



CHEMISTRY

BOOKS - MTG CHEMISTRY (BENGALI ENGLISH)

QUESTION PAPER 2010

Chemistry

1. How nitrobenzene is identified using Mulliken - Barker test ?



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2. Calculate the ratio of the rate of diffusion of oxygen to the rate of diffusion of hydrogen at constant temperature and pressure.



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3. Why B_2 is paramagnetic whereas C_2 is diamagnetic ?



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4. Explain briefly the cause of Lanthanoid contraction.



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5. Explain why aniline is not as basic as ammonia.



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6. At identical temperature and pressure, the rate of diffusion of hydrogen gas is $3\sqrt{3}$ times that of a hydrocarbon having molecular formula C_nH_{2n-2} . What is the value of 'n' ?

A. 1

B. 4

C. 3

D. 8

Answer:



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7. Dipole moment of is 1.5D. The



dipole moment of is

A. 1.5D

B. 2.25 D

C. 1D

D. 3D

Answer:



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8. Which of the following thermodynamic relation is correct ?

A. $dG = VdP - SdT$

B. $dR = PdV + TdS$

C. $dH = -VdP + TdS$

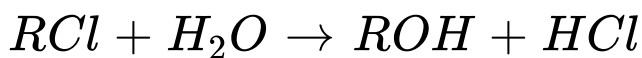
D. $dG = VdP + SdT$

Answer:



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9. In the hydrolysis of an organic chloride in presence of large excess of water,



A. Molecularity and order of reaction both are 2

B. Molecularity is 2 but order of reaction is

C. Molecularity is 1 but order of reaction is

2

D. Molecularity is 1 and order of reaction is

also

Answer:



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10. The potential of a hydrogen electrode at

pH = 10 is

A. 0.59 V

B. 0.00 V

C. $-0.59V$

D. $-0.059V$

Answer:



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11. Calculate K_C for the reversible process given below if $K_p = 167$ and $T = 800^\circ C$.



A. 1.95

B. 1.85

C. 1.89

D. 1.60

Answer:



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12. For a reversible chemical reaction where the forward process is exothermic, which of the following statements is correct ?

- A. The backward reaction has higher activation energy than the forward reaction
- B. The backward and the forward processes have the same activation energy
- C. The backward reaction has lower activation energy
- D. No activation energy is required at all since energy is liberated in the process.

Answer:



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13. In Sommerfeld's modification of Bohr's theory, the trajectory of an electron in a hydrogen atom is

A. a perfect ellipse

B. a closed ellipse - like curve, narrower at the perihelion and flatter at the aphelion position

C. a closed loop on a spherical surface

D. a rosette

Answer:

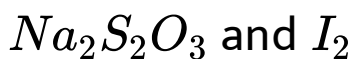


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14. In the reaction of sodium thiosulphate with I_2 in aqueous medium the equivalent weight of sodium thiosulphate is equal to

A. molar mass of sodium thiosulphate

B. the average of molar masses of



C. half the molar mass of sodium

thiosulphate

D. molar mass of sodium thiosulphate $\times 2$

Answer:



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15. $0.1(M)HCl$ and $0.1(M)H_2SO_4$, each of volume 2ml are mixed and the volume is made up to 6 ml by adding 2ml of 0.01 (N) NaCl solution. The pH of the resulting mixture is

A. 1.17

B. 1.0

C. 0.3

D. $\log 2 - \log 3$

Answer:



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16. The molarity of a NaOH solution by dissolving 4g of it in 250 ml water is

A. 0.4 M

B. 0.8 M

C. 0.2 M

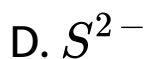
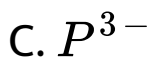
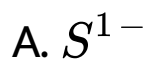
D. 0.1 M

Answer:



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17. If a species has 16 protons, 18 electrons and 16 neutrons, find the species and its charge



Answer:



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18. In a periodic table the basic character of oxides

A. increases from left to right and decreases from up to bottom

B. decreases from right to left and increases from top to bottom

C. decreases from left to right and increases from top to bottom

D. decreases from left to right and
increases from bottom to top

Answer:



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19. Which one of the following contains P-O-P
bond ?

A. Hypophosphorus acid

B. Phosphorus acid

C. Pyrophosphoric acid

D. Orthophosphoric acid

Answer:

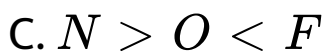


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20. Which of the following orders regarding ionization energy is correct ?

A. $N > O > F$

B. $N < O < F$



Answer:



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21. Which of the following statements regarding ozone is not correct ?

A. The ozone molecule is angular in shape

B. The Ozone is a resonance hybrid of two structures

C. The Oxygen-Oxygen bond length in ozone is identical with that of molecular oxygen

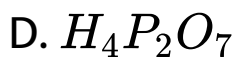
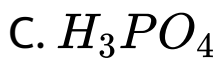
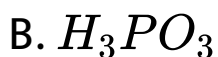
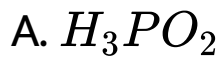
D. Ozone is used as a germicide and disinfectant for the purification of air.

Answer:



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22. P_4O_{10} is the anhydride of



Answer:



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23. Which of the following metals has the largest abundance in the earth's crust ?

A. Aluminium

B. Calcium

C. Magnesium

D. Sodium

Answer:



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24. Which of the following orbitals will have zero probability of finding the electron in the yz plane ?

A. p_x

B. p_y

C. p_z

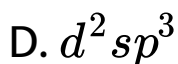
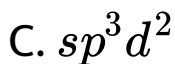
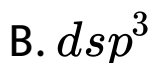
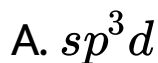
D. d_{yz}

Answer:



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25. What type of orbital hybridisation is considered on P in PCl_5 ?



Answer:



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26. For which element the inertness of the electron pair will not be observed ?

A. Sn

B. Fe

C. Pb

D. In

Answer:



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27. In which of the following molecules is hydrogen bridge bond present ?

A. Water

B. Inorganic benzene

C. Diborane

D. Methanol

Answer:



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28. When a manganous salt is fused with a mixture of KNO_3 and solid NaOH the oxidation number of Mn changes from +2 to

A. +4

B. +3

C. +6

D. +7

Answer:



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29. In hemoglobin the metal ion present is



Answer:



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30. Ortho-and para - hydrogens have

A. Identical chemical properties but
different physical properties

B. Identical physical and chemical
properties

C. Identical physical properties but
different chemical properties

D. Different physical and chemical
properties

Answer:



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31. The bond order of CO molecule is

A. 2

B. 2.5

C. 3

D. 3.5

Answer:



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32. Vitamin C is

- A. Citric acid
- B. Lactic acid
- C. Paracetamol
- D. Ascorbic acid

Answer:



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33. On mixing an alkane with chlorine and irradiating with ultra -violet light, it forms only one-mono-chloro-alkane. The alkane is

A. Propane

B. Pentane

C. Isopentane

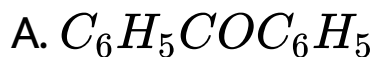
D. Neopentane

Answer:



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34. Keto-enol tautomerism is not observed in



Answer:



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35. What is obtained when nitrobenzene is treated sequentially with (i) NH_4Cl / Zn dust and (ii) $H_2SO_4 / Na_2Cr_2O_7$?

A. meta - chloronitrobenzene

B. para-chloronitrobenzene

C. nitrosobenzene

D. benzene

Answer:



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36. Boiling water reacts with $C_6H_5N_2^+ Cl^-$ to give

- A. aniline
- B. benzylamine
- C. phenol
- D. benzaldehyde

Answer:



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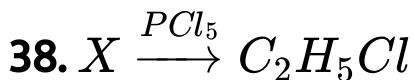
37. Aspirin is

- A. Acetyl salicylic acid
- B. Benzoyl salicylic acid
- C. Chloro benzoic acid
- D. Anthranilic acid

Answer:



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X and Y are



Answer:



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39. Which of the following compounds shows evidence of the strongest hydrogen bonding?

- A. Propan-1-ol
- B. Propan-2-ol
- C. Propan-1, 2-diol
- D. Propan-1,2,3-triol

Answer:



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40. When AgCl is treated with KCN

- A. Ag is precipitated
- B. a complex ion is formed
- C. double decomposition takes place
- D. no reaction takes place

Answer:



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41. Which one of the following is produced when acetone is saturated with HCl gas?

A. Acetone alcohol

B. Phorone

C. Mesityl oxide

D. Benzene

Answer:



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42. Which one of the following is an example of co-polymer ?

A. Buna-S

B. Teflon

C. PVC

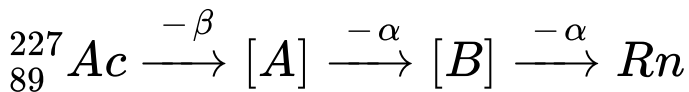
D. Polypropylene

Answer:



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43. Identify [A] and [B] in the following



A. Po, Rn

B. Th, Po

C. Ra, Th

D. Th, Ra

Answer:



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44. A weak acid of dissociation constant 10^5 is being strated with aqueous NaOH solution. The pH at the point of one-third neutralisation of the acid will be

A. $5 + \log 2 - \log 3$

B. $5 - \log 2$

C. $5 - \log 2$

D. $5 - \log 6$

Answer:



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45. Radioactivity of a sample ($z = 72$) decreases 90% after 10 years. What will be the half life of the sample?

A. 5 years

B. 2 years

C. 3 years

D. 10 years

Answer:



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