT NMR active

- (A) even mass number and even atomic number (B) odd mass number and even or odd atomic number
(C) even mass number and odd atomic number (D) None of these

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

13. The specific rotation of an optically active compound is dependent on

- (A) concentration of the sample (B) path length
(C) wavelength of the circularly polarized light (D) all of the above

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

14. For cyclohexane, which of the following factors does not make the boat conformation less stable than the chair conformation

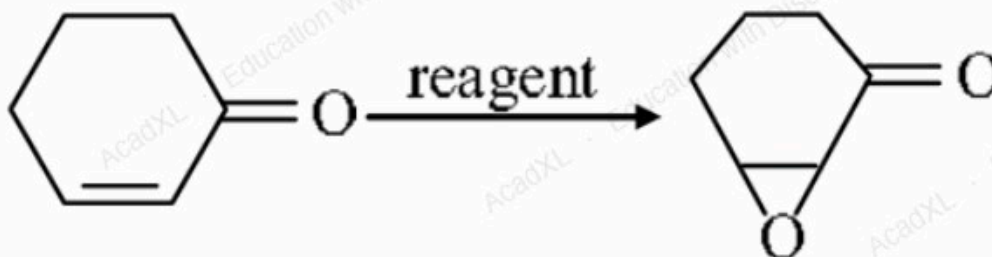
- (A) 1,3-diaxial interactions (B) flag pole interactions
(C) angle strain (D) torsional strain

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

15. Suggest the suitable reagent for the following transformation (cyclohex-2-en-1-one to the corresponding 2,3-epoxy ketone).



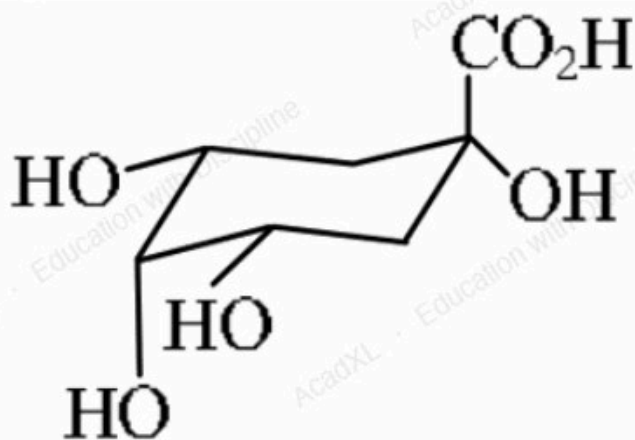
- (A) meta-chloroperoxybenzoic acid (B) ozone
(C) potassium dichromate (D) alkaline hydrogen peroxide

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

16. The following molecule has a



(A) centre of symmetry

(B) plane of symmetry

(C) axis of symmetry

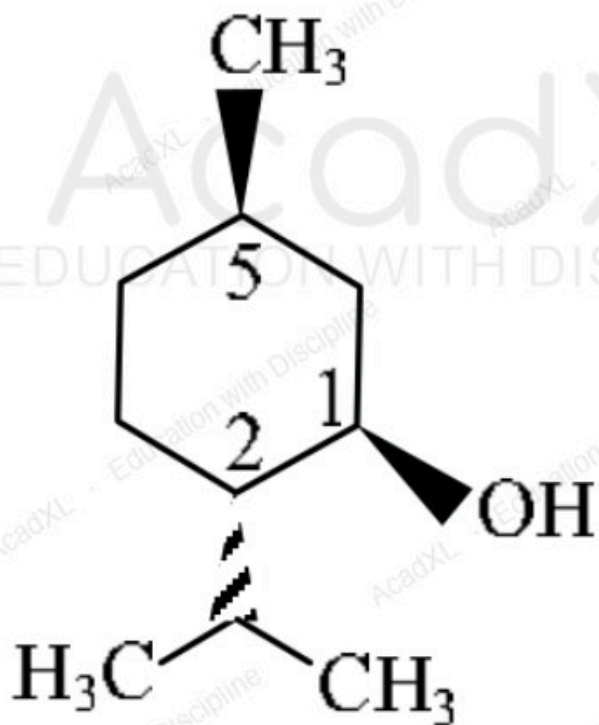
(D) none of the above

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

17. The absolute configurations of the chiral centres 1, 2 and 5 in the following molecule are



(A) 1R, 2R, 5R

(B) 1S, 2S, 5S

(C) 1R, 2S, 5R

(D) 1S, 2R, 5S

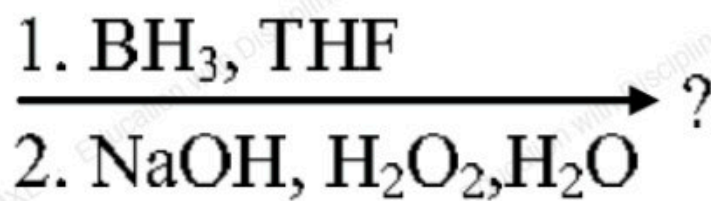
[3 marks, -1 for a wrong answer]

ANSWER: C

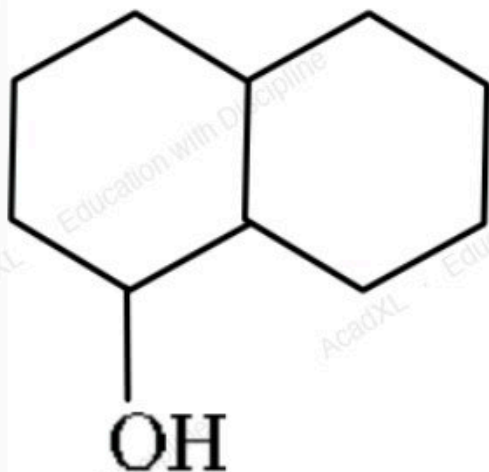
No solution stored for this question.

18. The major product in the following reaction is (octahydronaphthalene alkene treated with 1. BH_3 , THF

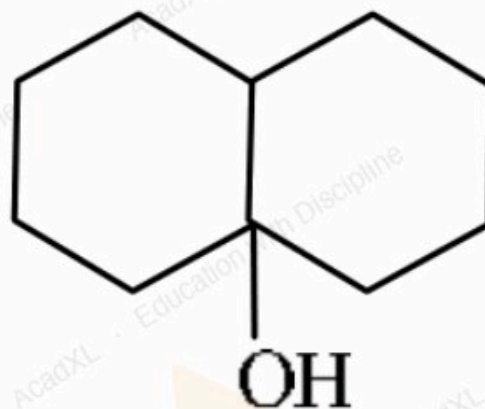
2. NaOH , H_2O_2 , H_2O)



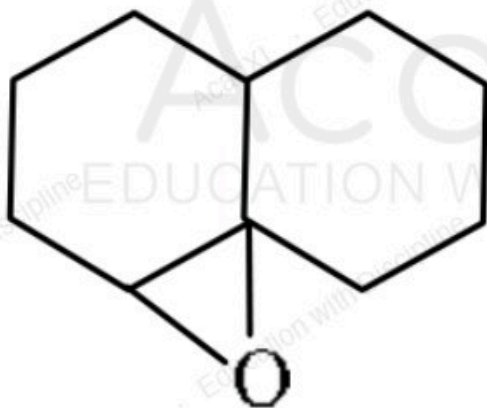
(A)



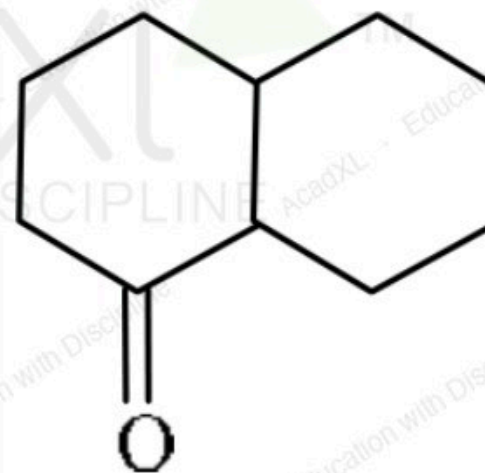
(B)



(C)



(D)

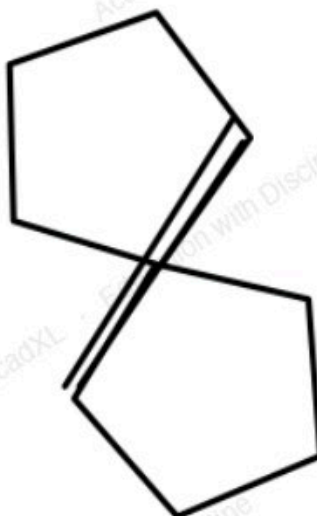
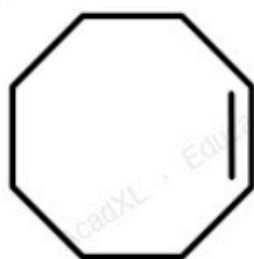


[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

19. The following structures are



(A) enantiomers

(B) identical

(C) diastereomers

(D) rotamers

[3 marks, -1 for a wrong answer]

ANSWER: C

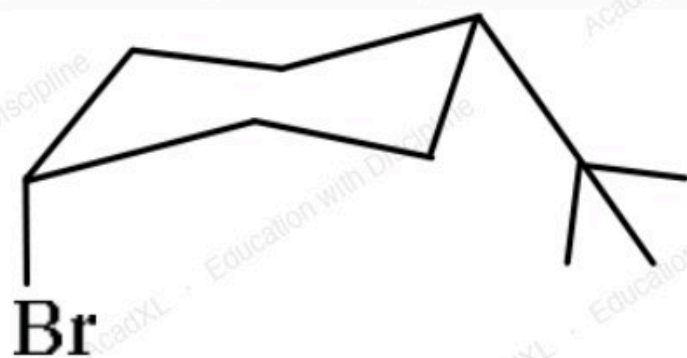
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AcadXL

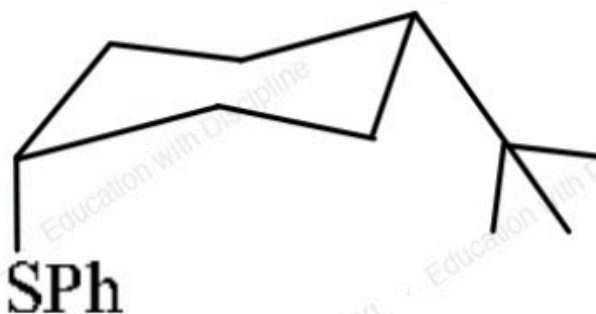
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TM

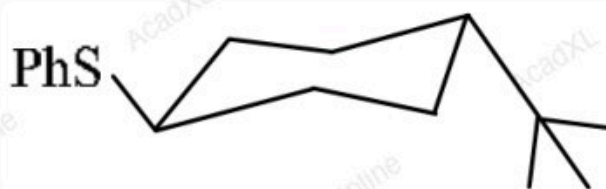
20. The major product in the following reaction is (a cyclohexyl bromide treated with PhSNa)



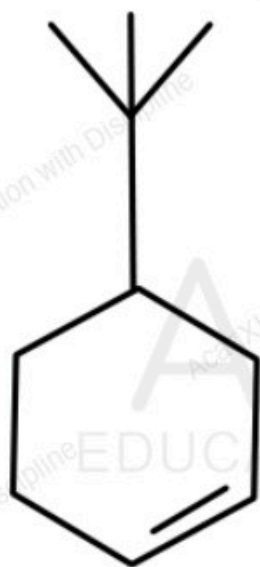
(A)



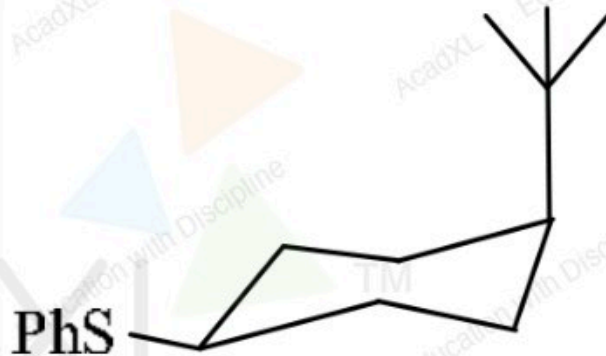
(B)



(C)



(D)

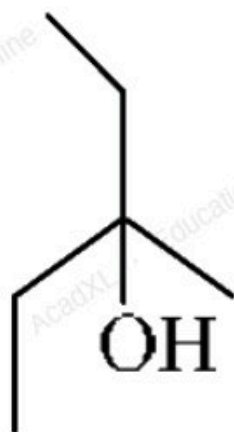


[3 marks, -1 for a wrong answer]

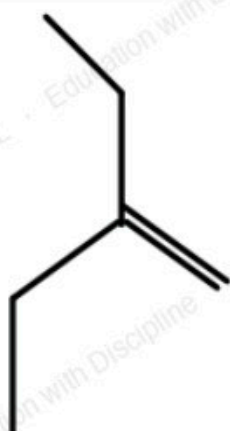
ANSWER: B

No solution stored for this question.

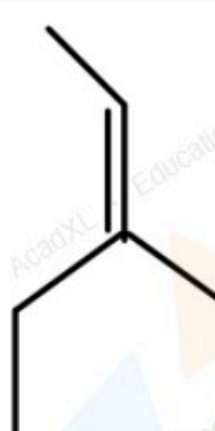
21. Identify the alkene which will NOT provide the following alcohol upon oxymercuration-demercuration.



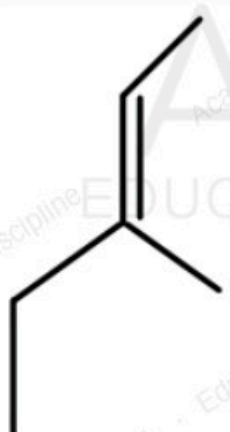
(A)



(B)



(C)



(D)



[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

22. If the energy of a reaction is twice RT , its rate constant k is related to frequency factor A by the relation:

(A) $k = 0.135 A$

(B) $k = 1.35 A$

(C) $k = 0.0135 A$

(D) $k = 2.303 A$

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

23. A solution of urea was found to be isotonic with a solution of salt XY of molecular weight 74.6. If 0.15 moles of urea are dissolved in a certain volume V mL of the isotonic solution, the amount of salt in the solution will be

(A) 22.4 g

(B) 5.6 g

(C) 11.2 g

(D) 7.46 g

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

24. The pH of 0.1 M NH_4OH ($K_b = 1.8 \times 10^{-5}$) is

(A) 1

(B) 13

(C) 5.7

(D) 11.1

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

25. The pH of mixture of 100 mL of 0.25 N HCl and 100 mL of 0.125 N NaOH is

(A) 1.20

(B) 0.90

(C) 0.70

(D) 0.42

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

26. For the reaction $P + Q \rightarrow R$ the following data was obtained. Set I: $[P] = 0.125 \text{ M}$, $[Q] = 0.250 \text{ M}$, Rate = 0.01; Set II: $[P] = 0.250 \text{ M}$, $[Q] = 0.250 \text{ M}$, Rate = 0.04; Set III: $[P] = 0.250 \text{ M}$, $[Q] = 1.00 \text{ M}$, Rate = 0.08. The order of reaction is

- (A) 1 (B) 2
(C) 3 (D) 2.5

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

27. At a given temperature the equilibrium constants of the gaseous reactions $\text{NO}_{(g)} + \frac{1}{2}\text{O}_2 \rightleftharpoons \text{NO}_{2(g)}$ (K_1) and $2\text{NO}_{2(g)} \rightleftharpoons 2\text{NO}_{(g)} + \text{O}_{2(g)}$ (K_2) are related as

- (A) $K_1 = 2K_2$ (B) $K_1 = 1/K_2$
(C) $K_1 = \sqrt{K_2}$ (D) $K_1 = \sqrt{1} K_2$

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

28. The degrees of freedom for $\text{NH}_4\text{Cl}_{(s)} \rightleftharpoons \text{NH}_4\text{Cl}_{(g)} \rightleftharpoons \text{NH}_{3(g)} + \text{HCl}_{(g)}$ will be

- (A) 4 (B) 3
(C) 2 (D) 1

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

29. The root mean square velocity of SO_2 is equal to that of oxygen at 27°C when the temperature is

- (A) 327°C (B) 127°C
(C) 227°C (D) 600°C

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

30. The temperature of a sample of sulfur dioxide is increased from 27°C to 327°C . The average kinetic energy of the gas molecules

(A) is doubled

(B) increases by the factor $327/27$

(C) is halved

(D) remains same

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

31. A gas shows positive Joule-Thomson effect below

(A) Critical temperature

(B) Boyle temperature

(C) Transition temperature

(D) Inversion temperature

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

32. Under high pressure conditions, van der Waals' equation for a real gas reduces to

(A) $PV = RT$

(B) $PV + a/V = RT$

(C) $PV - Pb = RT$

(D) $(P + a/V^2)(V - b) = RT$

[3 marks, -1 for a wrong answer]

ANSWER: C

No solution stored for this question.

33. When an aqueous solution of Na_2SO_4 was electrolyzed, 1440 ml of hydrogen was liberated at the cathode. The volume of oxygen liberated at anode would be:

(A) 540 mL

(B) 720 mL

(C) 1440 mL

(D) 2880 mL

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

34. A reversible adiabatic expansion is an

(A) isothermal process

(B) isobaric process

(C) isentropic process

(D) isochoric process

[3 marks, -1 for a wrong answer]

ANSWER: C

No solution stored for this question.

35. The desalination of sea water involves the phenomenon of

- (A) Sedimentation (B) Distillation
(C) Precipitation (D) Reverse osmosis

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

36. CaF_2 (Mol. Wt. = 78) has a solubility of $1.6 \times 10^{-2} \text{ g dm}^{-3}$ at 293 K. The solubility product of CaF_2 is

- (A) 3.45×10^{-11} (B) 4.20×10^{-8}
(C) 2.56×10^{-4} (D) 4.69×10^{-9}

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

37. Raman's scattering of visible light is shown by

- (A) Polar molecules (B) Non-polar molecules
(C) Molecules with permanent dipole moment (D) Ions

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

38. The Bohr radius of the first orbit of hydrogen atom is $0.530 \text{ \AA}$ units. The radius of the third orbit will be

- (A) $1.06 \text{ \AA}$ (B) $4.77 \text{ \AA}$
(C) $2.12 \text{ \AA}$ (D) $1.59 \text{ \AA}$

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

39. If the bond energies are as follows (i) C-H = 413.8 kJ (ii) Cl-Cl = 238.0 kJ (iii) C-Cl = 327.2 kJ (iv) H-Cl = 429.8 kJ, the enthalpy of the reaction $\text{CH}_4 + 2\text{Cl}_2 \rightarrow \text{CH}_2\text{Cl}_2 + 2\text{HCl}$ will be

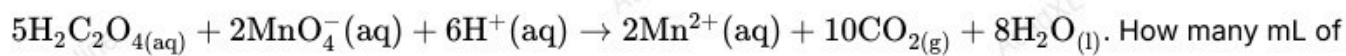
- (A) +202.6 kJ (B) -202.6 kJ
(C) +220.1 kJ (D) +870 kJ

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

40. Oxalic acid, $\text{H}_2\text{C}_2\text{O}_4$, reacts with permanganate ion according to the balanced equation given below:



How many mL of 0.0154 M KMnO_4 solution are required to react with 25.0 mL of 0.0208 M $\text{H}_2\text{C}_2\text{O}_4$ solution?

(A) 13.5 mL

(B) 18.5 mL

(C) 33.8 mL

(D) 84.4 mL

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

41. Which of these mixtures constitute buffer solutions? Mixture 1: 25 mL of 0.10 M HNO_3 and 25 mL of 0.10 M NaNO_3 . Mixture 2: 25 mL of 0.10 M $\text{HC}_2\text{H}_3\text{O}_2$ and 25 mL of 0.10 M NaOH

(A) 1 only

(B) 2 only

(C) both 1 and 2

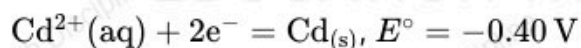
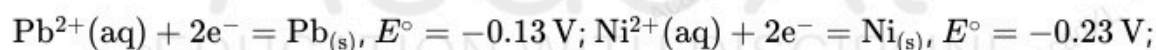
(D) neither 1 nor 2

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

42. Nickel metal is added to a solution containing 1.0 M $\text{Pb}^{2+}(\text{aq})$ and 1.0 M $\text{Cd}^{2+}(\text{aq})$. Use the standard reduction potential to determine which of the following reaction(s) will occur. Reaction 1: $\text{Ni}_{(\text{s})} + \text{Pb}^{2+}(\text{aq}) \rightarrow \text{Pb}_{(\text{s})} + \text{Ni}^{2+}(\text{aq})$. Reaction 2: $\text{Ni}_{(\text{s})} + \text{Cd}^{2+}(\text{aq}) \rightarrow \text{Cd}_{(\text{s})} + \text{Ni}^{2+}(\text{aq})$. Given:



(A) 1 only

(B) 2 only

(C) both 1 and 2

(D) neither 1 nor 2

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

43. An electrochemical cell constructed for the reaction: $\text{Cu}^{2+}(\text{aq}) + \text{M}_{(\text{s})} \rightarrow \text{Cu}_{(\text{s})} + \text{M}^{2+}(\text{aq})$ has an $E^\circ = 0.75 \text{ V}$. The standard reduction potential for $\text{Cu}^{2+}(\text{aq})$ is 0.34 V . What is the standard reduction potential for $\text{M}^{2+}(\text{aq})$?

- (A) 1.09 V (B) 0.410 V
(C) -0.410 V (D) -1.09 V

[3 marks, -1 for a wrong answer]

ANSWER: C

No solution stored for this question.

44. A 0.200 g sample of benzoic acid, $\text{C}_6\text{H}_5\text{COOH}$, is titrated with a $0.120 \text{ M Ba}(\text{OH})_2$ solution. What volume of the $\text{Ba}(\text{OH})_2$ solution is required to reach the equivalence point? [$\text{C}_6\text{H}_5\text{COOH}$, Molar Mass = $122.1 \text{ g}\cdot\text{mol}^{-1}$]

- (A) 6.82 mL (B) 13.6 mL
(C) 17.6 mL (D) 35.2 mL

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

45. The amount of sodium hydrogen carbonate, NaHCO_3 , in an antacid tablet is to be determined by dissolving the tablet in water and then titrating the resulting solution with hydrochloric acid. Which indicator is the most appropriate for this titration? Given K_a values: $\text{H}_2\text{CO}_3 = 2.5 \times 10^{-4}$, $\text{HCO}_3^- = 2.4 \times 10^{-8}$

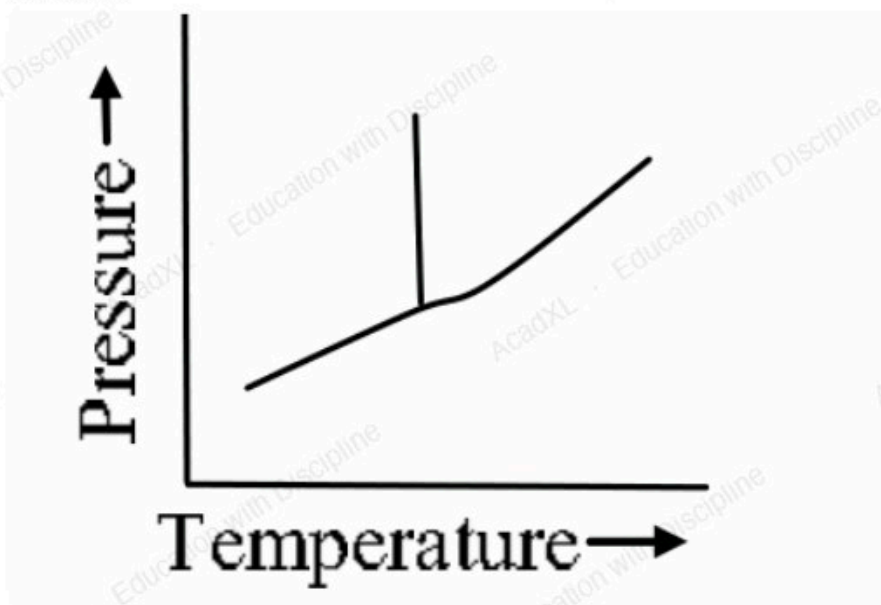
- (A) methyl orange, $\text{p}K_{\text{in}} = 3.7$ (B) bromothymol blue, $\text{p}K_{\text{in}} = 7.0$
(C) phenolphthalein, $\text{p}K_{\text{in}} = 9.3$ (D) alizarin yellow, $\text{p}K_{\text{in}} = 12.5$

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

46. According to this phase diagram, which phases can exist at pressures lower than the triple point pressure?



- (A) gas only
(B) solid and gas only
(C) liquid only
(D) solid and liquid only

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

47. What is the Na^+ ion concentration in the solution formed by mixing 20 mL of 0.10 M Na_2SO_4 solution with 50 mL of 0.30 M Na_3PO_4 solution?

- (A) 0.15 M
(B) 0.24 M
(C) 0.48
(D) 0.70

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

48. Ultra violet light absorption occurring in protein is due to the presence of

- (A) Alanine
(B) Cysteine
(C) Glutamic acid
(D) Tryptophan

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

49. The amino acid proline allows bending of a polypeptide in secondary structure of protein. This is possible due to

- (A) Presence of peptide bond
- (B) Absence of hydrogen bond
- (C) Presence of hydrogen bond
- (D) Steric hindrance

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

50. Which of the amino acid stabilizes tertiary structure of protein through formation of covalent bond?

- (A) Tyrosine
- (B) Methionine
- (C) Cysteine
- (D) Valine

[3 marks, -1 for a wrong answer]

ANSWER: C

No solution stored for this question.

51. Reversible binding of oxygen occurs through

- (A) Fe
- (B) Cu
- (C) Mg
- (D) Ca

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

52. A mixture of three amino acids glycine (Gly), lysine (Lys) and glutamic acid (Glu) was separated by an anion exchange chromatography process. The order of elution of amino acids from the column is

- (A) Glu, Lys, Gly
- (B) Lys, Glu, Gly
- (C) Gly, Lys, Glu
- (D) Glu, Gly, Lys

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

53. The negative charge of the cell membrane is due to presence of

- (A) Phospholipid
- (B) Protein
- (C) Glycolipid
- (D) Glycoprotein

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

54. Ten DNA molecules undergo replication 2 times. The total number DNA molecules produced are

- (A) 10 (B) 20
(C) 30 (D) 40

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

55. Enzymatic hydrolysis of starch leads to release of

- (A) Fructose (B) Mannose
(C) Glucose (D) Xylose

[3 marks, -1 for a wrong answer]

ANSWER: C

No solution stored for this question.

56. The template on which protein synthesis occurs during translation is

- (A) Protein (B) m RNA
(C) DNA (D) t RNA

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

57. The biomolecule which does not have a secondary structure is

- (A) Lipid (B) Protein
(C) DNA (D) RNA

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

58. A currency counting machine counts 60 million notes per day. A bank has as many notes as number of oxygen atoms in 24.8 g of $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ (M.W. = 248). How many days would be required to count these notes?

- (A) 9.33×10^{17} (B) 7.03×10^{10}
(C) 8.03×10^{15} (D) 6.66×10^{-12}

[3 marks, -1 for a wrong answer]

ANSWER: C

No solution stored for this question.

59. What volume of water should be added to 1600 mL of a 0.205 N solution so that the resulting solution will be 0.2 N?

(A) 40 mL

(B) 50 mL

(C) 100 mL

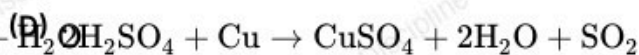
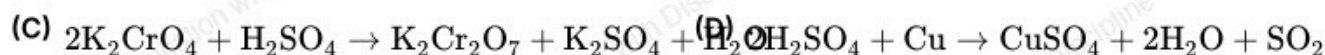
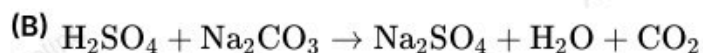
(D) 20 mL

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

60. Which of the following equations represented an oxidation-reduction reaction?



[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

61. Sapphire is a mineral of

(A) Cu

(B) Zn

(C) Al

(D) Mg

[3 marks, -1 for a wrong answer]

ANSWER: C

No solution stored for this question.

62. Which of these ion is expected to be colored in aqueous solution? [I] Fe^{3+} [II] Zn^{2+} [III] Al^{3+} [IV]

Sc^{3+}

(A) [I] only

(B) [III] only

(C) [I] and [II] only

(D) [I], [II] and [III]

[3 marks, -1 for a wrong answer]

ANSWER: A

No solution stored for this question.

63. How many unpaired electrons are in a Fe^{2+} ion in the ground state?

- (A) 0 (B) 2
(C) 4 (D) 6

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

64. For the atoms Li, Be, B and Na, the correct order of increasing atomic radius is:

- (A) B, Be, Li, Na (B) Li, Be, B, Na
(C) Be, Li, B, Na (D) Be, B, Li, Na

[3 marks, -1 for a wrong answer]

ANSWER: C

No solution stored for this question.

65. How many nearest neighbors surround each ion in a face-centered cubic lattice of an ionic crystal?

- (A) 4 (B) 6
(C) 8 (D) 12

[3 marks, -1 for a wrong answer]

ANSWER: C

No solution stored for this question.

66. Methyl-t-butyl ether, $\text{C}_5\text{H}_{12}\text{O}$, is added to gasoline to promote cleaner burning. How many moles of oxygen gas, O_2 are required to burn 1.0 mol of this compound completely to form carbon dioxide and water?

- (A) 4.5 mol (B) 6.0 mol
(C) 7.5 mol (D) 8.0 mol

[3 marks, -1 for a wrong answer]

ANSWER: C

No solution stored for this question.

67. 1 mL of concentrated aqueous ammonia is added dropwise to 1 mL of a dilute aqueous solution of Cu(II). What observations can be made during this process?

- (A) The colorless Cu(II) nitrate solution turns blue and yields a dark blue precipitate
- (B) The colorless copper (II) nitrate solution yields a white precipitate which turns dark blue upon standing.
- (C) The light blue copper (II) nitrate solution yields a white precipitate which redissolves to form a dark blue solution.
- (D) The light blue copper (II) nitrate solution turns dark

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

68. Two white solids, lead (II) chloride and silver chloride can be distinguished from each other by -

- (A) adding cold water to each: the silver chloride will dissolve.
- (B) adding hot water to each: the lead (II) chloride will dissolve.
- (C) adding sodium chloride solution to each: the lead (II) chloride will become warm and release chlorine gas.
- (D) adding zinc chloride solution to each: the silver chloride will change to metallic silver.

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

69. A catalyst speeds up a chemical reaction by

- (A) shifting the equilibrium
- (B) increasing the activation energy
- (C) initiating the reaction
- (D) decreasing energy of activation

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

70. Evidence for the electron arrangement in atoms has been obtained primarily from the study of

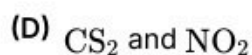
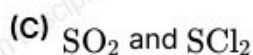
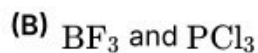
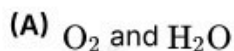
- (A) isotopes
- (B) radioactivity
- (C) stoichiometry
- (D) atomic spectra

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

71. In which of the following pairs are both molecules polar?

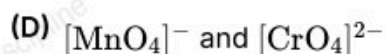
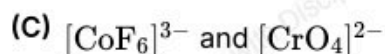
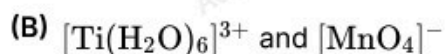
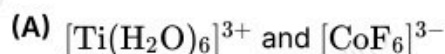


[3 marks, -1 for a wrong answer]

ANSWER: C

No solution stored for this question.

72. In which of the following transition metal ion complexes, the colour is not due to d-d transition?



[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

73. The hydrated salt $Na_2SO_4 \cdot nH_2O$ loses all water of crystallization on heating and is reduced to 44.1% of its original weight. Therefore, the value n is

(A) 5

(B) 10

(C) 6

(D) 7

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

74. A match box exhibits

(A) Cubic geometry

(B) Monoclinic geometry

(C) Tetragonal geometry

(D) Orthorhombic geometry

[3 marks, -1 for a wrong answer]

ANSWER: D

No solution stored for this question.

75. The noble gas was first time discovered by

(A) Cavendish

(B) William Ramsay

(C) Rayleigh

(D) Frankland

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

76. The maximum possible number of hydrogen bonds a water molecule can form is

- (A) 2 (B) 4
(C) 3 (D) 1

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

77. CuSO_4 reacts with KCN to form water insoluble CuCN. This insoluble precipitate dissolves in excess of KCN, due to formation of the following complex

- (A) $\text{K}_2[\text{Cu}(\text{CN})_4]$ (B) $\text{K}_3[\text{Cu}(\text{CN})_4]$
(C) $\text{Cu}(\text{CN})_2$ (D) $\text{Cu}[\text{KCu}(\text{CN})_4]$

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

78. An impossible arrangement of the set of quantum numbers is:

- (A) $n = 3, \ell = 2, m = -2, s = 1/2$ (B) $n = 4, \ell = 0, m = 0, s = 1/2$
(C) $n = 3, \ell = 2, m = -3, s = 1/2$ (D) $n = 1, \ell = 0, m = 0, s = -1/2$

[3 marks, -1 for a wrong answer]

ANSWER: C

No solution stored for this question.

79. Which of the following has the highest bond order?

- (A) O_2 (B) O_2^+
(C) O_2^- (D) O_2^{2-}

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

80. The simplest formula of a compound containing 50% of element 'A' (Atomic weight = 10) and 50% of element 'B' (Atomic weight = 20) is

(A) AB

(B) A_2B

(C) A_2B_2

(D) A_2B_3

[3 marks, -1 for a wrong answer]

ANSWER: B

No solution stored for this question.

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Answer key

1. B	2. B	3. A	4. B	5. A	6. C
7. D	8. C	9. A	10. A	11. B	12. A
13. D	14. A	15. D	16. B	17. C	18. A
19. C	20. B	21. D	22. A	23. B	24. D
25. A	26. D	27. D	28. D	29. A	30. A
31. D	32. C	33. B	34. C	35. D	36. A
37. B	38. B	39. B	40. D	41. D	42. A
43. C	44. A	45. A	46. B	47. D	48. D
49. B	50. C	51. A	52. D	53. A	54. D
55. C	56. B	57. A	58. C	59. A	60. D
61. C	62. A	63. D	64. C	65. C	66. C
67. D	68. B	69. D	70. D	71. C	72. D
73. B	74. D	75. B	76. B	77. B	78. C
79. B	80. B				

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