



CHEMISTRY

BOOKS - AIIMS PREVIOUS YEAR PAPERS

AIIMS 2017

Chemistry

1. Sodium metal crystallises in a body centred cubic lattice with edge length of the unit cell equal to 4.29\AA . The radius of the sodium atom is approximately

A. 5.72\AA

B. 0.93\AA

C. 1.86\AA

D. 3.22\AA

Answer: C



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2. Which of the following compounds is not an antacid?

A. Phenelzine

B. Ranitidine

C. Aluminium hydroxide

D. Cimetidine

Answer: A



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3. The synthesis of alkyl fluoride is best accomplished by:

A. Finkelstein reaction

B. Swarts reaction

C. Free radical fluorination

D. Sandmeyer's reaction

Answer: B

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4. In Bohr series of lines of hydrogen spectrum, third line from the red end corresponds to which one of the following inner orbit jumps of electron for Bohr orbit in atom in hydrogen :

A. $5 \rightarrow 2$

B. $4 \rightarrow 1$

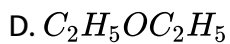
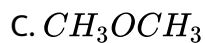
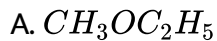
C. $2 \rightarrow 5$

D. $3 \rightarrow 2$

Answer: A

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5. The ether that undergoes electrophilic substitution reactions is



Answer: B

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6. Aldol condensation will not be observed in

A. chloral

B. phenylacetaldehyde

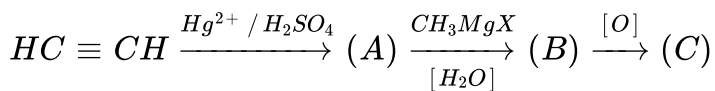
C. hexanal

D. nitromethane

Answer: A

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7. In the following sequence of reaction, the end product is :



A. acetic acid

B. isopropyl alcohol

C. acetone

D. ethanol

Answer: C

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8. The reaction $RCH_2CH_2COOH \xrightarrow{RedP} R - CH_2 - CH - COOH$

- A. Reimer- Tiemann reaction
- B. Hell-volhard Zelinsky reaction
- C. Cannizzaro reaction
- D. Sandmeyer reaction

Answer: B



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9. A triglyceride can have how many different acyl groups?

- A. 3
- B. 2
- C. 1
- D. 4

Answer: A



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10. $\alpha - D(+) - \text{glucose}$ and $\beta - D(+) - \text{glucose}$ are:

A. conformers

B. epimers

C. anomers

D. enantiomers

Answer: C



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11. Which one of the following is not a condensation polymer?

A. Melamine

B. Glyptal

C. Dacron

D. Neoprene

Answer: D

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12. Teflon and neoprene are

A. copolymers

B. condensation polymers

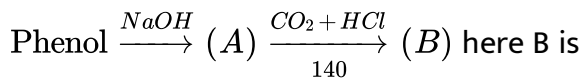
C. homopolymers

D. monomers

Answer: C

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13. In the reaction



- A. benzaldehyde
- B. chlorobenzene
- C. benzoic acid
- D. salicylic acid

Answer: D

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14. The molar heat capacity of water at constant pressure, C_p , is $75 \text{ JK}^{-1} \text{ mol}^{-1}$. When 1.0 kJ of heat is supplied to 100 g water which is free to expand, the increase in temperature of water is :

- A. 6.6K
- B. 1.2K

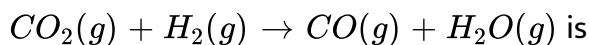
C. 2.4K

D. 4.8K

Answer: B

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15. ΔH_1° for $CO_2(g)$, $CO(g)$ and $H_2O(g)$ are -393.5 , -110.5 and $-241.8 \text{ kJ mol}^{-1}$ respectively. Standard enthalpy change for the reaction



A. 524.1

B. 41.2

C. -265.5

D. -41.2

Answer: B

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16. Which of the following relation represents correct relation between standard electrode potential and equilibrium constant?

I. $\log K = \frac{nFE^\circ}{2.303RT}$

II. $K = e^{\frac{nFE}{RT}}$

III. $\log K = \frac{-nFE^\circ}{2.303RT}$

IV. $\log K = 0.4342 \frac{-nFE^\circ}{RT}$

Choose the correct statement(s).

A. I, II and III are correct

B. II and III are correct

C. I, II and IV are correct

D. I and IV are correct

Answer: C



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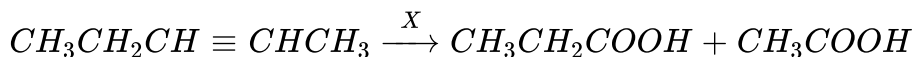
17. At 25°C , the solubility product of $\text{Mg}(\text{OH})_2$ is 1.0×10^{-11} . At which pH , will Mg^{2+} ions start precipitating in the form of $\text{Mg}(\text{OH})_2$ from a solution of 0.001M Mg^{2+} ions ?

- A. 9
- B. 10
- C. 11
- D. 8

Answer: B

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18. In the given reaction



The X is

- A. $\text{C}_2\text{H}_5\text{ONa}$

B. Conc. HCl + Anhy $ZnCl_2$

C. Anh. $AlCl_3$

D. $KMnO_4/OH^-$

Answer: D

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19. The strongest ortho/para and the strongest meta directing groups, respectively, are

A. $-NO_2$ and $-NH_2$

B. $-CONH_2$ and $-NH_2$

C. $-NH_2$ and $-CONH_2$

D. $-NH_2$ and $-NO_2$

Answer: D

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20. Volume of water needed to mix with 10 mL 10N HNO_3 to get 0.1 N HNO_3 is :

- A. 1000 mL
- B. 990 mL
- C. 1010 mL
- D. 10mL

Answer: B



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21. Hybridisation states of C in CH_3 and CH_4 are

- A. sp^2 & sp^3
- B. sp^2 & sp^2
- C. sp^2 & sp^2

D. sp^3 & sp^3

Answer: A

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22. Which of the following substances has the least covalent character ?

A. Cl_2O

B. NCl_3

C. $PbCl_2$

D. $BaCl_2$

Answer: D

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23. The law of triad is applicable to a group of a) Cl, Br, I b) C, N, O c) Na, K, Rb d) H, O, N

A. Cl, Br, I

B. C, N, O

C. Na, K, Rb

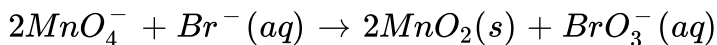
D. H, O, N

Answer: A



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24. Consider the following reaction occurring in basic medium



How the above reaction can be balanced further ?

A. By adding $2OH^-$ ions on right side

B. By adding one H_2O molecule to left side

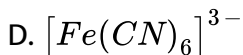
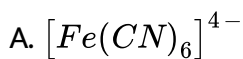
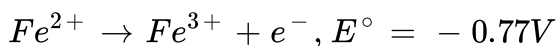
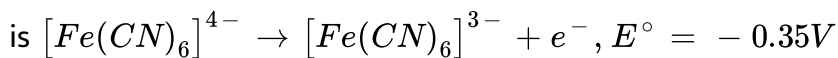
C. By adding $2H^+$ ions on right side

D. Both (a) and (b)

Answer: D

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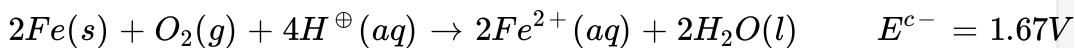
25. On the basis of the following E° values, the strongest oxidizing agent



Answer: C

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26. Consider the following cell reaction :



At $[Fe^{2+}] = 10^{-3}M$, $p(O_2) = 0.1atm$ and $pH = 3$.

The cell potential at $25^{\circ}C$ is

A. 1.47 V

B. 1.77 V

C. 1.87 V

D. (c) 1.87 V (d)

Answer: D



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27. Which one of the following impurities present in colloidal solution cannot be removed by electrodialysis?

A. Sodium chloride

B. Potassium sulphate

C. Urea

D. Calcium chloride

Answer: C

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28. The pronounced change from non-metallic behaviour and also increase in the basicity of oxides from nitrogen to bismuth in group 15 is principally due to increasing size of the atoms. The ionisation potential of nitrogen is very high on account of its small size. However, ionisation potential decreases regularly on descending the group.

Which one of the following fluorides does not exist ?

A. NF_5

B. PF_5

C. AsF_5

D. SbF_5

Answer: B

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29. Which of the following are peroxyacids of sulphur ?

A. H_2SO_5 and $H_2S_2O_8$

B. H_2SO_5 and $H_2S_2O_7$

C. $H_2S_2O_7$ and $H_2S_2O_8$

D. $H_2S_2O_6$ and $H_2S_2O_7$

Answer: A

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30. For d block elements the first ionization potential is of the order

A. $Zn > Fe > Cu > Cr$

B. $Sc = Ti < V = Cr$

C. $Zn > Cu > Ni < Co$

D. $V > Cr > Mn > Fe$

Answer: A

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31. Which of the following coordination compounds would exhibit optical isomerism?

A. pentamminenitrocobalt(III) iodide

B. diamminedichloroplatinum(II)

C. trans-dicyanobis (ethylenediamine) chromium (III) chloride

D. tris-(ethylenediamine) cobalt (III) bromide

Answer: D



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32. A solution of urea boils at $100.18^{\circ}C$ at the atmospheric pressure. If K_f and K_b for water are 1.86 and $0.512Kkgmol^{-1}$ respectively, the above solution will freeze at,

- A. 0.654°
- B. $-0.645^{\circ}C$
- C. $6.54^{\circ}C$
- D. $-6.54^{\circ}C$

Answer:



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33. Pure hydrogen sulphide is stored in a tank of 100 litre capacity at $20^{\circ}C$ and 2 atm pressure. The mass of the gas will be

A. 34 g

B. 340 g

C. 282.68 g

D. 28.24 g

Answer:



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34. $2CuFeS_2 + O_2 \rightarrow Cu_2S + 2FeS + SO_2$ Which process of metallurgy of copper is represented by above equation ?

A. Concentration

B. Roasting

C. Reduction

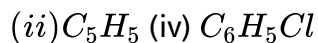
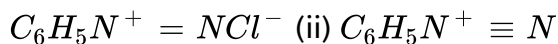
D. Purification

Answer:



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35. Which of the following are intermediates in Sandmeyer reaction ?



A. (ii) and (iii)

B. (ii) and (iv)

C. (i) and (ii)

D. (i) and (iv)

Answer:



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36. When zeolite (hydrated sodium aluminium silicate) is treated with hard water the sodium ions are exchanged with

A. H^+ ions

B. Ca^{2+} ions

C. SO_4^{2-} ions

D. None of these

Answer:



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37. A laboratory reagent imparts green colour to the flame. On heating with solid $K_2Cr_2O_7$ and conc. H_2SO_4 it evolves a red gas. Identify the reagent .

A. $CaCl_2$

B. $BaCl_2$

C. $CuCl_2$

D. None of these

Answer:



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38. Assertion : Both rhombic and monoclinic sulphur exist as S_8 but oxygen exists as O_2 .

Reason : Oxygen forms $p\pi - p\pi$ multiple bond due to small size and small length but $p\pi - p\pi$ bonding is not possible in sulphur.

- A. Assertion is correct, reason is correct, reason is a correct explanation for assertion.
- B. Assertion is correct, reason is correct, reason is not a correct explanation for assertion
- C. Assertion is correct, reason is incorrect
- D. Assertion is incorrect, reason is correct.

Answer:



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39. Assertion: Aniline does not undergo Friedel-Crafts reactions. Reason:

– NH_2 group of aniline reacts with $AlCl_3$ to give acid-base reaction.

A. Assertion is correct, reason is correct, reason is a correct explanation for assertion.

B. Assertion is correct, reason is correct, reason is not a correct explanation for assertion

C. Assertion is correct, reason is incorrect

D. Assertion is incorrect, reason is correct.

Answer:



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40. Assertion: Equal moles of different substances contains same number of constituent particles.

Reason: Equal weights of different substances contain the same number of constituent particles.

- A. Assertion is correct, reason is correct, reason is a correct explanation for assertion.
- B. Assertion is correct, reason is correct, reason is not a correct explanation for assertion
- C. Assertion is correct, reason is incorrect
- D. Assertion is incorrect, reason is correct.

Answer:

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41. Assertion: $HClO_4$ is a stronger acid than $HClO_3$.

Reason: Oxidation state of Cl in $HClO_4$ is $+VII$ and in $HClO_3$ is $+V$.

A. Assertion is correct, reason is correct, reason is a correct explanation for assertion.

B. Assertion is correct, reason is correct, reason is not a correct explanation for assertion

C. Assertion is correct, reason is incorrect

D. Assertion is incorrect, reason is correct.

Answer:



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42. Assertion : Lithium carbonate is not so stable to heat.

Reason : Lithium being very small in size polarizes large CO_3^{2-} ion leading to the formation of more stable Li_2O and CO_2

A. Assertion is correct, reason is correct, reason is a correct explanation for assertion.

B. Assertion is correct, reason is correct, reason is not a correct explanation for assertion

C. Assertion is correct, reason is incorrect

D. Assertion is incorrect, reason is correct.

Answer:

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43. Statement - If one component obeyed Raoult's law over a certain range of composition, the other component would not obey Henry's law in that range.

Explanation - Raoult's law is a special case of Henry's law.

A. Assertion is correct, reason is correct, reason is a correct explanation for assertion.

B. Assertion is correct, reason is correct, reason is not a correct explanation for assertion

C. Assertion is correct, reason is incorrect

D. Assertion is incorrect, reason is correct.

Answer:

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44. Assertion (A) Gases do not liquefy above their critical temperature, even on applying high pressure.

Reason (R) Above critical temperature, the molecular speed is high and intermolecular attractions cannot hold the molecules together because they escape because of high speed.

A. Assertion is correct, reason is correct, reason is a correct explanation for assertion.

B. Assertion is correct, reason is correct, reason is not a correct explanation for assertion

C. Assertion is correct, reason is incorrect

D. Assertion is incorrect, reason is correct.

Answer:

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45. Assertion : Aniline is better nucleophile than anilium ion.

Reason : Anilium ion have +ve charge.

A. Assertion is correct, reason is correct, reason is a correct explanation for assertion.

B. Assertion is correct, reason is correct, reason is not a correct explanation for assertion

C. Assertion is correct, reason is incorrect

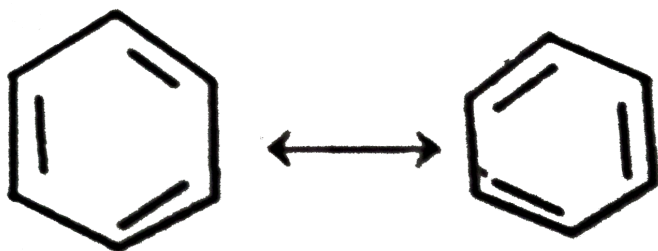
D. Assertion is incorrect, reason is correct.

Answer: C

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46. Assertion : Benzene exhibit tow different bond length , due to C- C single and C = C double bonds .

Reason : Actual structure of benzene is a hybrid of following two structures.



- A. Assertion is correct, reason is correct, reason is a correct explanation for assertion.
- B. Assertion is correct, reason is correct, reason is not a correct explanation for assertion
- C. Assertion is correct, reason is incorrect
- D. Assertion is incorrect, reason is correct.

Answer: A



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47. Assertion (*A*): Galvanized iron does not rust.

Reason (*R*): *Zn* has a more negative electrode potential than *Fe*.

- A. Assertion is correct, reason is correct, reason is a correct explanation for assertion.
- B. Assertion is correct, reason is correct, reason is not a correct explanation for assertion
- C. Assertion is correct, reason is incorrect
- D. Assertion is incorrect, reason is correct.

Answer: C



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48. Assertion : Atomic radius of gallium is higher than that of aluminium

Reason : The presence of additional d-electron offer poor screening effect for the outer electrons from increased nuclear charge.

A. Assertion is correct, reason is correct, reason is a correct explanation for assertion.

B. Assertion is correct, reason is correct, reason is not a correct explanation for assertion

C. Assertion is correct, reason is incorrect

D. Assertion is incorrect, reason is correct.

Answer: A



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49. Assertion : The radius of the first orbit of hydrogen atom is 0.529\AA

Reason : NF_3 ionizes to give F^{-1} ions in aqueous solution.

A. Assertion is correct, reason is correct, reason is a correct explanation for assertion.

B. Assertion is correct, reason is correct, reason is not a correct explanation for assertion

C. Assertion is correct, reason is incorrect

D. Assertion is incorrect, reason is correct.

Answer: C



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50. Assertion : S_N2 reaction of an optically active aryl halide with an aqueous solution of KOH always gives an alcohol with opposite sign of rotation.

Reason : S_N reactions always proceed with inversion of configuration.

A. Assertion is correct, reason is correct, reason is a correct explanation for assertion.

B. Assertion is correct, reason is correct, reason is not a correct explanation for assertion

C. Assertion is correct, reason is incorrect

D. Assertion is incorrect, reason is correct.

Answer: D

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51. Assertion : Magnetic moment values of actinides are lesser than the theoretically predicted values.

Reason : Actinide elements are strongly paramagnetic.

A. Assertion is correct, reason is correct, reason is a correct explanation for assertion.

B. Assertion is correct, reason is correct, reason is not a correct explanation for assertion

C. Assertion is correct, reason is incorrect

D. Assertion is incorrect, reason is correct.

Answer: B



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52. Assertion : Sedatives are given to patients who are mentally agitated and violent.

Reason : Sedatives are used to suppress the activities of central nervous system.

A. Assertion is correct, reason is correct, reason is a correct explanation for assertion.

B. Assertion is correct, reason is correct, reason is not a correct explanation for assertion

C. Assertion is correct, reason is incorrect

D. Assertion is incorrect, reason is correct.

Answer: A



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