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SSC-I NATIONAL BOOK FOUNDATION FBISE

CHEMISTRY TEST - CHAPTER 3: ATOMIC STRUCTURE

Name:		Roll No.		Section:

Total Time: 2:30 Hour
Time Allowed: 150 Minutes

Total Marks: 150

PAPER OBJECTIVE
SECTION-A (MARKS 150)

NOTE: Section-A is compulsory. All parts of this section are to be answered on these pages and handed over to the center superintendent. Deleting / overwriting is not allowed. Do not use lead pencil.

Q.1 Fill the relevant bubble for each part. All parts carry one mark.

Questions	A	B	C	D	A B C D
1. The atom has a central _____ containing neutrons and protons.	Cloud	Shell	Nucleus	Orbital	○○●○
2. Electrons in an atom are found in:	Shells	Protons	Neutrons	The nucleus	●○○○
3. Orbits or shells are the _____ levels of electrons.	Charge	Colour	Mass	Energy	○○○●
4. A larger shell implies _____ energy.	Equal	Lower	Higher	Zero	○○●○
5. Protons and neutrons in the nucleus are held together by the:	Electrostatic force	Strong nuclear force	Gravity only	Magnetic force	○●○○
6. John Dalton presented his atomic theory in:	1927	1803	1911	1913	○●○○
7. Dalton described atoms as tiny _____ particles.	Indivisible	Charged	Divisible	Hollow	●○○○
8. According to Dalton, atoms of a particular element are:	Radioactive	Identical	Different	Charged	○●○○
9. According to Dalton, atoms can neither be created nor:	Counted	Heated	Seen	Destroyed	○○○●
10. Experiments in the 1850s showed that the atom is:	A solid sphere	Indivisible	Not real	Divisible	○○○●
11. Rutherford performed his gold foil experiment in:	1913	1911	1927	1803	○●○○
12. Rutherford used alpha particles obtained from the disintegration of:	Radium only	Polonium	Uranium only	Carbon	○●○○

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Questions	A	B	C	D	A B C D
13. Alpha particles are:	Neutrons	Electrons	Helium nuclei	Protons	○○●○
14. Alpha particles are _____ charged.	Doubly positively	Singly positively	Negatively	Neutral	●○○○
15. In Rutherford's experiment, most alpha particles:	Were deflected 90°	Were reflected	Passed straight through	Were absorbed	○○●○
16. The fact that most particles passed through shows that most of an atom is:	Dense	Empty space	Solid	Charged	○●○○
17. Deflection of a few alpha particles shows the nucleus is:	Positively charged	Neutral	Empty	Negatively charged	●○○○
18. About one in _____ alpha particles was deflected through more than 90°.	10	100	1000	1 million	○○○●
19. Rutherford proposed which model for the atom?	Plum pudding model	Quantum model	Solid sphere model	Planetary model	○○○●
20. Rutherford named the small, dense positive region the:	Shell	Nucleus	Orbit	Orbital	○●○○
21. In Rutherford's model, the electron circles are called:	Orbitals	Orbits	Shells of protons	Nuclei	○●○○
22. A defect of Rutherford's model is that electrons would:	Leave the atom	Become neutrons	Become protons	Spiral into the nucleus	○○○●
23. Bohr proposed his atomic model in:	1803	1911	1927	1913	○○○●
24. Bohr's model explains the line spectrum of the _____ atom.	Hydrogen	Helium	Oxygen	Carbon	●○○○
25. In Bohr's model, each orbit has a fixed:	Energy	Mass	Charge	Colour	●○○○
26. The farther an electron is from the nucleus, the _____ energy it has.	Same	Zero	More	Less	○○●○
27. Light is absorbed when an electron jumps to a _____ energy orbit.	Same	Lower	Nuclear	Higher	○○○●
28. Light is emitted when an electron falls to a _____ energy orbit.	Same	Nuclear	Lower	Higher	○○●○
29. In Bohr's model, an electron in a fixed orbit _____ energy.	Radiates	Absorbs only	Does not radiate	Doubles	○○●○
30. The value of Planck's constant is:	9.11×10^{-31} kg	6.626×10^{-34} J s	3×10^{8} m/s	1.6×10^{-19} C	○●○○

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Questions	A	B	C	D	A B C D
31. The energy of emitted light equals the _____ between the two orbit energies.	Product	Difference	Ratio	Sum	○●○○
32. The Bohr model does not show the _____ aspect of an atom.	Electrical	Two-dimensional	Three-dimensional	Nuclear	○○●○
33. The current model of the atom is the:	Planetary model	Dalton model	Bohr model	Quantum mechanical model	○○○●
34. Regions where electrons are likely to be found are called:	Nuclei	Orbits	Orbitals	Shells of protons	○○●○
35. The uncertainty principle was formulated by:	Rutherford	Niels Bohr	Dalton	Werner Heisenberg	○○○●
36. The Heisenberg principle was formulated in:	1927	1911	1913	1803	●○○○
37. The Heisenberg principle states that it is impossible to simultaneously determine the exact _____ of an electron.	Location and trajectory	Charge and mass	Spin and colour	Colour and size	●○○○
38. An orbital is the region where the electron is found about _____ of the time.	10%	50%	5%	95%	○○○●
39. Louis de Broglie proposed the _____ nature of electrons.	Single	Dual (wave-particle)	Neutral	Charged	○●○○
40. De Broglie was a _____ physicist.	British	French	Danish	German	○●○○
41. De Broglie proposed his idea in:	1924	1913	1803	1927	●○○○
42. The de Broglie hypothesis was confirmed experimentally by:	Davisson and Germer	Bohr	Dalton	Rutherford	●○○○
43. Davisson and Germer confirmed the wave behaviour of the electron in:	1911	1924	1927	1913	○○●○
44. Protons and neutrons are collectively called:	Ions	Nucleons	Isotopes	Electrons	○●○○
45. The mass of an atom is concentrated in the:	Nucleus	Electron cloud	Orbitals	Shells	●○○○
46. Protons are _____ charged.	Doubly	Negatively	Neutral	Positively	○○○●
47. Neutrons are:	Positive	Negative	Doubly positive	Neutral	○○○●

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Questions	A	B	C	D	A B C D
48. The nucleus has no _____ charge.	Positive	Neutral	Negative	Net	○○●○
49. The strong nuclear force exists between neutron-neutron, proton-proton and:	None	Neutron-proton	Electron-neutron	Electron-proton	○●○○
50. The relative charge of a proton is:	0	+1	−1	+2	○●○○
51. The relative charge of a neutron is:	0	−1	+1	+2	●○○○
52. The relative charge of an electron is:	+1	0	−2	−1	○○○●
53. The relative mass of a proton is approximately:	2 amu	1/1836 amu	0 amu	1 amu	○○○●
54. The relative mass of a neutron is approximately:	2 amu	1/1836 amu	1 amu	0 amu	○○●○
55. The mass of a proton is about:	1 kg	9.11×10^{-31} kg	1.6726×10^{-27} kg	1.6749×10^{-31} kg	○○●○
56. The mass of an electron is about:	1 g	9.11×10^{-31} kg	1.6749×10^{-27} kg	1.6726×10^{-27} kg	○●○○
57. Between two charged plates, protons are deflected toward the:	Negative plate	Both plates	Positive plate	Neither plate	●○○○
58. Between two charged plates, electrons are deflected toward the:	Neither plate	Both plates	Positive plate	Negative plate	○○●○
59. Between two charged plates, neutrons:	Stop	Go straight ahead	Bend toward positive	Bend toward negative	○●○○
60. At the same speed, _____ are deflected more strongly.	Protons	Neutrons	Electrons	Nuclei	○○●○
61. Atoms are electrically neutral because the number of protons equals the number of:	Isotopes	Nucleons	Electrons	Neutrons	○○●○
62. The atomic number is the number of _____ in the nucleus.	Electrons only	Nucleons	Protons	Neutrons	○○●○
63. The symbol for atomic number is:	Z	A	N	M	●○○○
64. The atomic number of hydrogen is:	2	1	0	3	○●○○

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Questions	A	B	C	D	A B C D
65. The element with 6 protons is:	Nitrogen	Oxygen	Sodium	Carbon	○○○●
66. Each nitrogen atom has _____ protons.	14	7	6	8	○●○○
67. Each oxygen atom has _____ protons.	8	6	16	7	●○○○
68. The elements in the periodic table are arranged on the basis of:	Density	Colour	Atomic number	Mass number	○○●○
69. The proton number determines the _____ of an element.	Shape	Identity	Age	Colour	○●○○
70. The total number of protons and neutrons is the:	Charge	Mass number	Atomic number	Valency	○●○○
71. The mass number is also known as the:	Charge number	Electron number	Proton number	Nucleon number	○○○●
72. Number of neutrons =	Atomic number × mass number	Mass number + atomic number	Mass number − atomic number	Atomic number − mass number	○○●○
73. An element with atomic number 17 and mass number 35 has how many neutrons?	18	17	52	35	●○○○
74. An element with atomic number 23 and mass number 56 has how many neutrons?	33	79	23	56	●○○○
75. An atom with atomic number 23 has how many electrons (neutral)?	56	33	23	79	○○●○
76. Radioactivity can change the number of _____ and so the identity of an atom.	Electrons only	Shells	Orbits	Protons	○○○●
77. Carbon-14 decays to:	Carbon-12	Boron-10	Nitrogen-14	Oxygen-16	○○●○
78. Uranium-238 finally decays to stable:	Lead-206	Carbon-12	Thorium-234	Radon	●○○○
79. In 1961, _____ was chosen as the standard for atomic masses.	Uranium-235	Hydrogen-1	Oxygen-16	Carbon-12	○○○●
80. The mass of a C-12 atom is exactly:	6 amu	14 amu	12 amu	1 amu	○○●○
81. One amu is exactly _____ of the mass of one C-12 atom.	1/24	1/2	1/12	1/6	○○●○

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Questions	A	B	C	D	A B C D
82. The instrument used to accurately determine atomic masses is the:	Thermometer	Microscope	Telescope	Mass spectrometer	○○○●
83. The relative atomic mass of oxygen is about:	26.9815 amu	22.9898 amu	1.008 amu	15.9994 amu	○○○●
84. The relative atomic mass of sodium is about:	26.9815 amu	15.9994 amu	22.9898 amu	12 amu	○○●○
85. The relative atomic mass of aluminium is about:	22.9898 amu	26.9815 amu	15.9994 amu	12 amu	○●○○
86. The word isotope was first used by:	Soddy	Bohr	Rutherford	Dalton	●○○○
87. Isotopes are atoms of an element with the same atomic number but different:	Charge	Mass number	Atomic number	Symbol	○●○○
88. Isotopes differ in the number of:	Orbits	Neutrons	Electrons	Protons	○●○○
89. Isotopes are chemically alike but differ in their _____ properties.	Physical	Atomic	Chemical	Nuclear only	●○○○
90. The discovery of isotopes contradicted Dalton's idea that atoms of an element are:	Divisible	Charged	Neutral	Identical	○○○●
91. Hydrogen has how many isotopes?	Three	Two	Five	Four	●○○○
92. Hydrogen-1 is also called:	Tritium	Heavy hydrogen	Protium	Deuterium	○○●○
93. Protium has _____ neutrons.	0	2	3	1	●○○○
94. Deuterium has _____ neutron(s).	3	0	2	1	○○○●
95. Tritium has _____ neutrons.	3	0	1	2	○○○●
96. Water containing deuterium is called:	Heavy water	Mineral water	Hard water	Soft water	●○○○
97. Tritium is:	Non-existent in atoms	Radioactive	Stable	Abundant	○●○○
98. Carbon has how many isotopes (as listed in the book)?	Four	Five	Two	Three	○○○●

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Questions	A	B	C	D	A B C D
99. Carbon-12 has _____ neutrons.	12	7	6	8	○○●○
100. Carbon-13 has _____ neutrons.	7	13	6	8	●○○○
101. Carbon-14 has _____ neutrons.	6	8	7	14	○●○○
102. The natural abundance of C-12 is about:	50%	0.009%	98.8%	1.1%	○○●○
103. Chlorine has how many natural isotopes?	Two	Four	One	Three	●○○○
104. Chlorine-35 has _____ neutrons.	20	18	35	17	○●○○
105. Chlorine-37 has _____ neutrons.	17	20	37	18	○●○○
106. Chlorine-35 and chlorine-37 both have _____ protons.	18	20	17	35	○○●○
107. Chlorine-35 occurs in nature to about:	75%	50%	10%	25%	●○○○
108. Uranium has isotopes with mass numbers 234, 235 and:	240	236	238	239	○○●○
109. The most abundant uranium isotope is:	U-233	U-238	U-235	U-234	○●○○
110. When U-238 decays to thorium-234, it emits an:	Neutron	Alpha particle	Beta particle	Gamma ray	○●○○
111. The relative atomic mass is the _____ of isotopic masses.	Product	Sum	Difference	Weighted average	○○○●
112. The relative atomic mass of carbon, with natural isotopes, is about:	13 amu	14 amu	6 amu	12.0003 amu	○○○●
113. Iodine-131 is used as a tracer in diagnosing _____ problems.	Kidney	Heart	Thyroid	Brain	○○●○
114. Sodium-24 is used to trace the flow of:	Water	Air	Oil	Blood	○○○●
115. Iodine-123 is used to image the:	Lung	Brain	Bone	Heart	○●○○

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Questions	A	B	C	D	A B C D
116. Cobalt-60 is used to irradiate:	Cancer cells	Bones	Wood	Water	●○○○
117. Carbon-14 is used to trace the path of carbon in:	Photosynthesis	Respiration	Digestion	Combustion	●○○○
118. Sulphur-35 was used to determine the structure of the _____ ion.	Carbonate	Thiosulphate	Sulphate	Sulphite	○●○○
119. Carbon-14 is used to estimate the _____ of carbon-containing substances.	Age	Colour	Charge	Mass	●○○○
120. The process of estimating the age with C-14 is called:	Carbon dating	Carbon fixing	Carbon cycling	Carbon capture	●○○○
121. After death, organisms no longer pick up:	Oxygen	C-12	Water	C-14	○○○●
122. Cations are _____ charged ions.	Neutrally	Negatively	Doubly	Positively	○○○●
123. A cation forms when an atom _____ electrons.	Gains	Shares	Splits	Loses	○○○●
124. Cations are usually formed from _____ atoms.	Non-metal	Noble gas	Metal	Hydrogen only	○○●○
125. Anions are _____ charged ions.	Negatively	Positively	Doubly positive	Neutral	●○○○
126. An anion forms when an atom _____ electrons.	Gains	Loses	Splits	Shares	●○○○
127. Sodium belongs to Group _____ of the periodic table.	IIA	IA	VIA	VIIA	○●○○
128. Magnesium belongs to Group _____.	VIA	IIA	IA	VIIA	○●○○
129. A sodium atom forms the ion:	Na^-	Na^+	Na^{2+}	Na^{2-}	○●○○
130. Oxygen has how many electrons in its valence shell?	Two	Eight	Seven	Six	○○○●
131. An oxygen atom becomes the ion:	O^-	O^{2+}	O^{2-}	O^+	○○●○
132. Fluorine has _____ valence electrons.	1	6	8	7	○○○●

Questions	A	B	C	D	A B C D
133. A fluorine atom becomes the ion:	F^{2+}	F^{2-}	F^{-}	F^{+}	○○●○
134. The K shell corresponds to n =	1	2	4	3	●○○○
135. The L shell corresponds to n =	2	3	1	4	●○○○
136. The M shell corresponds to n =	3	4	1	2	●○○○
137. The L shell has how many sub-shells?	Three	One	Two	Four	○○●○
138. The M shell has the sub-shells:	1s	2s and 2p	3s only	3s, 3p and 3d	○○○●
139. The N shell has how many sub-shells?	Four	One	Two	Three	●○○○
140. The maximum number of electrons in the s sub-shell is:	10	14	2	6	○○●○
141. The maximum number of electrons in the d sub-shell is:	10	2	14	6	●○○○
142. The maximum number of electrons in the f sub-shell is:	6	2	10	14	○○○●
143. The correct increasing order of energy is:	2s < 1s < 2p	3d < 4s < 3p	1s < 2p < 2s < 3s	1s < 2s < 2p < 3s < 3p < 4s < 3d	○○○●
144. The Aufbau principle states that electrons fill the _____ energy sub-shell first.	Highest	Any	Middle	Lowest	○○○●
145. The electronic configuration of sodium (Z = 11) is:	$1s^2\ 2s^2\ 2p^5\ 3s^2$	$1s^2\ 2s^1\ 2p^6\ 3s^2$	$1s^2\ 2s^2\ 2p^6\ 3s^1$	$1s^2\ 2s^2\ 2p^6\ 3s^2$	○○●○
146. In $^{24}_{12}Mg^{2+}$, the number 24 is the:	Group number	Mass number	Charge	Atomic number	○●○○
147. In $^{24}_{12}Mg^{2+}$, the number 12 is the:	Charge	Mass number	Atomic number	Group number	○○●○
148. In $^{24}_{12}Mg^{2+}$, the charge is:	−2	+2	+24	+12	○●○○
149. Which sub-shell can accommodate 6 electrons?	p	f	d	s	●○○○

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Questions	A	B	C	D	A B C D
150. Which orbital is lower in energy: 2s or 2p?	Equal	2p	Cannot say	2s	○○○●

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