



CHEMISTRY

BOOKS - UNITED BOOK HOUSE

MODEL QUESTION PAPER 3

Exercise

1. The ratio, of the radii of the first three Bohr orbit in H atom is

A. $1 : 1/2 : 1/3$

B. $1 : 2 : 3$

C. $1 : 4 : 9$

D. $1 : 8 : 27$

Answer:





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2. Which of the following is paramagnetic?

A. O_2

B. N_2

C. O_2^{-2}

D. H_2

Answer:



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3. The shape of CO_2 molecule is similar to

A. H_2O

B. BeF_2

C. SO_2

D. none of these.

Answer:

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4. Inert gas has been added to the following equilibrium system at constant volume $SO_2(g) + \frac{1}{2}O_2(g) \rightleftharpoons SO_3(g)$ To which direction will the equilibrium shift?

- A. Forward
- B. Backward
- C. No effect
- D. none of these.

Answer:

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5. The value of gas constant R is $8.314 X$. Here X represents

A. $\text{LatmK}^{-1}\text{mol}^{-1}$

B. $\text{calmol}^{-1}\text{K}^{-1}$

C. $\text{Jk}^{-1}\text{mol}^{-1}$

D. $\text{kJmol}^{-1}\text{K}^{-1}$

Answer:



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6. Which among the following is not a state function?

A. Internal energy

B. Free energy

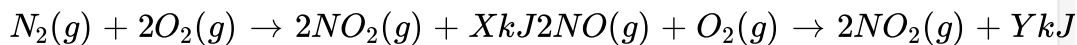
C. work

D. Enthalpy

Answer:

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7.



the enthalpy of formation of NO is

A. $(2X - 2Y)$

B. $X - Y$

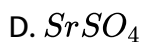
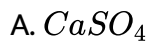
C. $\frac{1}{2}(Y - X)$

D. $\frac{1}{2}(X - Y)$

Answer:

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8. Which of the following alkaline earth metal sulphates has hydration enthalpy higher than lattice enthalpy?



Answer:



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9. Which is maximum reactive towards water?

A. Li

B. Na

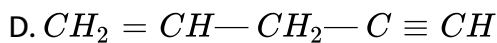
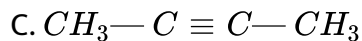
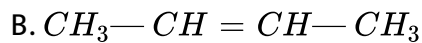
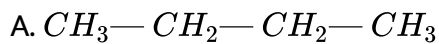
C. K

D. Rb

Answer:

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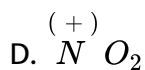
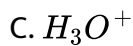
10. Find out the molecule among the following which is linear?



Answer:

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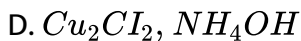
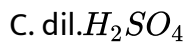
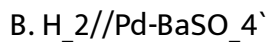
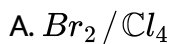
11. Which of the following species cannot act as a celectrophile?



Answer:

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12. Which of the reagents can be used to differentiate between 1-Butyne and 2-Butyne?

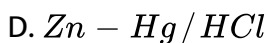
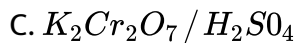
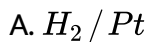


Answer:



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13. Which of the following reagents converts carbonyl compounds into hydrocarbon

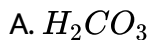


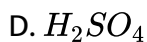
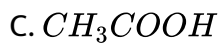
Answer:



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14. Acid rain does not contain





Answer:

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15. Calculate the relative equivalent weight of copper in cuprous oxide

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16. Mention the name of the s-block element which is placed' along with p-block elements..

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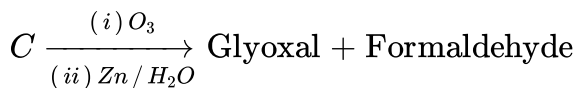
17. Write general electronic configuration of actinoids ?

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18. Volume of a substance is an-property and molar .volume of a substance is an -property of the system.

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19. Identify A... G in the following reaction sequence.



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20. How will you distinguish between each to the given pairs of compounds by a single chemical test ?

1-butene and 2-butene

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21. What is the mass of 1 million of ammonia? Also find the number of ammonia molecules presents in it.

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22. Show that, the relation between kinetic energy and the de-broglie wavelength associated with a moving electron is $\lambda = \frac{h}{\sqrt{2mE}}$

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23. 'd subshell can accomodate a maximum of 10 electrons'-Justify this statement.

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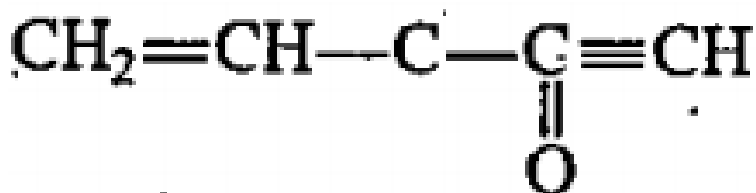
24. Explain— Boron is unable to form BF_6^{3-} ion.

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25. What are fullerenes? How are they prepared?

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26. Name IUPAC name of the following :



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27. Name IUPAC name of the following :



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28. Identify electrophilic centre in the following :

CH_3CHO and CH_3CN .

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29. Name two components of photochemical smog and mention one of the harmful effects of this smog.

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30. An atom of an element contains 2, 8 and 5 electrons in K, L and M shell respectively. Find out :- total number of electrons in 'S' and 'P' orbitals,

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31. An atom of an element contains 2, 8 and 5 electrons in K, L and M shell respectively. Find out :- valency of the element.

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32. 2nd Ionisation potential of oxygen is greater than 2nd ionisation potential of Nitrogen— Explain.



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33. What is transitional element.



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34. Atomic number of three elements A, B and C are 10, 13 and 17 respectively:- Find their positions in the periodic table



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35. Atomic number of three elements A, B and C are 10, 13 and 17 respectively:- which one of them will term cation and which one an'anion?



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36. Atomic number of three elements A, B and C are 10, 13 and 17 respectively:-Mention their valences.

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37. Why Cl_2 molecule exists but not Ne_2 molecule.

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38. Give an example of a molecule which violates octet rule.

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39. Between N_2O and NO_2 molecules which one is more polar? Explain.

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40. Mention the state of hybridisation of the central atom in the following molecules/ions : BeCl_2 , NH_4^+ .

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41. Calculate the total pressure in a mixture of 8g of oxygen and 4 g of hydrogen confined in a vessel of 1 dm^3 at 27°C
[$R = 008.2\text{ dm}_3 \cdot \text{k}^{-1}\text{mol}^{-1}$]

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42. What property of molecules of real gases is indicated by van der Waal's constant 'a'?

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43. State and explain the first law of thermodynamics.

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44. Deduce the relation between enthalpy and internal energy for gaseous system :

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45. Write one equation where $\Delta H, = \Delta E$.

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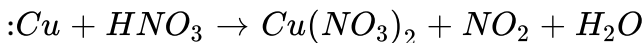
46. In the reaction, $A \rightarrow B + C$, $\Delta H = 25kJm \text{ or } ^{-1}$ and $\Delta S = 62.5JK^{-1}$. At which temperature .the reaction will occur spontaneously at constant pressure...

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47. What is the oxidation number of 'P' atom in $K_4P_2O_7$ molecule?

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48. Balance the following chemical equation by oxidation number method



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49. Balance the following chemical equation by ion-electron method:



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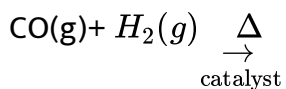
50. What is the change in oxidation number of manganese in the reduction of $KMnO_4$ to $MnSO_4$?

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51. How does H_2O_2 behaves as a bleaching agent?

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52. Complete the following reactions:



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53. Potassium carbonate cannot be prepared by Solvey Process -explain.

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54. Water glass is

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55. What is 'slaked lime'?

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56. Arrange $Be(OH)_2$, $Ba(OH)_2$ and $Ca(OH)_2$ in order of increasing solubility in water and explain the order,

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57. The bond dissociation enthalpy of $C_6H_5CH_2-H$ bond is much less than CH_3H bond— explain.

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58. Give an example of neutral electrophile

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59. How will you detect the presence of sulphur in an organic compound?

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60. $C \equiv C$ bond length is shorter than $C = C$ and $C - C$ bond lengths — Why?

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61. The solubility of zinc phosphate in water is $S \text{ mol L}^{-1}$. Derive the mathematical expression of solubility product of the compound.

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62. What is common ion effect? Cite an example.

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63. Write the conjugate base of $[Al(H_2O)_6]^{3+}$.

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64. The following equilibrium is established during thermal dissociation of $H_2O(g)$ in a closed vessel $H_2O(g) \rightleftharpoons H_2(g) + 1/2O_2(g)$ If the total pressure, equilibrium constant and degree of dissociation is 'P', ' K_P ' and x, then show that, $K_P = \frac{x^{3/2} P^{1/2}}{(1-x)(2+x)^{1/2}}$

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65. If the equilibrium constants of the following equilibrium $SO_2 + \frac{1}{2}O_2 \rightarrow SO_3$ and $2SO_3 \rightarrow 2SO_2 + O_2$ are K_1 and K_2 Which shows the correct relation between K_1 and K_2

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66. What happens when

Aluminium is treated with dilute NaOH.

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67. What happens when :-Silicon dioxide is treated with hydrogen fluoride.

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68. Explain : Carbon shows catenation but silicon does not.

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69. Draw the shape of B_2H_6 molecule.

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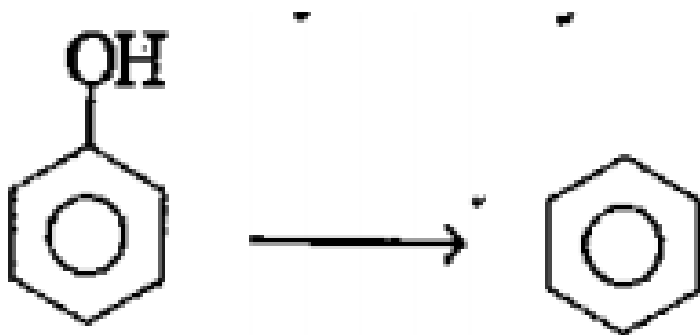
70. How will you distinguish between each of the following pairs of compounds by a single chemical test :-Ethylene and acetylene

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71. How will you distinguish between each of the following pairs of compounds by a single chemical test :- Benzene and Cyclohexene.

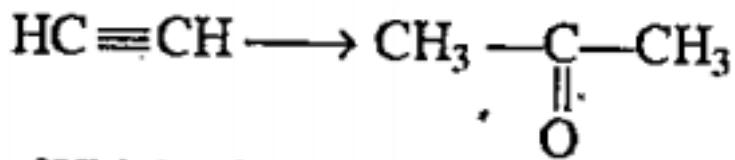
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72. How will you carry out of the following transformations :-



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73. How will you carry out of the following transformations :-



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74. Electrophile used in the nitration of benzene is

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75. Give,example of the following reactions :-Gattermann aldehyde synthesis

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76. Give,example of the following reactions :-Kolbe electrolysis method.

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77. How can thiophene present in a sample of impure benzene be identified ? How can this thiophene be removed ?



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