



CHEMISTRY

BOOKS - AIIMS PREVIOUS YEAR PAPERS

AIIMS 1998

Chemistry

1. If one wished to remove substantially all of all chloride ions from an aqueous solution, this could be done by the addition of an aqueous solution of

A. gelatin

B. starch

C. $AgNO_3$

D. Na_2SO_4

Answer: C



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2. The basic building block of proteins is (are)

A. ammonia

B. amino acids

C. nitrogenous bases

D. messenger RNA

Answer: B



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3. If it is known that H_2S is a weak acid that ionizes to form $2H^+$ and S^{2-} , lowering the pH of a solution of H_2S by adding HCl would

- A. lower the S^{2-} concentration
- B. have no effect on S^{2-} concentration
- C. raise the S^{2-} concentration
- D. not be possible.

Answer: A



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4. In transcription of RNA from DNA , thymine will form a base pair only with

A. cytosine

B. guanine

C. adenine

D. thymine.

Answer: C



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5. Theoretically the ring monobromination of 4-bromo-1,2-disopropylbenzene could produce ____ isomers .

A. 5

B. 4

C. 3

D. 2

Answer: C



6. Prolonged boiling of animal fat with lye is called

A. saponification

B. stain removal

C. ecology

D. conjugation

Answer: A



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7. The hydronium ion is

- A. an uranium byproduct
- B. an ion with the formula of H_2O^+
- C. really a free radical rather than an ion
- D. a protonated water molecule.

Answer: D



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8. The smallest organic ring compound that may be synthesized contains ____ carbon atoms

A. 5

B. 4

C. 3

D. 7

Answer: C



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9. The process of fermentation can be considered to be

A. dehydration

B. oxidation

C. anaerobic respiration

D. aerobic respiration

Answer: C



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10. Without considering stereoisomers the number of possible dibromobutane isomers is

A. 5

B. 4

C. 3

D. 8

Answer: B



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11. Consider this reaction $Fe^{++} \xrightleftharpoons{\hspace{1cm}} Fe^{+++} + e^{-}$

- A. The reaction toward the left is a reduction
- B. The reaction toward the right is a reduction
- C. The reaction toward the right is an oxidation.
- D. One and three are correct

Answer: D



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12. The neutralization of 50 ml of 0.25 NH_2SO_4 will require ___ ml of 0.50 N NaOH.

A. 2.5

B. 0.25

C. 50

D. 25

Answer: D



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13. Of the compounds listed below , which has the greatest affinity for combining with hemoglobin ?

A. helium

B. carbon monoxide, CO

C. oxygen, O_2

D. carbon dioxide, CO_2

Answer: B



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14. Below are listed the major differences between compounds and mixtures . Which one is an incorrect pairing ?

A. MIXTURE-Physical union, COMPOUND-Chemical union

B. MIXTURE-No new substances are formed ,COMPOUND-New substances are formed

C. MIXTURE-Can be separated by physical means ,COMPOUND-Can be separated by physical means

D. MIXTURE-Elements form no definite proportions

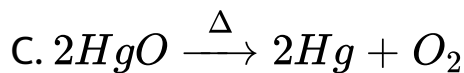
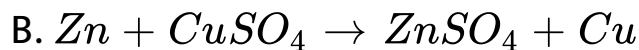
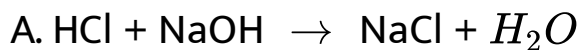
,COMPOUND-Elements form definite proportions

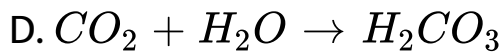
Answer: C



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15. Which of the following reactions is a decomposition reaction ?





Answer: C



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16. Who discovered neutron?

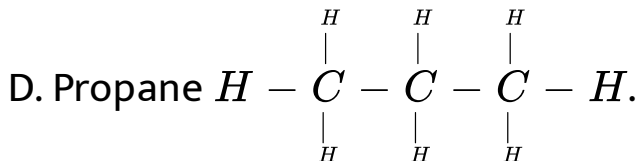
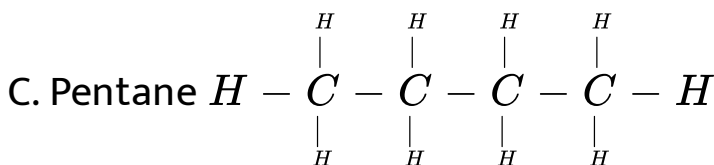
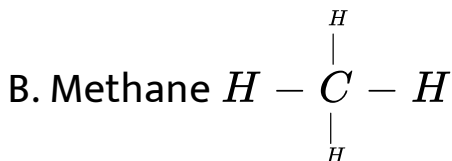
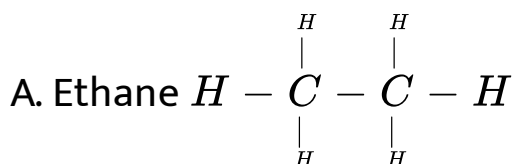
- A. James Chadwick
- B. Ernest Rutherford
- C. Marie and Pierre Curie
- D. Albert Einstein.

Answer: A



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17. Which of the following structural formulas is not properly identified ?



Answer: C



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18. An inorganic cation has been precipitated from water by the addition of NaOH. When we find that the precipitate may be redissolved upon the addition of NaOH or dilute HNO_3 , we may conclude that the precipitate was

- A. amphoteric
- B. colloidal
- C. amorphous
- D. anthropomorphic

Answer: A

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19. The inorganic cation in the question above could be

A. nickel

B. ferric

C. silver

D. aluminium

Answer: D

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20. 2,4-D (2,4-dichlorophenoxyacetic acid) is a potent stimulator of plant metabolism. Most sensitive to it is (are)

- A. phytoplankton
- B. dicotyledons
- C. monocotyledons
- D. kentucky fescue grass

Answer: B



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21. Transuranium elements are

- A. elements that have been postulated but not found naturally or produced artificially
- B. man-made elements with more than 92 protons in the nucleus
- C. found naturally in abundance greater than that of uranium isotopes
- D. found on earth as a result of bombardment by particles from the planet Uranus .

Answer: B



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22. Black and white photographic film is based on the light-catalyzed chemical reaction



Answer: B



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23. Solids

- A. are rigid and have a definite form
- B. possess molecules which vibrate very slowly in a fixed position
- C. possess molecules which are close together
- D. have all of the above characteristics

Answer: D

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24. In order to produce polyvinyl alcohol we would expect to

A. ask for another task . This one has not been done successfully

B. hydroxylate polyethylene

C. polymerize another vinyl monomer and convert the polymer to polyvinyl alcohol

D. polymerize the monomer, vinyl alcohol

Answer: C



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25. Ethyl bromide , methyl bromide, and sodium will react to form

A. propane

B. butane

C. ethane

D. all of the above.

Answer: D



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26. If acetylene is reacted with an excess of sodium metal in hexane and the reaction product is treated with 1-bromopropane , the final product will be

A. 3-octene

B. 4-octyne

C. 8-octane

D. none of the above

Answer: B



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27. Reaction of propanal with HCN followed by acid hydrolysis of the reaction product with produce

A. propanoic acid

B. 1-butylamine

C. α -hydroxybutanoic acid

D. all of the above

Answer: C

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28. A Grignard reagent , such as (CH_3MgBr) will react with C_2H_5OH and then with acidified water to produce

A. a secondary or tertiary alcohol

B. an aldehyde

C. a ketone

D. none of the above

Answer: D



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29. The predominant ring structure of glucose in aqueous solution is called

A. cyclopentyl

B. furanose

C. pyranose

D. none of the above

Answer: C



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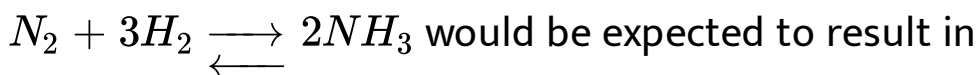
30. When two free radicals collide

- A. termination of the free radical reaction results
- B. they explode with the release of a large quantity of energy
- C. ionization results
- D. none of the above is possible

Answer: A



31. According to the principle of LeChateller, a higher pressure applied to the reversible reaction



- A. shifting the equilibrium to the right
- B. shifting the equilibrium to the left
- C. no change in the equilibrium
- D. increased percentages of NH_3 and H_2

Answer: A

32. Acetaldehyde , in the presence of NaOH, will

- A. produce 3-hydroxybutanol
- B. be converted to acetic acid
- C. produce ethyl acetate
- D. do none of the above

Answer: A



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33. The pH of a weak solution of ammonium hydroxide has been measured . If ammonium chloride is now

added

- A. the pOH will decrease
- B. the pH will increase
- C. the pH will decrease
- D. the acidity will decrease

Answer: C



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34. Which of the following is an incorrect statement ?

A. Certain substances break up into ions when dissolved in water

B. Atoms and ions of the same element have different properties

C. The fewer ions formed, the greater the electric current carried by an electrolyte

D. Ions have a charge equal to the number of electrons gained or lost

Answer: C



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35. In a titration of iodine with sodium thiosulphate , the formation of a blue colour on the addition of colourless starch solution indicates that

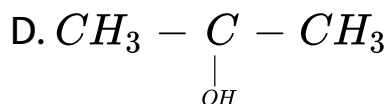
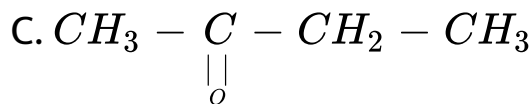
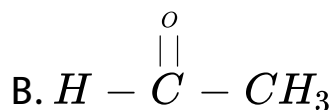
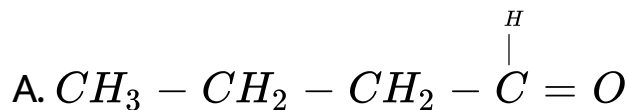
- A. a blue complex of starch , iodine and sodium thiosulphate has been produced
- B. all of the iodine has not been reduced
- C. the glassware has not been washed sufficiently
- D. all of the iodine has not be oxidized

Answer: B



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36. A negative iodoform test (i.e., no yellow precipitate) will be the result when $\text{NaOH} + \text{I}_2$ is reacted with



Answer: A



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37. Factor(s) that influence enzymatic activity is (are)

A. pH

B. concentration, substrate, cofactors

C. enzyme poisons

D. all of the above.

Answer: D



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38. The alpha helix in a protein is classified as the

A. tertiary structure

B. secondary structure

C. primary structure

D. quaternary structure

Answer: B



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39. Methyl iodide and n-propyl iodide may be reacted with sodium metal to produce _____ organic products

A. 4

B. 3

C. 2

D. 8

Answer: B



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40. The compound listed below that would be produced in greatest yield is

A. hexyl iodide

B. sodium propane

C. n-hexane

D. n-butane

Answer: D



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41. Catalytic hydrogenation of phenyl diazonium bromide produces

A. phenylhydrazine

B. bromobenzene

C. benzene

D. phenylamine

Answer: A



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42. Addition of water to metallic sodium produces

A. hydrogen and sodium hydroxide

B. sodium hydrate

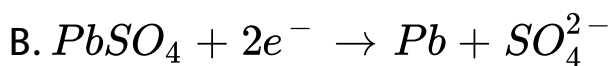
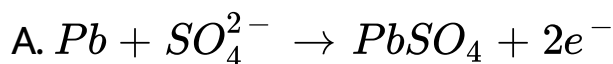
C. oxygen and sodium hydride

D. nitrogen and sodium hydride.

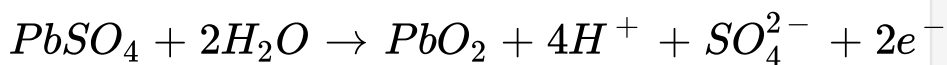
Answer: A



43. The common lead storage battery produces electricity by two half cell reactions, one of which is (written in the direction of production of electricity)



C.



D. none of the above

Answer: A

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44. Calcium carbide reacts with water to produce

- A. methane
- B. carbon dioxide
- C. acetylene
- D. carbohydrate

Answer: C

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45. Which of the following aqueous solutions will have the lowest freezing point ?

A. 1.5 M glucose

B. 0.3 M Na_2SO_4

C. 1 M NaCl

D. H_2O

Answer: C



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46. The reaction of HBr with 1-propene in the presence of peroxides will produce primarily

- A. 2-bromopropane
- B. 1-bromopropane
- C. 2-bromopropene
- D. 1,2-dibromopropane

Answer: B



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47. A zwitter ion is a molecule containing

A. more than one cationic or anionic function

B. polar and nonpolar groups

C. both cationic and anionic functions

D. none of the above

Answer: C



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48. Use of helium is preferred over use of hydrogen in airships (e.g., blimps) because

A. helium is chemically less reactive

B. helium has a lower density

C. both of the above

D. none of the above.

Answer: A

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49. Low molecules weight mercaptans are often added to natural gas to

A. provide a stench which is helpful in the detection of gas leaks

B. prevent corrosion of the pipelines

C. produce a pleasant deodorant during burning

D. slightly retard the burning

Answer: A



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50. Nucleotides are composed of two types of sugars

A. glucose and ribose

B. glucose and maltose

C. ribose and deoxyribose

D. maltose and deoxyribose

Answer: C



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51. Assertion: Noble gases can be liquefied.

Reason: Attractive forces can exist between nonpolar molecules.

A. Assertion is true but the Reason is false

B. Assertion is false, Reason is true

C. Both Assertion and Reason are true and the

Reason is a correct explanation of the Reason.

D. Both Assertion and Reason are true but Reason is not a correct explanation of the assertion.

Answer: D

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52. Assertion : Alkali metal salts give colour to the Bunsen flame .

Reasoning : This is due to excitation of valence shell electrons of sodium ions from lower to higher orbitals

A. Assertion is true but the Reason is false

B. Assertion is false, Reason is true

C. Both Assertion and Reason are true and the

Reason is a correct explanation of the Assertion.

D. Both Assertion and Reason are true but Reason

is not a correct explanation of the assertion.

Answer: C



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53. Assertion: Amongst the halogens, fluorine can oxidise the elements to the highest oxidation- state.

Reason: Due to small size of fluoride ion, it is difficult

to oxidise fluoride ion to fluorine. Hence reverse reaction takes place more easily.

A. Assertion is true but the Reason is false

B. Assertion is false, Reason is true

C. Both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

D. Both Assertion and Reason are true but Reason is not a correct explanation of the assertion.

Answer: D



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54. Assertion: A solution of bromine in CCl_4 is decolorised on passing acetylene gas through it

Reasoning : Bromine is expelled from the solution by acetylene gas

- A. Assertion is true but the Reason is false
- B. Assertion is false, Reason is true
- C. Both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.
- D. Both Assertion and Reason are true but Reason is not a correct explanation of the assertion.

Answer: A



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55. Assertion (A) : When the transition element ionises, the $4s$ -orbital electrons are removed before the $3d$ -orbital electrons.

Reason (R) : The energy of $3d$ -orbital electrons is lower than that of $4s$ -orbital electrons.

- A. Assertion is true but the Reason is false
- B. Assertion is false, Reason is true
- C. Both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.
- D. Both Assertion and Reason are true but Reason is not a correct explanation of the assertion.

Answer: A



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56. Assertion: Nitrogen is unreactive at room temperature but becomes reactive at elevated temperature (on heating or in the presence of catalysts).

Reason: In nitrogen molecule, there is extensive delocalisation of electrons.

A. Assertion is true but the Reason is false

B. Assertion is false, Reason is true

C. Both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

D. Both Assertion and Reason are true but Reason is not a correct explanation of the assertion.

Answer: A

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57. Assertion: Fluorescein is an adsorption indicator.

Reasoning : The indicator fluorescein is a dye

A. Assertion is true but the Reason is false

B. Assertion is false, Reason is true

C. Both Assertion and Reason are true and the

Reason is a correct explanation of the Assertion.

D. Both Assertion and Reason are true but Reason

is not a correct explanation of the assertion.

Answer: D



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58. Statement I: All enzymes are proteins but all

proteins are not enzymes.

Statement II: Enzymes are biocatalysts and have stable configuration having an active site.

- A. Assertion is true but the Reason is false
- B. Assertion is false, Reason is true
- C. Both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.
- D. Both Assertion and Reason are true but Reason is not a correct explanation of the assertion.

Answer: D



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59. Assertion (A): Alkali metals are strong reducing agents.

Reason (R): They have only one electron to be lost from their valence shells.

A. Assertion is true but the Reason is false

B. Assertion is false, Reason is true

C. Both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

D. Both Assertion and Reason are true but Reason is not a correct explanation of the assertion.

Answer: C



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60. Assertion (A): Many endothermic reactions that are not spontaneous at room temperature become spontaneous at high temperature.

Reason (R) : Entropy of the system increases with increase in temperature.

A. Assertion is true but the Reason is false

B. Assertion is false, Reason is true

C. Both Assertion and Reason are true and the

Reason is a correct explanation of the Assertion.

D. Both Assertion and Reason are true but Reason

is not a correct explanation of the assertion.

Answer: C



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