

JEE Main 31 January 2024 Shift 2 Answer Key

Chemistry

Q.1: Find out the final product C for the reaction:

$\text{CH}_3\text{--CH}_2\text{--CH}_2\text{--Br} \rightarrow$ (in presence of alcoholic KOH, heat) \rightarrow Product A

Product A \rightarrow (in presence of HBr) \rightarrow Product B

Product B \rightarrow (in presence of aqueous KOH) \rightarrow Product C

A.1: Propan-2-ol

Q.2: Which of the following options contain amphoteric oxide(s) only?

i. SnO_2 and SiO

ii. SiO_2

iii. SnO_2 and PbO_2

iv. CO and SiO_2

A.2: SnO_2 and PbO_2

Q.3: How many of the following compounds have sp^3 hybridized central atom?

H_2O , NH_3 , SiO_2 , SO_2 , CO and BF_3

A.3: 3 or 4

Q.4: Which of the following compounds is white in colour?

i. ZnSO_4

ii. CuSO_4

iii. FeSO_4

iv. FeCl_3

A.4: ZnSO_4

Q.5: On which of the following factors does the electrical conductivity of an electrolytic cell does not depend?

i. Concentration of electrolyte

- ii. Amount of electrolyte added
- iii. Temperature
- iv. Nature of electrode

A.5: Nature of Electrode

Q.6: Arrange the following elements (magnitude only) in the decreasing order of electron gain enthalpy.

Sulphur - A, Bromine - B, Fluorine - C, Argon - D

A.6: $C > B > A > D$

Q.7: Moles of CH_4 required for formation of 22 g of CO_2 is $m \times 10^{-2}$. Find the value of m.

A.7: 50 mole

Q.8: Find the total number of different alkanes formed when the following mixture is subjected to electrolysis (do not consider disproportionation reaction):

CH_3COONa (aq) and $\text{C}_2\text{H}_5\text{COONa}$ (aq)

A.8: C_2H_5

Q.9: How many of the following compounds have sp^3 hybridized central atom?

BF_3 , BeCl_2 , NH_3 , CH_4 , H_2O , SO_2 , CO_2

A.9: 3

Q.10: If one faraday of electricity is used in the discharging of Cu^{2+} , then find the mass (in grams) of Cu deposited. (Round off the answer to the nearest integer.)

A.10: 32

Q.11: The spin-only magnetic moment of complex ion $[\text{Ni}(\text{NH}_3)_6]^{2+}$ is $A \times 10^{-1}$ BM. Find the value of A.

A.11: 28

Q.12: Which of the following solutions shows a positive deviation from Raoult's law?

- i. $\text{CHCl}_3 + \text{C}_6\text{H}_6$
- ii. $\text{CH}_3\text{COCH}_3 + \text{CS}_2$
- iii. $\text{CH}_3\text{COCH}_3 + \text{CHCl}_3$
- iv. $\text{CH}_3\text{COCH}_3 + \text{C}_6\text{H}_5\text{NH}_2$

A.12: $\text{CH}_3\text{COCH}_3 + \text{CS}_2$

Q.13: Species having carbon with a sextet of valence electrons and acting as an electrophile is?

- i. Carbanion
- ii. Carbocation
- iii. Free Radical
- iv. Nitrene

A.13: $\text{CH}_3\text{COCH}_3 + \text{CS}_2$

Q.14: Assertion (A): Noble gases have very high boiling points.

Reason(R): Noble gases have strong dispersion forces. Hence, they liquefy at low temperatures and hence they have a high boiling point.

- i. Both A and R are true and R is the correct explanation of A.
- ii. Both A and R are true and R is not the correct explanation of A.
- iii. Both A and R are false.
- iv. A is true but R is false.

A.14: Both A and R are false.

Q.15: How many of the following statements are true?

- (i) Chromate ion is square planar.
- (ii) Green manganate ion is diamagnetic.
- (iii) Dichromate can be prepared using chromate.
- (iv) Dark green KMnO_4 disproportionates in acidic medium and neutral medium.
- (v) For d-block elements, ionic character decreases for increasing oxidation number of metal in oxides.

A.15: 2

Q.16: Assertion: The pK value of phenol is 10.0 while that of ethanol is 15.9.

Reason: Ethanol is a stronger acid than phenol.

- i. Both A and R are true and R is the correct explanation of A.
- ii. Both A and R are true and R is not the correct explanation of A.
- iii. Both A and R are false.
- iv. A is true but R is false.

A.16: A is true but R is false.

Q.17: The adsorption principle is used in

- i. Distillation
- ii. Differential Extraction
- iii. Chromatography
- iv. Vacuum Distillation

A.17: Chromatography

Q.18: How many of the following can be used as electrodes in batteries?

- (i) Zinc
- (ii) Zinc - Mercury amalgam
- (iii) Lead
- (iv) Graphite

A.18: Zinc - Mercury amalgam

A.19: If the energy of radiation having a wavelength of 242 nm is $X \times 10^{-19}$, then find the nearest integer value of X. Given: Planck's constant = 6.6×10^{-34} Js and $c = 3 \times 10^8$ m/s.

A.19: 8