CHEMISTRY

BOOKS - BEYOND PUBLICATION

STRUCTURE OF ATOM

Example

1. What information does the electronic configuration of an atom provide ?

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2. What is electronic configuration?

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3. Rainbow is an example for continuous spectrum - Explain

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4. How rainbow is a continuous spectrum ?

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5. Which is naturally occurring continuous spectrum ?Explain.

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6. What is absorption spectrum?

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7. What is absorption spectrum?

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8. What is spectrum? How many types of spectrum are there?

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9. What is an orbital? How is it different from Bohr's orbit ?

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10. What is the difference between an orbit and orbital ?

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11. Explain the significance of three quantum numbers in predicting the positions of an electron in an orbit .

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12. How do you appreciate Niels Bohr for his contributions to under standing atomic structure?

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13. What is nl^x method ? How is it useful ?

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14. What is emission spectrum?

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15. What is emission spectrum?

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16. When radiation is emitted then what is the name given to such spectrum. Explain such spectrum ?

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17. Which electron shell is at a higher energy level K or L ?

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18. Explain the reason for K-shell has lower energy than the L - shell.

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19. How many maximum number pf electrons can be accommodated in a principal energy shell?

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20. How many maximum number of electrons that can be accommodated in a 'p' sub shell ?

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21. How many maximum number of electrons can be accommodated in an orbitals ?

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22. How many sub-shells are present in a principal energy shell ?

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23. How many spin orientation are possible for an electron in an orbital ?

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24. In an atom the number electrons in M-shell is equal to the number of electrons in the K and L shell. Answer the following questions. (AS1)

Which is the outer most shell?

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25. In an atom the number electrons in M-shell is equal to the number of electrons in the K and L Shell. Answer the following questions.

How many electrons are there in its outermost shell?

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26. In an atom the number electrons in M-shell is equal to the number of electrons in the K and L Shell. Answer the following questions.

What is the atomic number of element?

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27. In an atom the number electrons in M-shell is equal to the number of electrons in the K and L Shell. Answer the following questions.

Write the electronic configuration of the element.

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28. How many elliptical orbits are added by Sommerfeld in third Bohr's orbit? What was the purpose of adding these elliptical orbits ?

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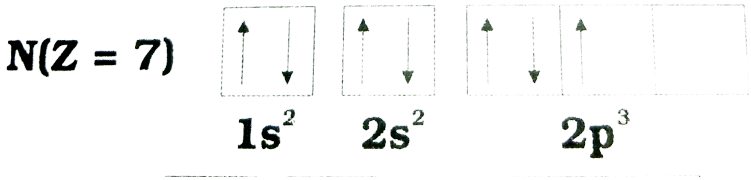
29. Following orbital diagram shows the electronic configuration of nitrogen atom. Which rule does not support this ?



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30. Which rule is violated in the electronic configuration $1s^0 2s^2 2p^4$?

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31. Write the correct electronic configuration of the given nitrogen atom with the help of Hund's rule.

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32. Which rule is violated in the electronic configuration $1s^0 2s^2 2p^4$?

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33. Write the corect electronic configuration of the given $1s^0 2s^2 2p^4$ according to Aufbau principal.

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34. Write the four quantum numbers for the differentiating electron of sodium (Na) atom.

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35. An electron in an atom has the following set of four quantum numbers to which orbital it belong to :

n	l	m_l	m_s
2	0	0	+ ½

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36. Write four quantum numbers for $1s^1$ electron.

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37. Collect the information regarding wavelengths and corresponding frequencies of three primary colours red, blue and green.

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38. Collect the information regarding wavelengths and corresponding frequencies of three primary colours red, blue and green.

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39. The wave length of a radio wave is 1.0m. Find its frequency.

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40. Collect the information of historical development of the atomic theory.

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41. Collect the information about the scientists who developed the atomic theories.

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42. Draw the shapes of s, p and d orbitals.

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43. How do the sub-atomic particles coexist in an electrically neutral atom?

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44. Do all atoms have the same sub-atomic particles?

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45. Why is an atom of one element different from the atoms of other elements?

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46. How are electrons distributed in the space of an atom?

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47. How many colours are there in a rainbow ? What are they ?

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48. How do the vibrating electric and magnetic fields around the charge become a wave that travels through space?

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49. What are the characteristics of electromagnetic waves '?

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50. Can we apply this equation $c = \upsilon\lambda$, to a sound wave '?

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51. Are there any other wavelengths of light other than visible spectrum?

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52. What happens when you heat an iron rod on a flame? Do you find any change in colour on heating an iron rod?

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53. Do you observe any other colour at the same time when one colour Is emitted ?

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54. Do you enjoy Deepavali fire works ? Variety of colours is seen from fire works. How do these colours come from fire works ?

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55. Do you observe yellow light in street lamps? Which will produce yellow light?

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56. Why do different elements emit different flame colours when heated by the same non - luminous flame ?

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57. What does a line spectrum tell us about the structure of an atom?

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58. What happens when an electron gains energy ?

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59. Does the electron retain the energy forever ?

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60. Did Bohr's model account for the splitting of line spectra of a hydrogen atom into finer lines ?

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61. Why is the electron in an atom restricted to revolve around the nucleus at certain fixed distances ?

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62. Do the electrons follow defined paths around the nucleus

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63. What is the velocity of the electron ?

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64. Is it possible to find exact position of electron ? How do you find the position and velocity of an electron ?

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65. Do atoms have a definite boundary, as suggested by Bohr's model'?

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66. What do we call the region of space where the electron might be, at a given time ?

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67. What information do the quantum numbers provide ?

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68. What does each quantum number signify ?

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69. What is the maximum value of l for n = 4 ?

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70. How many values can l have for n = 4 ?

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71. Do all the p-orbitals have the same energy ?

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72. How do electrons in an atom occupy shells, sub-shells and orbitals?

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73. How are two electrons in the Helium atom arranged ?

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74. What are the spins of two electrons in an orbital ?

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75. How many electrons are occupied by an orbital ?

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76. For carbon (C) atom (Z=6), where does the 6th electron go?

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77. For carbon (C) atom (Z=6), where does the 6th electron go? Whether the electron pairs up in the same p-orbital or will it go to the next p-orbital?

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78. Explain the wave nature of light.

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79. Write an activity which shows metal produces colour in flame.

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80. Complete the electronic configuration of the following elements.

Element	Atomic number (Z)	Electronic configuration of elements
C	6	
O	8	
Ne	10	
Mg	12	
Si	14	
S	16	
Ar	18	
Ca	20	
N	7	
F	9	
Na	11	
Al	13	
P	15	
Cl	17	
K	19	

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81. What is dispersion ?

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82. What is electromagnetic specturm ?

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83. What is Zeeman effect ?

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84. What is spectrum? How many types of spectrum are there?

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85. What is speed of electromagnetic wave ?

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86. Which colour of light has longest wavelength ?

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87. The electrons belong to which orbit neither loses nor gains energy ?

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88. If n = 5, then what is the maximum value for 'l'?

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89. What is the probability of finding electron is called ?

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90. If l=4, what are the number of values for m_l ?

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91. What are values of m_s ?

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92. What is an electronic configuration ?

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93. Explain Pauli's Exclusion principle with an example.

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94. What is Aufbau principle ?

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95. What is Hund's rule ?

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96. Write Planck's equation .

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97. What is electromagnetic specturm ?

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98. What is wavelength ?

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99. What is frequency ?

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100. Explain the formation of a rainbow.

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101. Which model explain fine spectrum of atom ?

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102. (A) Group 18 elements are called noble gases

(R) group 18 elements form only very few compounds

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103. Which elements are highly stable?

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104. What is the general electronic configuration of Noble gases?

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105. What is visible spectrum ? What is its wavelength range ?

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106. What is the significance of Planck's proposal ?

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107. What is the use of a line spectra?

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108. What do you mean by ground state ?

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109. What happens when an electron gains energy ?

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110. What are the failures of Bohr's model of atom ?

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111. What is Sommerfeld's contribution for the structure of atom ?

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112. What is an orbital ?

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113. What are quantum numbers ?

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114. What information do the quantum numbers provide ?

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115. How many electrons are occupied by an orbital ?

Watch Video Solution

116. When does electromagnetic waves produce ?

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117. What happens when an object is suitably excited by heating ?

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118. Give an example for continuous spectrum.

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119. Which is example for line spectrum ?

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120. How wavelength and velocity of light related?

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121. What is meant by Aufbau ?

Watch Video Solution

122. Which elements are examples of Noble gases?

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123. Which element has duplet configuration?

Watch Video Solution

124. Why does spin quantum number introduced ?

Watch Video Solution

125. Why does spin quantum number introduced ?

Watch Video Solution

126. Write the set of quantum numbers for the electrons in a $3p_z$ orbital.

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127. What is the difference between an orbit and orbital ?

Watch Video Solution

128. Write the set of quantum numbers for all electrons of oxygen atom.

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129. What are the factors which influence electromagnetic energy '?

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130. Name the orbitals present in p sub-shell.

Watch Video Solution

131. Can we apply this equation $c = \upsilon\lambda$, to a sound wave '?

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132. Write the four quantum numbers for the differentiating electrons of lithium (Li) atom .

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133. Write four quantum numbers for $2p^1$ electron .

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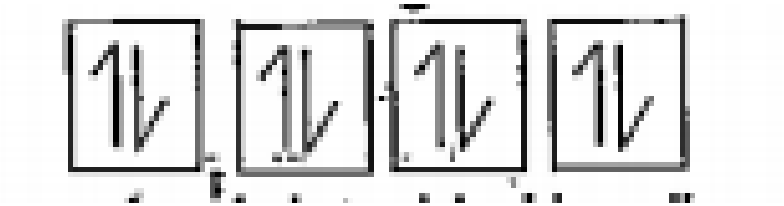
134. Which rule is violted in the following electronic configuration.



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135. What is spectrum? How many types of spectrum are there?

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136. When does electromagnetic waves produce ?

Watch Video Solution

137. What is dispersion ?

Watch Video Solution

138. Explain briefly about spin quantum number.

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139. Draw the diagram of Hydrogen spectrum.

Watch Video Solution

140. Explain Aufbau principle with an example .

Watch Video Solution

141. Explain Hund's rule with an example .

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142. Write electronic configurations of following elements.

Hydrogen

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143. Write electronic configurations of following elements.

Helium

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144. Write electronic configurations of following elements.

Lithium

Watch Video Solution

145. Write electronic configurations of following elements.

Beryllium

Watch Video Solution

146. Write electronic configurations of following elements.

Boron

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147. Expand VIBGYOR.

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148. How do we get a rainbow ?

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149. Why rainbow always forms opposite to the sun ?

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150. What does a line spectrum tell us about the structure of an atom?

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151. How are two electrons in the Helium atom arranged ?

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152. How many electrons are occupied by an orbital ?

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153. Your father asked you to go to the market and purchases an electric lamp. The shopkeeper displayed two lamps one is violet and another is red, which coloured lamp do you purchases to put in your bed room ? Support your choice of solution.

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154. The electronic configuration of copper is

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155. Why are chromium and copper exceptions to electronic configuration ?

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156. What is relation between subshell (l) and maximum number of electrons ?

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157. Distinguish between line and band spectrum.

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158. How do the vibrating electric and magnetic fields around the charge become a wave that travels through space?

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159. The electronic configuration of an atom is as follows $1s^2$, $2s^2$, $2p^2$. Which element's atom is it ?

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160. The electronic configuration of an atom is as follows $1s^2$, $2s^2$, $2p^2$. Which orbital is the last electron in ?

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161. The electronic configuration of an atom is as follows $1s^2, 2s^2, 2p^2$. When excited what could be the number of lone / single electrons in this atom ?

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162. The electronic configuration of an atom is as follows: What is the value of principal quantum numbers of two electrons in the first box ?

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163. An electron is an atom has the following set four quantum numbers to which orbits it belongs to ?

n	l	m_l	m_s
3	0	0	$+\frac{1}{2}$

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164. Draw the diagram of electromagnetic wave

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165. Explain electromagnetic spectrum. Draw its diagram.

Watch Video Solution

166. What information do the quantum numbers provide ?

Watch Video Solution

167. Explain Pauli's Exclusion principle with an example.

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168. Draw Moeller chart of Ctlling order of atomic orbitals.

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169. Where do the rains come from? explain in detailed way.

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170. Draw the shapes of s, p and d orbitals.

Watch Video Solution

171. Distinguish between emission and absorption spectrum.

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172. Explain Bohr's model of hydrogen atom and its limitations.

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173. Explain Bohr- Sommerfeld model of an atom. What is the merit of this model? What are its limitations?

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174. What are the elliptical orbits proposed by Sommerfeld ?

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175. What is the use of quantum numbers ?What is electronic configuration ?

Watch Video Solution

176. Why do an orbital can occupy only two electrons in it ?

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177. The wavelength range of the visible spectrum extends from violet (400 nm) to red (750nm). Express these wavelengths in frequencies (Hz) . (1nm $= 10^{-9}$m)

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178. Calculate

frequency of yellow radiation having wavelength 5800 Å .

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179. An atomic orbital has n = 2. What are the possible values of I and m, ?

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180. The quantum numbers of electrons are given below. Arrange them in order of increasing energies . Do any of these combinations have same energy ?

a) $n = 4, l = 2, m_l = -2, m_s = +1/2$

b) $n = 3, l = 2, m_l = -1, m_s = -1/2$

c) $n = 4, l = 1, m_l = 0, m_s = +1/2$

d) $n = 3, l = 1, m_l = -1, m_s = -1/2$

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181. Why do different elements emit different flame colours when heated by the same non - luminous flame ?

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182. What is electromagnetic specturm ?

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183. Do the electrons follow defined paths around the nucleus

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184. What is the maximum number of electrons that can be kept in 'N' shell ? What is the rule followed ?

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185. What are the failures of Bohr's model of atom ?

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186. "Each element emits its own characteristic colour". Write the process to prove this.

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187. What is the main failure of Bohr-Sommerfeld model ?

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188. What is the use of quantum numbers ?What is electronic configuration ?

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Exercise

1. An emission spectrum consists of bright spectral lines on a dark back ground. Which one of the following does not correspond to the bright spectral lines ?

A. Frequency of emitted radiation

B. Wavelength of emitted radiation

C. Energy of emitted radiation

D. Velocity of light

Answer:

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2. The maximum number of electrons that can be accommodated in the L-shell of an atom is

A. 2

B. 4

C. 8

D. 16

Answer:

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3. If l = 1 for an atom, then the number of orbitals in its sub-shell is

A. 1

B. 2

C. 3

D. 0

Answer:

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4. The quantum number which explains about size and energy of the orbit or shell is

A. n

B. l

C. m_l

D. m_s

Answer:

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5. Bohr's model can explain

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6. What is the use of quantum numbers ?What is electronic configuration ?

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7. What is Aufbau principle ?

Watch Video Solution

8. What information does the electronic configuration of an atom provide ?

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9. What is an orbital ?

Watch Video Solution

10. Which electron shell is at a higher energy level K or L ?

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11. Who introduced magnetic quantum number ?

A. Lande

B. Bohr

C. Sommerfeld

D. Goudsmit

Answer:

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12. What is the shape of d-orbital ?

A. spherical

B. dumb-bell

C. double dumb-bell

D. f- orbital

Answer:

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13. 'l' ' value of d- orbital is _____

A. s - orbital

B. p - orbital

C. d - orbital

D. f - orbital

Answer:

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14. $1s^2 2s^2 2p^1$ is the electronic configuration of

A. Beryllium

B. Boron

C. Carbon

D. Nitrogen

Answer:

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15. Which of the following elements have high atomic weight ?

A. Barium

B. Iodine

C. Tellurium

D. Iron

Answer:

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16. Who proposed the spectrum of hydrogen atom ?

A. Bohr

B. Sommerfeld

C. Planck

D. Lande

Answer:

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17. How many number of orbitals are there in the sub-shell of a magnetic quantum number if l = 3 ?

A. 1

B. 3

C. 5

D. 7

Answer:

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18. The values of spin quantum numbers are (m_s)

A. +1/2

B. -1/2

C. A and B

D. None of these

Answer:

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19. Name the principle , which says an orbital can hold only 2 electrons and explain .

A. Pauli

B. Aufbau

C. Hund's

D. All of these

Answer:

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20. What is the shape of p-orbital ?

A. spherical

B. dumbbell

C. double dumbbell

D. All of these

Answer:

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21. Principal quantum number is related to

A. Principal quantum numbber (n)

B. Angular - momentum quantum number(l)

C. Magnetic quantum number (m_l)

D. Spin quantum number(m_s)

Answer:

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22. Is there any rule to find the maximum number of electrons in any shell ?

A. 2n

B. $2n^3$

C. $1n^2$

D. $2n^3$

Answer:

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23. Which quantum number describes the orientation of the orbital in space ?

A. Principal quantum number

B. Angular-momentum quantum number

C. Magnetic quantum number

D. Spin quantum number

Answer:

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24. If both spin quantum number values are positive then the spins are _____

A. Parallel

B. Perpendicular

C. Intersects

D. Coincidence

Answer:

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25. Among 3s, 3p,4s, 3d which has lowest energy?

A. 3s

B. 3p

C. 4s

D. 3d

Answer:

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26. What is the shape of s-orbital ?

A. Spheical

B. Dumbbell

C. Double dumbbell

D. None of these

Answer:

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27. Which of the following produces yellow light ?

a) Sodium lamp b) Sunlight c) LPG gas

A. Sodium

B. Calcium

C. Potassium

D. Cesium

Answer:

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28. Who modified Bohr's theory by introducing elliptical orbits for electron path?

A. Sommerfeld

B. Lande

C. Goudsmit

D. Uhlenbeck

Answer:

Watch Video Solution

29. The range of wavelengths converging red colour to violet colour is called the _____

A. Electromagnetic spectrum

B. Absorption spectrum

C. Visible spectrum

D. All of these

Answer:

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30. Which of the following is responsible to rule out the existence of definite paths or trajectories of electrons ?

A. Pauli's exclusion principle

B. Hund's rule

C. Heisenberg uncertainty principle

D. Aufbau's rule

Answer:

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31. Total number of orbitals associated with third shel would be

A. 2

B. 4

C. 9

D. 3

Answer:

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32. Orbital angular momentum depends upon

A. l

B. n and l

C. n and m

D. m and s

Answer:

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33. Which of the following shell has least energy?

A. L

B. M

C. K

D. N

Answer:

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34. Bohr's atomic model explains the spectrum of _____

A. H

B. He^+

C. Li^+2

D. All

Answer:

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35. Speed of light is

A. $3 \times 10^8 cm/\sec$

B. $3 \times 10^8 m/\sec$

C. $3 \times 10^{10} m/\sec$

D. $3 \times 10^{10} cm/\sec$

Answer:

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36. Which colour has lower energy ?

A. violet

B. blue

C. green

D. red

Answer:

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37. How many elliptical orbits are possible for a given n = 6?

A. 4

B. 3

C. 5

D. 7

Answer:

Watch Video Solution

38. Which of the following shell has least energy?

A. 3s

B. 4p

C. 3d

D. 6s

Answer:

Watch Video Solution

39. Which of the following shells has highest energy

A. 4s

B. 3p

C. 3d

D. 4p

Answer:

Watch Video Solution

40. Who modified Bohr's theory by introducing elliptical orbits for electron path?

A. Rutherford

B. Thomson

C. Sommerfeld

D. Hund

Answer:

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41. Which of the following electronic configuration corresponds to an inert gas ?

A. $1s^2 2s^2 2p^5$

B. $1s^2 2s^2$2p^6`

C. $1s^2 2s^2 2p^6 3s^1$

D. None of these

Answer:

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42. According to Aufbau principle, electron enter first into which of the following orbital ?

A. Highest energy

B. Lowest energy

C. Nearly equal energy

D. None of these

Answer:

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43. The magentic quantum number, m for the outermost electron in the sodium atom is

A. 0

B. $+1$

C. -1

D. -2

Answer:

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44. The maximum number of electrons that can be accommodated in all the orbitals for which $l = 3$. Is

A. 6

B. 10

C. 14

D. 18

Answer:

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45. When 4p orbital in any atom is filled completely,the next electron goes in

A. 5s

B. 3d

C. 4d

D. 4f

Answer:

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46. Nitrogen atom has 3 unpaired electrons in its ground state. It can be explained by

A. Pauli's exclusion principle

B. Aufbaur principle

C. Hund's principle

D. Heisenberg's uncertainty principle

Answer:

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47. All the four quantum numbers may not be the same for any two electrons in a single orbital. This is known as

A. Pauli's exclusion principle

B. Hund's rule

C. Aufbau principle

D. n + l rule

Answer:

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48. The n + l value of 3d orbital is

A. 4

B. 3

C. 5

D. 6

Answer:

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49. The atomic number (Z) of an element is 25. In its ground state, how many electrons are present in "N" shell ?

A. 18

B. 8

C. 32

D. 2

Answer:

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50. What is called the splitting of light into different colours ?

A. Reflection

B. Diffraction

C. Interference

D. Dipersion

Answer:

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51. In an electromagnetic wave electric, magnetic fields are_____to each other.

A. parallel

B. Perpendicular

C. collinear

D. None of these

Answer:

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52. The orbit of least energy _____

A. K

B. L

C. M

D. N

Answer:

Watch Video Solution

53. Among 3p, 4s, 3d, 4p orbitals which has least energy ?

A. 3p

B. 4s

C. 3d

D. 4p

Answer:

Watch Video Solution

54. The quantum number which explains about size and energy of the orbit or shell is

A. n

B. l

C. m_l

D. m_s

Answer:

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55. The sub shells present in L shell are

A. s and d

B. s and p

C. s,p and d

D. s,p,d and f

Answer:

Watch Video Solution

56. The maximum value of l for n=5 is _____

A. 5

B. 3

C. -5

D. 4

Answer:

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57. 'f' orbitals are present in _____

A. K - shell

B. L - shell

C. M - shell

D. N - shell

Answer:

Watch Video Solution

58. The number of m_1 values for $l = 3$ is,

A. 1

B. 3

C. 7

D. 9

Answer:

Watch Video Solution

59. The quantum number which give shape of orbital

A. n

B. m_l

C. l

D. m_s

Answer:

Watch Video Solution

60. Write an activity which shows metal produces colour in flame.

A. Crimson red

B. Blue

C. Green

D. Apple green

Answer:

Watch Video Solution

61. When an electron jumps from higher energy state to lower energy state it _____ energy.

A. emits

B. absorbs

C. neither emit nor absorbs

D. none of these

Answer:

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62. It is not possible to determine precisely both the position and the momentum or velocity) of a small moving particle (e.g. electron , proton, etc)

The above statements is known as :

A. Aufbau principle

B. Hund's rule

C. Pauli's exclusion principle

D. Heisenberg's uncertainty principle

Answer:

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63. Quantum mechanical model of an atom was developed

A. Neils Bohr

B. de Brogile

C. Heisenberg

D. Erwin Schrodinger

Answer:

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64. The space around the nucleus where the probability of finding an electron is maximum is called:

A. Orbit

B. Nucleus

C. Orbital

D. None of these

Answer:

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65. Orbital quantum gives _____

A. shape of orbital

B. size and energy of orbital

C. orientation of orbital

D. spin of electrons

Answer:

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66. Splitting of spectral lines in magnetic field is known as _____

A. magnetic

B. electric

C. both

D. None of these

Answer:

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67. The electronic configuration of chromium (Z=24) is

A. $(Ar)4s^2 3d^5$

B. $(Ar)4s^2 3d^4$

C. $(Ar)4s^1 3d^5$

D. $(Ar)4s^1 3d^6$

Answer:

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68. Noble gases belong to the following group

A. V A

B. VI A

C. VII A

D. VIII A

Answer:

Watch Video Solution

69. (A): Radio waves can be polarized

(R): Sound waves in air longitudinal in nature.

A. Micro

B. Radio

C. UV

D. IR

Answer:

Watch Video Solution

70. As ‘n’ increases size of the orbital _____

A. increases

B. decreases

C. does not change

D. None of these

Answer:

Watch Video Solution

71. What is the value of Planck's constant

A. $6.62 \times 10^{-34} J/s$

B. $6.62 \times 10^{-27} J/s$

C. $6.62 \times 10^{-20} J/s$

D. $6.62 \times 10^{-44} J/s$

Answer:

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72. Which principle/rule states that two electrons of the same atom can't have all 4 same quantum numbers ?

A. Pauli's exclusion principle

B. Aufbau principle

C. Hund's rule

D. Flemming's left hand rule

Answer:

Watch Video Solution

73. The maximum number of electrons present in K shell are

A. 2

B. 4

C. 6

D. 8

Answer:

Watch Video Solution

74. Principal Quantum number 3 refers to

A. M - main shell

B. f - sub shell

C. N - main shell

D. d - sub shell

Answer:

Watch Video Solution

75. The maximum number of electrons that can be accommodated in all the orbitals for which $l = 3$. Is

A. 6

B. 10

C. 14

D. 18

Answer:

Watch Video Solution

76. Aufbaur : lowest energy orbital :: Hund : .....

A. Exclusion principle

B. degenerate orbital

C. Quantum number

D. elliptical

Answer:

Watch Video Solution

77. The quantum number which explains about size and energy of the orbit or shell is

A. n

B. l

C. m_l

D. m_s

Answer:

Watch Video Solution

78. Find the odd one out.

1) $E = h\vartheta$ 2) $h = \frac{E}{J}$

3) $\vartheta = \frac{E}{h}$ 4) $h = E\vartheta$

A. 2

B. 1

C. 4

D. 3

Answer:

Watch Video Solution

79. what is the outer most electronic condfiguration of Na^+ ?

A. $1s^2 2s^2 2p^6 3s^1$

B. $1s^2 2s^2 2p^6$

C. $1s^2 2s^2 2p^{63} s^2 sp^6$

D. $1s^2 2s^2$ 2p^6 3s^2`

Answer:

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80. Which of the following statements is correct

A. The maximum number of unpaired electrons in a sub-shell is equal to 2l + 1.

B. The maxium value of magnetic moment for an atom with l=2 sub-shell is 3.9.

C. The total spin of $3d^6$ configuration is 3.

D. Both A and B

Answer:

Watch Video Solution

81. Which of the following conclusions cannot be drawn on the basis of Paulis principle ?

A. An orbital contains a maxium of 2 electrons

B. The electrons in an orbital possess opposite spins.

C. The maximum number of electrons in a shell is $2n^2$.

D. The maximum number of unpaired electrons in a sub-shell is equal to the number of orbitals in it.

Answer:

Watch Video Solution

82. Which of the following statements are true regarding an orbital ?

A. Orbital corresponds to stationary orbit of Bohr.

B. Orbital indicates the space with maximum probability of finding an electron.

C. Orbital contains electrons with parallel spins.

D. Orbitals of the same sub-shell are degenerate under normal conditions.

Answer:

Watch Video Solution

83. Choose the correct answer for the following.

Group - A		Group - B
i) Size and energy	( )	a) spin quantum number
ii) Shape of the orbital	( )	b) Principle quantum number
iii) Orientation of orbital with external magnetic field	( )	c) Angular momentum quantum number
iv) Spin of electron about its own axis	( )	d) Magnetic quantum number

A. i-a,ii-b,iii-c,iv-d

B. i-b,ii-c,iii-d,iv-a

C. i-b,ii-d,iii-c,iv-a

D. i-a,ii-c,iii-d,iv-b

Answer:

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84. Which of the following electronic configuration represents the violation of both Aufbaur principle and Hund's rule ?

A. `

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B. `

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C. `

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D. `

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Answer:

Watch Video Solution

85. Which of the following represent Px orbital ?

A.

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B. `

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C. `

(##BYD_PHY_SCI_X_P1_C06_E02_078_O03.png" width="30%">

D. `

(##BYD_PHY_SCI_X_P1_C06_E02_078_O04.png" width="30%">

Answer:

Watch Video Solution

86. Which of the following represent $d_{\times}^{2} - y^{2}$ orbital ?

A. `

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B. `

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C. `

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D.

(##BYD_PHY_SCI_X_P1_C06_E02_079_O04.png" width="30%">

Answer:

Watch Video Solution

87. Which of the following represent d_yz orbital ?

A. `

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B. `

(##BYD_PHY_SCI_X_P1_C06_E02_080_O02.png" width="30%">

C. `

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D. `

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Answer:

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88. How many values can l have for n = 4 ?

A. 3

B. 7

C. 5

D. 4

Answer:

Watch Video Solution

89. In $nl^{\times}$ corresponding letters represents :

n-represents principal quantum number

$\times$ - represents number of electrons in orbital.

l-represents number of orbitals.

l - represents the angular momentum quantum number.

A. c

B. a,b,c

C. a,b,d

D. b,c

Answer:

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90. Electrons in an orbital can be accommodates as follows :

The maxium number of electrons that can be accommodated in an orbital is 2.

the electrons have opposite spin in an orbital.

Low level energy orbitals filled first.

The maximum spin of an electrons is +1. Find out the correct statments

A. a,b

B. d

C. a,b,c

D. c

Answer:

Watch Video Solution

91. The number of electrons in a sub-shell is as follows :

s= 2 electrons

p = 6 electrons

d = 12 electrons

f = 14 electrons Pick out the correct statement.

A. a

B. c

C. a,d

D. a,b,d

Answer:

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92. Which of the following is defect in Bohr theory ?

A. It could not explain the spectrum in atoms containing more than one electron.

B. It could not explain fine structure of the spectrum.

C. It could not explain formation of chemical bonds.

D. All the above

Answer:

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93. Which of the following is wrong ?

A. Electromagnetic waves causes magnetic and electric fields

B. Light is not propogated in vacuum

C. Electric and Magnetic fields are perpendicular to each other

D. All electromagnetic radiations travel with same speed.

Answer:

Watch Video Solution

94. n = 2,l = 1, then the orbtial is represented as

A. 2s

B. 2p

C. 3s

D. 2d

Answer:

Watch Video Solution

95. If two orbitals have'same (n + 1) value then

A. The orbital with low 'n' value has highest energy

B. The orbital with more 'n' value has highest energy

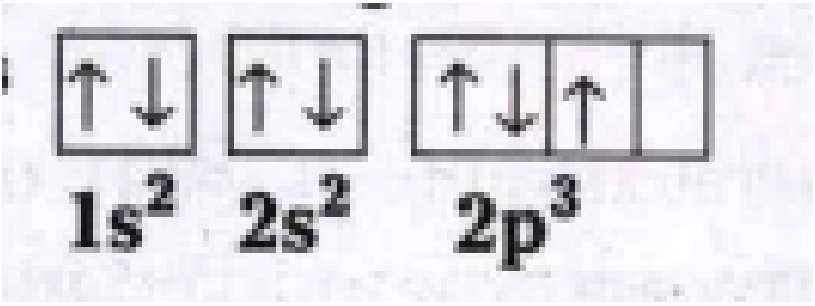
C. The orbital with low 'l' value has higest energy

D. All are correct

Answer:

Watch Video Solution

96. The electronic configuration of nitrogen in denoted as This violates



A. Aufabu's principle

B. Hund's principle

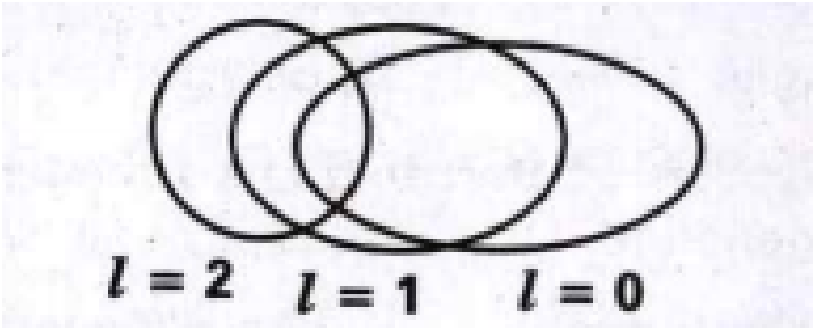
C. Pauli's principle

D. Aufbau and Hund's principle

Answer:

Watch Video Solution

97. For an atom Sommerfeld picture is



A. K shell

B. L shell

C. M shell

D. N shell

Answer:

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98. Which of the following is true according to quantum mechanical model of an atom?

A. It was proposed by Erwin Schrodinger.

B. Simultaneously the position and velocity of and electron cannot be be measured accurately.

C. Electrons are present in a particular region around the nucleus

D. All are correct

Answer:

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99. Principal quantum number is related to

A. Size of the orbit

B. Spin angular momentum

C. Orbital angular momentum

D. Orientation of orbital in space

Answer:

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100. Which of the following alloys contains Cu and Zn ?

A. `

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B. `

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C.

D.

Answer:

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101. n and 'l' values for some orbitals are given. Which of the following orbital has highest energy ?

A. 1. n = 2, l = 0

B. 2. n = 3, l= 1

C. 3. n = 4, l= 0

D. 4. n = 3,l= 2

Answer:

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102. Which of the following is violation of Pauli's exclusion principle ?

A. `

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B. `

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C. `

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D. `

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Answer:

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103. When electric charge vibrates _____ are produced.

A. electric waves

B. magnetic waves

C. electromagnetic waves

D. stationary waves

Answer:

Watch Video Solution

104. The range of wavelengths converging red colour to violet colour is called the _____

A. U.V. spectrum

B. Visible spectrum

C. I.R. spectrum

D. Line spectrum

Answer:

Watch Video Solution

105. Select the correct answer.

'Electromagnetic energy can be gained or lost in the manner of .... ' .

a) continous b) discrete

A. Ruther Ford

B. Neils Bohr

C. Einstein

D. Max Planck

Answer:

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Watch Video Solution

106. Which of the following is a failure of Bohr's atomic model?

A. splitting of line spectra

B. stationary orbit

C. emission spectrum

D. hydrogen spectrum

Answer:

Watch Video Solution

107. Contribution of Summerfield to be model of atom

A. stationary orbits

B. circular orbits

C. elliptical orbits

D. orbitals

Answer:

Watch Video Solution

108. The quantum number which explains about size and energy of the orbit or shell is

A. principal quantum number

B. angular momentum quantum number

C. magnetic quantum number

D. spin quantum number

Answer:

Watch Video Solution

109. If n=3, the main shell is _____

A. K

B. N

C. O

D. M

Answer:

Watch Video Solution

110. If, $n = 3$, the maximum value of l is:

A. 3

B. 4

C. 1

D. 2

Answer:

Watch Video Solution

111. The value of l for n = 2 are_____

A. 1,2

B. 0,1

C. 2,3

D. 0,1,2

Answer:

Watch Video Solution

112. The orientation of orbital in space relative to the other orbitals in the atom is known by _____

A. principal quantum number

B. angular momentum quantum number

C. magnetic quantum number

D. spin quantum number

Answer:

Watch Video Solution

113. For a given value of 'l' the number of integer values of m_l are_____

A. l - 1

B. l + 1

C. 2l+1

D. 2l-1

Answer:

Watch Video Solution

114. The clock wise or anticlockwise orientation of electron in an orbit is given by _____

A. n

B. l

C. m_l

D. m_s

Answer:

Watch Video Solution

115. Which of the following is not a correct set of quantum numbers?

A. $n = 1, l = 0, m_l = 0, m_s = -1/2$

B. $n = 2, l = 1, m_l = 0, m_s = +1/2$

C. $n = 0, l = 0, m_l = 0, m_s = +1/2$

D. $n = 3, l = 1, m_l = 0, m_s = +1/2$

Answer:

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116. When an electron moves from higher orbit _____ is produced.

A. emission spectrum

B. Absorption spectrum

C. a-particle

D. none

Answer:

Watch Video Solution

117. What is Aufbau principle ?

A. `

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B. `

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C. `

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D. `

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Answer:

Watch Video Solution

118. The maximum number of electrons in a sub-shell is given by the expression.

A. 2l

B. 2l + 1

C. 2(2l+1)

D. 3

Answer:

Watch Video Solution

119. _____ quantum number gives spin of electrons about their own axes.

A. Spin

B. Magnetic

C. Angular momentum

D. Principle

Answer:

Watch Video Solution

120. If the value of principal quantum number is 3, the total possible values for magnetic quantum number will be

A. 1 and -1

B. $+1/2 \text{ and } -1/2$

C. $-3, +3$

D. 0 and 1

Answer:

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121. If both spin quantum number values are positive then the spins are _____

A. parallel

B. Perpendicular

C. clock-wise

D. anti-clock-wise

Answer:

Watch Video Solution

122. What is the meaning of word 'Aufbau'?

A. making up

B. dismantling

C. building up

D. breaking up

Answer:

Watch Video Solution

123. The relative energies diagram of atomic orbitals is given by _____

A. Bohr

B. Moeller

C. Brogile

D. Schrodinger

Answer:

Watch Video Solution

124. The orbitals with same energy from the following

A. degenerate

B. equilateral

C. similar

D. circular

Answer:

Watch Video Solution

125. ns^2 configuration is called.....configuration.

A. 1. octet

B. 2. quadra

C. 3. duplet

D. 4. tetra

Answer:

Watch Video Solution

126. The electronic configuration of copper is

A. $(Ar)4s^1 3d^9$

B. $(Ar)4s^1 3d^5$

C. $(Ar)4s^2 d^8$

D. $(Ar)4s^1 3d^{10}$

Answer:

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127. Noble gases are inert - explain.

A. efficient

B. inert

C. reactive

D. thick

Answer:

Watch Video Solution

128. An outer most shell which has 8 electrons is said to possess in ..... configuration.

A. octet

B. quadra

C. duplet

D. tetra

Answer:

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129. Give the equation which give electromagnetic energy (light) that can have only certain discrete energy values .

A. $E = hv$

B. $c = v\lambda$

C. $E = \Delta mc^2$

D. $2n^2$

Answer:

Watch Video Solution

130. Which one of the following electromagnetic radiations have the smallest wavelength

A. a - rays

B. X - rays

C. Cosmic rays

D. UV rays

Answer:

Watch Video Solution

131. Atomic spectrum of hydrogen is a _____ spectrum.

A. line

B. band

C. continuous

D. visible

Answer:

Watch Video Solution

132. Stationary states are also called as _____

A. shells

B. energy shells

C. sub-stationary shells

D. sub-energy levels

Answer:

Watch Video Solution

133. What is the shape of s-orbital ?

A. dumb-bell

B. double dumb-bell

C. spherical

D. no shape

Answer:

Watch Video Solution

134. What is the shape of d-orbital ?

A. dumb-bell

B. double dumb-bell

C. spherical

D. no shape

Answer:

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135. How wavelength and velocity of light related?

A. $\nu = \lambda$

B. $c = \frac{\nu}{\lambda}$

C. $c = \frac{\nu}{\lambda}$

D. $c = \nu + \lambda$

Answer:

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136. Electromagnetic energy is characterized by _____

A. wavelength

B. frequency

C. A & B

D. no character

Answer:

Watch Video Solution

137. _____ colour flame is produced with cupric chloride.

A. Red

B. Blue

C. Violet

D. Green

Answer:

Watch Video Solution

138. .....is an example for continuous spectrum.

A. Line spectrum

B. Rainbow

C. band spectrum

D. No example

Answer:

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139. _____produce line spectrum.

A. Solidations

B. Liquid atoms

C. Gaseous atoms

D. Any atom

Answer:

Watch Video Solution

140. _____produce line spectrum.

A. Atoms

B. Molecules

C. Electrons are present in a particular region around the nucleus

D. Protons

Answer:

Watch Video Solution

141. An atom or molecule having lowest possible energy is said to be in its _____

A. ground

B. excited

C. melting

D. freezing

Answer:

Watch Video Solution

142. Line spectrum is characteristic of

A. discrete

B. continuous

C. band

D. split

Answer:

Watch Video Solution

143. Which is used to identify unknown atoms ?

A. atomic spectra

B. band theory

C. spectroscope

D. spectrography

Answer:

Watch Video Solution

144. When an electron jumps from a lower energy state to higher energy state it ____ energy.

A. loses

B. emits

C. absorbs

D. no change

Answer:

Watch Video Solution

145. Principal quantum number is related to

A. size and shape

B. size and energy

C. size and orientation

D. orientation and spin

Answer:

Watch Video Solution

146. The maximum value for ' l ' is _____

A. 1

B. 2

C. (n-1)

D. (n+1)

Answer:

Watch Video Solution

147. Orbital quantum gives _____

A. angular momentum quantum number

B. principal quantum number

C. magnetic quantum number

D. spin quantum number

Answer:

Watch Video Solution

148. Splitting of spectral lines in magnetic field is known as _____

A. starck

B. streaking

C. screening

D. zeeman

Answer:

Watch Video Solution

149. The orientation of orbitals is given by _____ quantum number.

A. principle

B. angular momentum

C. magnetic

D. spin

Answer:

Watch Video Solution

150. The anti-parallel spin of electron is represented by_____

A. -1/2

B. 0

C. -3

D. +1/2

Answer:

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151. You know that the distribution of electrons in shells, sub-shells and orbitals in an atom is known as electronic configuration.

Now answer the question by using the electronic configuration $1s^2 2s^2 2p^1$

How many sub-shells are there ? What are they ?

A. atomic structure

B. electronic configuration

C. chemical formula

D. accommodation of electrons

Answer:

Watch Video Solution

152. "No two electrons of the same atom can have all four quantum numbers the same". Name the above principle.

A. Aufbau principle

B. Hund's rule

C. Bohr's quantum condition

D. Pauli's principle

Answer:

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153. The maximum number of electrons in a sub-shell is given by the expression.

A. 2n

B. n^2

C. $2n^2$

D. $4n^2$

Answer:

Watch Video Solution

154. Electron enters into_____ energy level, according to Aufbau principle.

A. lowest

B. highest

C. any energy level available for i

D. no energy level

Answer:

Watch Video Solution

155. What happens when electrons jumps from lower energy level to higher energy level ?

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156. When do electron will emit the energy ?

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157. If the electron falls from n = 3 to n = 2, in hydrogen atom then emitted energy is

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158. What is emission test?

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159. Write postulates and limitations of Bohr Hydrogen atomic model.

Watch Video Solution

160. What are quantum numbers ?

Watch Video Solution

161. What are quantum numbers ?

Watch Video Solution

162. Magnetic quantum number is related to

Watch Video Solution

163. Which quantum number describes the orientation of the orbital in space ?

Watch Video Solution

164. Why does spin quantum number introduced ?

Watch Video Solution

165. What is Aufbau principle ?

Watch Video Solution

166. Is there any rule to find the maximum number of electrons in any shell ?

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167. How can electronic configuration be built up in ground state ?

Watch Video Solution

168. Which of the following orbitals are filled progressively in the transition elements

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169. When two sub-shells have same value of n + l, where do electrons to then ?

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170. Why do we cann't see radio waves with our naked eyes ?

Watch Video Solution

171. Which type of model of atom Erwin Schrodinger developed ?

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172. When n = 2, l = 1, how many orbitals are there ? Name the sub-shell which they belongs to ? How many maximum electrons can occupy this sub-shell ?

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173. Write postulates and limitations of Bohr Hydrogen atomic model.

Watch Video Solution

174. Orbitals having equal energies are

A. Atomic orbitals

B. Hybrid orbitals

C. Degenerate orbitals

D. Pure orbitals

Answer:

Watch Video Solution

175. Which of the following spectrum is look like a finger prints ?

A. Visible spectrum

B. Line spectrum

C. Band spectrum

D. All the above

Answer:

Watch Video Solution

176. Splitting of spectral lines in the presence of electric field is called _____

A. Zeeman effect

B. Stark effect

C. Photo electric effect

D. Quantum effect

Answer:

Watch Video Solution

177. For Manganese atom, assuming that Hund's rule is to valid for l=2 subshell predict the unpaired electrons and elctron pairs in that subshell of atom

A. 5,1

B. 5,0

C. 1,2

D. 1,3

Answer:

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178. Degrenerate orbitals means

A. A set of orbitals of any energy level

B. d - orbitals

C. Orbitals with a higher energy

D. s,p and d - orbitals

Answer:

Watch Video Solution

179. Velocity of light in vacuum is given by the formula.....

A. $c = \frac{v}{\lambda}$

B. $c = \frac{\lambda}{v}$

C. $c = \nu\lambda$

D. c=hf

Answer:

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180. Filling of electrons in an orbital of sub-shells is given by

A. Pauli's rule

B. Aufbau's rule

C. Hund's rule

D. All the above

Answer:

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181. E = hν is given by

A. Bohr

B. Sommerfeld

C. Planck

D. Rutherford

Answer:

Watch Video Solution

182. Identify the wrong set of quantum numbers from the following.

A. n=2,l=1,m=0,s=+1/2

B. n=1,l=0,m=0,s=-1/2

C. n=2,l=2m=+,s=-1/2

D. n=3,l=1m=+2,s =+1/2

Answer:

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183. Electron emits energy if it jumps form .....to .....energy state

A. higher,lower

B. lower,higher

C. in the same energy state

D. excited state, ground

Answer:

Watch Video Solution

184. Elliptical orbits were introduced by.....

A. Bohr

B. Max Planck

C. Erwin Schrodinger

D. Sommerfeld

Answer:

Watch Video Solution

185. Sommerfeld added.....elloptical orbits to each Bohr's circular orbit

A. n

B. n + 1

C. 2(2n +1)

D. n - 1

Answer:

Watch Video Solution

186. An orbital with m = +3 has an unpaired electron. If it is the only unpaired electron in the atom which of the following electronic arrangement corresponds to that atom ?

A. $4d^1 4f^1 5s^2$

B. $(K)4d^2 5s^2$

C. $(Kr)5d^0 4f^{16} s^2$

D. $(Xe)4f^{25} s^2$

Answer:

Watch Video Solution

187. What is the electronic configuration of Ca ?

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$

$[Ar] 4s^2$

$[Ne] 3s^2 3p^6 4s^2$

$1s^2 2s^2 2p^6 3s^2 5s^2 3p^6$

A. a

B. b,c

C. a,c

D. a,b,c

Answer:

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188. Wite two sentences about the wavelengths of colours in rainbow ?

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189. How can you say that VIBGYOR have different wavelength ?

Watch Video Solution

190. Where do we see the radio waves ?

Watch Video Solution

191. Why does on element emit light, when it is heated ?

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