

Chemistry



1. Elements X and Y combine to form two compounds XY and X₂Y. Find the atomic weight of X and Y, if the weight of 0.1 moles of XY is 10g and 0.05 moles of X₂Y is 9g

- (a) 30, 20
- (b) 80, 20
- (c) 60, 40
- (d) 20, 30

Answer: (b)

2. Which one will have maximum numbers of water molecules?

- (a) 18 molecules of water
- (b) 1.8 grams of water
- (c) 18 grams of water
- (d) 18 moles of water

Answer: (d)

3. The number of atoms present in 0.1 moles of a triatomic gas is

- (a) 1.806×10^{23}
- (b) 1.806×10^{22}
- (c) 3.600×10^{23}
- (d) 6.026×10^{22}

Answer: (a)

4. Find the volume of O₂ required to burn 1 L of propane completely, measured at 0°C temperature and 1 atm pressure

- (a) 10 L

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(b) 7 L

(c) 6 L

(d) 5 L

Answer: (d)

5. A gas X has C_p and C_v ratio as 1.4, at NTP 11.2 L of gas X will contain _____ number of atoms

(a) 1.2×10^{23}

(b) 3.01×10^{23}

(c) 2.01×10^{23}

(d) 6.02×10^{23}

Answer: (d)

6. Which of the species is not paramagnetic?

(a) As^+

(b) Cl^-

(c) Ne^{2+}

(d) Be^+

Answer: (b)

7. Pressure has the same dimension as _____

(a) energy per unit volume

(b) energy

(c) force per unit volume

(d) force

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Answer: (a)

8. A container has an equal mass of H_2 , O_2 and CH_4 at $27^\circ C$, the ratio of their volume is

(a) 16:8:1

(b) 8:1:2

(c) 16:1:2

(d) 8:16:1

Answer: (c)

9. There are two chlorides of sulphur S_2Cl_2 and SCl_2 . What is the equivalent mass of S in SCl_2

(a) 64.8 g/mole

(b) 32 g/mole

(c) 16 g/mole

(d) 8 g/mole

Answer: (c)

10. Boron exists as two stable isotopes; ^{10}B (19%) and ^{11}B (81%). Find out the average atomic weight of boron in the periodic table

(a) 10.0

(b) 11.2

(c) 10.2

(d) 10.8

Answer: (d)

11. Which is the best-suited method for the separation of para and ortho-nitrophenols from 1:1 mixture?

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- (a) crystallisation
- (b) chromatography
- (c) sublimation
- (d) steam distillation

Answer: (d)

12. Find the incorrect statement for a nucleophile

- (a) A nucleophile is a Lewis acid
- (b) Nucleophiles do not seek electron
- (c) Ammonia is a nucleophile
- (d) Nucleophiles attack low electron density sites

Answer: (a)

13. Which among the following is the most deactivating meta-directing group in aromatic substitution reaction?

- (a) $-\text{COOH}$
- (b) $-\text{SO}_3\text{H}$
- (c) $-\text{NO}_2$
- (d) $-\text{CN}$

Answer: (c)

14. Ammonia evolved from 0.75 g of the soil sample in the Kjeldahl's method for nitrogen estimation, neutralises 10 ml of 1M H_2SO_4 . Find the percentage of nitrogen present in the soil

- (a) 35.33
- (b) 37.33

(c) 43.33

(d) 45.33

Answer: (b)

15. The correct order of increasing nucleophilicity is

(a) $\text{Cl}^- < \text{Br}^- < \text{I}^-$

(b) $\text{Br}^- < \text{Cl}^- < \text{I}^-$

(c) $\text{I}^- < \text{Br}^- < \text{Cl}^-$

(d) $\text{I}^- < \text{Cl}^- < \text{Br}^-$

Answer: (a)

16. Homologous series of alkanols have a general formula

(a) $\text{C}_n\text{H}_{2n}\text{O}_2$

(b) $\text{C}_n\text{H}_{2n}\text{O}$

(c) $\text{C}_n\text{H}_{2n+1}\text{O}$

(d) $\text{C}_n\text{H}_{2n+2}\text{O}$

Answer: (d)

17. Find the compound which undergoes nucleophilic substitution reaction exclusively by an $\text{S}_\text{N}1$ mechanism

(a) Benzyl chloride

(b) Chlorobenzene

(c) Ethyl chloride

(d) Isopropyl chloride

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Answer: (a)

18. Which of the following methods is best suited for the separation of a mixture containing naphthalene and benzoic acid

- (a) Crystallisation
- (b) Chromatography
- (c) Sublimation
- (d) Distillation

Answer: (c)

19. How many structural isomers are possible if one hydrogen in diphenylmethane is replaced by chlorine?

- (a) 8
- (b) 4
- (c) 7
- (d) 6

Answer: (b)

20. Why do we boil the extract with conc. HNO_3 in Lassaigne's test for halogens?

- (a) to increase the concentration of NO_3^- ions
- (b) to increase the solubility product of AgCl
- (c) it increases the precipitation of AgCl
- (d) for the decomposition of Na_2S and NaCN formed

Answer: (d)

21. Photochemical smog normally does not contain

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- (a) Chlorofluorocarbons
- (b) Peroxyacetyl nitrate
- (c) Ozone
- (d) Acrolein

Answer: (a)

22. Depletion of the ozone layer is caused due to

- (a) Ferrocene
- (b) Fullerenes
- (c) Freons
- (d) Polyhalogens

Answer: (c)

23. Find the incorrect statement

- (a) BOD value of clean water is less than 5 ppm
- (b) Drinking water pH should be between 5.5-9.5
- (c) carbon, sulphur and nitrogen oxides are the most widespread air pollutants
- (d) dissolved oxygen concentration below 5 ppm is ideal for the growth of fish

Answer: (d)

24. Find the secondary pollutant among these

- (a) PAN
- (b) N₂O
- (c) SO₂

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(d) CO₂

Answer: (a)

25. The reaction responsible for the radiant energy of the Sun is

(a) nuclear fission

(b) nuclear fusion

(c) chemical reaction

(d) combustion

Answer: (b)

26. C-O bond length is minimum in

(a) CO₂

(b) CO₃²⁻

(c) HCOO⁻

(d) CO

Answer: (d)

27. Molecules are held together in a crystal by

(a) hydrogen bond

(b) electrostatic attraction

(c) Van der Waal's attraction

(d) dipole-dipole attraction

Answer: (c)

28. Sp³d² hybridization is present in [Co(NH₃)₆]³⁺, find its geometry

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- (a) octahedral geometry
- (b) square planar geometry
- (c) tetragonal geometry
- (d) tetrahedral geometry

Answer: (a)

29. Find the molecule with the maximum dipole moment

- (a) CH₄
- (b) NH₃
- (c) CO₂
- (d) NF₃

Answer: (b)

30. MX₆ is a molecule with octahedral geometry. How many X – M – X bonds are at 180°?

- (a) four
- (b) two
- (c) three
- (d) six

Answer: (c)

31. Find the successive elements of the periodic table with ionisation energies, 2372, 520 and 890 kJ per mol respectively

- (a) Li, Be, B
- (b) H, He, Li
- (c) B, C, N

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(d) He, Li, Be

Answer: (d)

32. In the modern periodic table, the number of period of the element is the same as

(a) principal quantum number

(b) atomic number

(c) azimuthal quantum number

(d) atomic mass

Answer: (a)

33. The correct order for the size of I , I^+ , I^- is

(a) $I > I^- > I^+$

(b) $I > I^+ > I^-$

(c) $I^- > I > I^+$

(d) $I^+ > I^- > I$

Answer: (c)

34. For the same value of n , the penetration power of orbital follows the order

(a) $s = p = d = f$

(b) $p > s > d > f$

(c) $f < d < p < s$

(d) $s < p < d < f$

Answer: (c)

35. Which of the reactions will need the maximum amount of energy?

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- (a) $\text{Na} \rightarrow \text{Na}^+ + \text{e}^-$
- (b) $\text{Ca}^+ \rightarrow \text{Ca}^{++} + \text{e}^-$
- (c) $\text{K}^+ \rightarrow \text{K}^{++} + \text{e}^-$
- (d) $\text{C}^{2+} \rightarrow \text{C}^{3+} + \text{e}^-$

Answer: (c)

36. Find the pH of a solution when 0.01 M HCl and 0.1 M NaOH are mixed in equal volumes

- (a) 12.65
- (b) 1.04
- (c) 7.0
- (d) 2.0

Answer: (a)

37. Which of the following aqueous solution will be the best conductor of electricity?

- (a) NH_3
- (b) CH_3COOH
- (c) HCl
- (d) $\text{C}_6\text{H}_{12}\text{O}_6$

Answer: (c)

38. In 0.10 M aqueous solution of pyridine ($\text{C}_5\text{H}_5\text{N}$), find the percentage of pyridine that forms pyridinium ion ($\text{C}_5\text{H}_5\text{N}^+\text{H}$) (K_b for $\text{C}_5\text{H}_5\text{N} = 1.7 \times 10^{-9}$)

- (a) 1.6%
- (b) 0.77%

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(c) 0.0060%

(d) 0.013%

Answer: (d)

39. If the equilibrium constant for the following reactions are given

(a) K_2K_3/K_1

(b) K_1K_{33}/K_2

(c) K_2K_{33}/K_1

(d) K_2K_3/K_1

Answer: (c)

40. Highest pH will be recorded for which of the following solutions if they are equimolar

(a) $AlCl_3$

(b) $BaCl_2$

(c) $BeCl_2$

(d) $LiCl$

Answer: (b)

41. How many orbitals can have the following set of quantum numbers, $n = 3, l = 1, m_l = 0$?

(a) 3

(b) 1

(c) 4

(d) 2

Answer: (b)

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42. Electronic configuration of the outer shell of the element Gd with atomic number 64 is

- (a) $4f^4 5d^5 6s^1$
- (b) $4f^3 5d^5 6s^2$
- (c) $4f^5 5d^4 6s^1$
- (d) $4f^7 5d^1 6s^2$

Answer: (d)

43. Maximum number of electrons in a subshell can be

- (a) $4l + 2$
- (b) $4l - 2$
- (c) $2n^2$
- (d) $2l + 1$

Answer: (a)

44. The orientation of atomic orbitals depends on their

- (a) spin quantum number
- (b) magnetic quantum number
- (c) azimuthal quantum number
- (d) principal quantum number

Answer: (b)

45. A gas X has C_p and C_v ratio as 1.4, at NTP 11.2 L of gas X will contain _____ number of atoms

- (a) 1.2×10^{23}
- (b) 3.01×10^{23}

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(c) 2.01×10^{23}

(d) 6.02×10^{23}

Answer: (d)

46. Photochemical smog normally does not contain

(a) Chlorofluorocarbons

(b) Peroxyacetyl nitrate

(c) Ozone

(d) Acrolein

Answer: (a)

47. Depletion of the ozone layer is caused due to

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Answer: (c)

48. Find the incorrect statement

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49. Find the secondary pollutant among these

- (a) PAN
- (b) N₂O
- (c) SO₂
- (d) CO₂

Answer: (a)

50. The reaction responsible for the radiant energy of the Sun is

- (a) nuclear fission
- (b) nuclear fusion
- (c) chemical reaction
- (d) combustion

Answer: (b)