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HSSC-I NATIONAL BOOK FOUNDATION FBISE

CHEMISTRY TEST - CHAPTER 5: STATES AND PHASES OF MATTER

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. According to the kinetic molecular theory of liquids, liquid molecules:	do not move at all	are fixed in position	are in contact and can slide past each other	are very far apart	○○●○
2. The motion of molecules in a liquid is limited because of their:	large spaces	low density	close packing	zero attraction	○○●○
3. Compared with gas molecules, the attractive forces between liquid molecules are:	smaller	greater	zero	equal	○●○○
4. The attractive forces between liquid molecules are:	not strong enough to hold them in fixed positions	absent	stronger than in solids	strong enough to fix them in position	●○○○
5. At constant temperature, the average kinetic energy of liquid molecules is:	equal to that of gas molecules	zero	double that of gas molecules	half that of gas molecules	●○○○
6. Diffusion in liquids is slow because liquid molecules:	are far apart	do not move	are closely packed so collisions restrict movement	have no kinetic energy	○○●○
7. A drop of ink spreads slowly in water because of:	absence of motion	small spaces between water molecules	large spaces between water molecules	high temperature	○●○○
8. Liquids cannot be compressed significantly because their molecules are:	fixed in position	far apart	already in close contact	without kinetic energy	○○●○
9. An increase in pressure from one to two atmospheres reduces the volume of water by about:	0.0045 per cent	4.5 per cent	50 per cent	10 per cent	●○○○
10. The same increase in pressure reduces the volume of a gas by up to about:	0.5 per cent	0.0045 per cent	5 per cent	50 per cent	○○○●
11. Liquids expand on heating because the:	intermolecular forces between them decrease	molecules become smaller	molecules become heavier	number of molecules increases	●○○○
12. On cooling, the volume of a liquid decreases because molecules:	become lighter	lose their mass	move with lower speed and attract more strongly	move faster	○○●○
13. Physical properties of liquids such as boiling point and viscosity depend upon the:	number of neutrons	mass number	strength of intermolecular forces	colour of the liquid	○○●○
14. Intermolecular forces are the forces of attraction between:	protons and electrons	atoms in a molecule	individual molecules or particles of matter	nuclei within an atom	○○●○

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Questions	A	B	C	D	A B C D
15. The spontaneous change of a liquid into its vapour at the surface of the liquid at a given temperature is called:	sublimation	evaporation	condensation	fusion	○●○○
16. Evaporation takes place:	only at the boiling point	at all temperatures	only in closed containers	only at the freezing point	○●○○
17. Evaporation causes cooling because:	heat is released	high-energy molecules leave and the average kinetic energy of the liquid decreases	molecules condense on the surface	low-energy molecules leave the liquid	○●○○
18. When the surface area of a liquid increases, the rate of evaporation:	remains the same	increases	becomes zero	decreases	○●○○
19. Evaporation is slower in liquids that have:	strong intermolecular forces	high vapour pressure	weak intermolecular forces	low boiling points	●○○○
20. With a rise in temperature, the rate of evaporation:	increases	becomes zero	remains constant	decreases	●○○○
21. Gasoline and ethyl alcohol evaporate faster than water because their intermolecular forces are:	hydrogen bonds	stronger	weaker	ionic bonds	○○●○
22. High humidity makes us feel hotter because:	water vapour is cold	the air temperature drops	sweat becomes hotter	evaporation of sweat becomes difficult	○○○●
23. The coming back of vapour molecules to the liquid surface is called:	fusion	condensation	evaporation	sublimation	○●○○
24. In a closed container, the state in which the rate of evaporation equals the rate of condensation is called:	static equilibrium	boiling	dynamic equilibrium	melting	○○●○
25. The pressure exerted by the vapour in equilibrium with its liquid at a given temperature is called:	atmospheric pressure	vapour pressure	partial pressure	osmotic pressure	○●○○
26. Vapour pressure of a liquid is independent of the:	temperature	nature of the liquid	amount of liquid and volume of the container	intermolecular forces	○○●○
27. The surface area of a liquid has ___ effect on its vapour pressure.	a large	no	a decreasing	a doubling	○●○○
28. Vapour pressure of a liquid increases with increasing:	amount of liquid	volume of the container	surface area only	temperature	○○○●
29. At a given temperature, liquids with stronger intermolecular forces have:	equal vapour pressure	higher vapour pressure	zero vapour pressure	lower vapour pressure	○○○●
30. Which liquid has the highest vapour pressure at 20 °C according to the examples in the book?	Isopentane	Benzene	Glycerol	Water	●○○○
31. Glycerol has a very low vapour pressure at 20 °C because of:	weak intermolecular forces	strong intermolecular forces	its low molar mass	its low density	○●○○

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Questions	A	B	C	D	A B C D
32. The vapour pressure of water at 100 °C is:	760 torr	9.209 torr	23.7 torr	527.8 torr	●○○○
33. The vapour pressure of water at 0 °C is:	760 torr	4.579 torr	9.209 torr	23.7 torr	○●○○
34. The temperature at which the vapour pressure of a liquid becomes equal to the external pressure is called its:	boiling point	critical point	melting point	freezing point	●○○○
35. The boiling point of water at 760 torr is:	25 °C	69 °C	100 °C	98 °C	○○●○
36. Water boils at 25 °C when the external pressure is:	700 torr	1489 torr	760 torr	23.7 torr	○○○●
37. At the top of Mount Everest, water boils at a temperature:	higher than 100 °C	lower than 100 °C due to lower external pressure	equal to 100 °C	equal to 0 °C	○●○○
38. At Murree hills, where the external pressure is lower than at sea level, water boils at about:	98 °C	120 °C	100 °C	102 °C	●○○○
39. A pressure cooker cooks food quickly because it:	raises the boiling point of water by increasing pressure	lowers the pressure inside	removes the water	lowers the boiling point of water	●○○○
40. Glycerine is distilled under reduced pressure because under normal pressure it:	evaporates quickly at room temperature	reacts with air	freezes	decomposes at its high boiling point	○○○●
41. In vacuum distillation, the boiling point of a liquid is:	increased	decreased	doubled	unchanged	○●○○
42. During boiling, the temperature of the liquid remains constant because the heat supplied is used to:	increase pressure	decrease volume	increase kinetic energy	break the intermolecular forces	○○○●
43. The amount of heat required to convert one mole of a liquid into vapour at its boiling point is called the molar heat of:	solution	vaporization	sublimation	fusion	○●○○
44. The molar heat of vaporization of water is about:	6.02 kJ/mol	40.7 kJ/mol	100 kJ/mol	4.18 kJ/mol	○●○○
45. The molar heat of fusion of ice is about:	40.7 kJ/mol	60.2 kJ/mol	0.6 kJ/mol	6.02 kJ/mol	○○○●
46. The molar heat of fusion is the heat required to convert one mole of a solid into a liquid at its:	critical point	melting point	room temperature	boiling point	○●○○
47. The heat of vaporization is much greater than the heat of fusion because during vaporization:	the molecules become heavier	molecules move only a little	there is no energy change	molecules move very far apart, causing a large change in potential energy	○○○●
48. The resistance to flow of a liquid is called:	surface tension	vapour pressure	viscosity	density	○○●○

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Questions	A	B	C	D	A B C D
49. Which liquid is more viscous?	Honey	Benzene	Acetone	Water	●○○○
50. The SI unit of viscosity is:	poise	newton per metre	pascal second (Pa s)	joule per square metre	○○●○
51. The non-SI unit of viscosity is the:	dyne	pascal	poise	torr	○○●○
52. Liquids with small and compact molecules, such as water, acetone and benzene, have:	high viscosity	infinite viscosity	low viscosity	no viscosity	○○●○
53. Large and irregular molecules such as those of glycerine cause:	low viscosity	zero viscosity	high viscosity	high vapour pressure	○○●○
54. Viscosity of a liquid ___ with the strength of intermolecular forces.	stays constant	decreases	becomes zero	increases	○○○●
55. Water is more viscous than methanol mainly because of:	its lower boiling point	weaker intermolecular forces	extensive hydrogen bonding	its smaller molar mass	○○●○
56. Honey and syrup are easier to pour when hot because on heating their:	density increases	viscosity decreases	vapour pressure decreases	viscosity increases	○●○○
57. The viscosity of a liquid generally ___ with increasing temperature.	increases	decreases	doubles	remains constant	○●○○
58. Surface tension is the property of the surface of a liquid to:	behave as if a stretched membrane covers it	flow quickly	boil easily	evaporate quickly	●○○○
59. Surface tension arises because surface molecules experience:	an unbalanced inward pull	an outward pull	a balanced pull in all directions	no force	●○○○
60. Small liquid droplets are spherical because a sphere has:	the greatest surface area	the greatest volume only	no surface	the least surface area for a given volume	○○○●
61. The SI unit of surface tension is:	J mol^{-1}	Pa s	N m^{-1}	kg m^{-3}	○○●○
62. Surface tension of a liquid ___ with increasing temperature.	decreases	increases	stays constant	doubles	●○○○
63. Water has a higher surface tension than alcohols and ethers because of:	its low density	weak London forces	strong hydrogen bonding	its lower mass	○○●○
64. Which liquid has the highest surface tension?	Diethyl ether	Water	Hexane	Benzene	○●○○
65. Water has a low vapour pressure because of:	weak London forces	its small size	its low boiling point	hydrogen bonding	○○○●

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Questions	A	B	C	D	A B C D
66. Water has a high boiling point compared with other liquids of similar molar mass because of:	small molar mass	strong hydrogen bonding	weak dipole forces	its low density	○●○○
67. Water has a high heat of vaporization because:	its molecules are heavy	its molecules are non-polar	it has weak forces	much energy is needed to overcome its hydrogen bonds	○○○●
68. A student heats ethanol and water in the same way. Ethanol evaporates faster. This shows that water has:	lower boiling point	weaker intermolecular forces	lower density	stronger intermolecular forces	○○○●
69. The change in energy at constant pressure is called the change in:	density	entropy	enthalpy	volume	○○●○
70. The enthalpy change is expressed in:	kJ mol^{-1}	pascal	kg mol^{-1}	dm^3	●○○○
71. During a phase change, the temperature remains constant even when heat is added because:	the heat is used to change intermolecular forces	molecules lose mass	heat is lost to the surroundings	no heat is absorbed	●○○○
72. The enthalpy change for $H_2O(s) \rightarrow H_2O(l)$ is:	−40.7 kJ/mol	+6.02 kJ/mol	+40.7 kJ/mol	−6.02 kJ/mol	○●○○
73. The enthalpy change for $H_2O(l) \rightarrow H_2O(g)$ at the boiling point is:	−6.02 kJ/mol	−40.7 kJ/mol	+6.02 kJ/mol	+40.7 kJ/mol	○○○●
74. The study of glaciers and polar ice sheets depends upon:	the heat of vaporization of water	the viscosity of water	the heat of fusion of ice	the density of air	○○●○
75. The heat of fusion helps scientists predict the:	colour of glaciers	extent of ice melting and its effect on sea levels	boiling point of seawater	mass of the Earth	○●○○
76. Global warming is an important factor in the study of heat of fusion because it affects:	the colour of ice	the density of air	the melting of polar ice sheets	the freezing of salt	○○●○
77. In 1888 liquid crystals were discovered by:	Friedrich Reinitzer	Bohr	Pauling	Dalton	●○○○
78. The organic compound studied by Reinitzer was:	cholesteryl benzoate	sodium chloride	benzene	glycerol	●○○○
79. Cholesteryl benzoate becomes a milky (turbid) liquid at 145 °C and a clear liquid at:	160 °C	200 °C	100 °C	179 °C	○○○●
80. The turbid liquid state between the melting temperature and the clearing temperature is called:	solid state	plasma state	gaseous state	liquid crystal state	○○○●
81. Liquid crystals are made of:	long rod-like molecules	single ions	spherical atoms	noble gas atoms	●○○○
82. Which is NOT a type of liquid crystal?	Isotropic	Nematic	Cholesteric	Smectic	●○○○

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Questions	A	B	C	D	A B C D
83. Liquid crystals have the fluidity of liquids and the ___ of crystals.	low density	rigid shape	optical properties	high boiling point	○○●○
84. Liquid crystals are used in the displays of:	nuclear reactors	aircraft engines	water pipes	digital watches and laptops	○○○●
85. Cholesteric liquid crystals applied to the skin can be used to:	measure blood sugar	remove hair	locate veins, infections and tumours	cut tissue	○○●○
86. Nematic liquid crystals are used as solvents in:	electroplating	vacuum pumps	fractional distillation	NMR spectroscopy	○○○●
87. Polyester liquid crystals are used for:	food flavours	soaps	fire-resistant coatings and optical cables	fuel tanks	○○●○
88. Liquid crystals differ from ordinary liquids because they have:	some long-range molecular order	no flow	a fixed shape	no optical properties	●○○○
89. Liquid crystals differ from crystalline solids because they:	can flow like liquids	have fixed positions for atoms	are rigid	have sharp melting points only	●○○○
90. Pure liquids have a molecular arrangement that is:	random with no long-range order	crystalline	fixed	highly ordered in three dimensions	●○○○
91. Liquid crystals can change their molecular structure in response to:	colour only	temperature, electric field or pressure	mass	nuclear charge	○●○○
92. Gases do not have definite:	mass	pressure	temperature	shape and volume	○○○●
93. Gases have low densities because of:	strong attraction	large intermolecular spaces	small molecules only	fixed positions	○●○○
94. Gases show diffusion and effusion because of:	close packing	large spaces between their molecules	strong forces	fixed positions	○●○○
95. When gases are heated, the volume (at constant pressure):	becomes zero	increases	remains constant	decreases	○●○○
96. Gases exert pressure because of:	gravity on the container	chemical reactions	collisions of molecules with the walls of the container	attraction between molecules	○○●○
97. Gases are highly compressible because their particles are:	closely packed	far apart	fixed in position	attracted strongly	○●○○
98. Oxygen cylinders for hospitals are supplied by:	compressing the gas	freezing the gas	boiling the gas	expanding the gas	●○○○
99. CNG used in vehicles stands for:	compressed natural gas	chemical natural gas	cold natural gas	condensed natural gas	●○○○

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Questions	A	B	C	D	A B C D
100. LPG used for cooking stands for:	liquid pure gas	light petroleum gas	low pressure gas	liquefied petroleum gas	○○○●
101. The state of a substance is determined by the balance between:	kinetic energy of particles and intermolecular forces	density and charge	mass and volume	colour and odour	●○○○
102. In gases, the average kinetic energy of molecules is:	equal to zero	equal to attraction energy	smaller than the energy of attraction	larger than the average energy of attraction	○○○●
103. Pressure is defined as:	force per unit volume	mass per unit volume	force per unit area	energy per unit time	○○●○
104. Solids have a definite:	shape and volume	only volume	only shape	neither shape nor volume	●○○○
105. Particles of solids show only:	vibrational motion	random motion	translational motion	rotational motion only	●○○○
106. Solids are almost non-compressible because their particles are:	far apart	free to move	closely packed	attracted weakly	○○●○
107. Solids show negligible diffusion because their particles:	have no attraction	are far apart	move randomly	only vibrate about fixed positions	○○○●
108. Solids expand on heating because:	number of molecules increases	mass increases	molecules become larger	intermolecular attraction decreases and spaces increase	○○○●
109. In solids, intermolecular forces are:	minimum	maximum	equal to those of gases	zero	○●○○
110. Solids are classified into two types:	polar and non-polar	crystalline and amorphous	metallic and gaseous	hard and soft	○●○○
111. Which of the following is a crystalline solid?	Diamond	Glass	Plastic	Rubber	●○○○
112. Which of the following is an amorphous solid?	Ice	Glass	NaCl	Glucose	○●○○
113. Crystalline solids have:	a definite geometrical shape	no melting point	random arrangement of particles	no definite shape	●○○○
114. Amorphous solids have:	a long-range order	a sharp melting point	no sharp melting point	a definite geometric shape	○○●○
115. Amorphous solids are produced when a molten crystalline solid is:	stirred slowly	cooled very slowly	heated strongly	cooled rapidly	○○○●
116. Small ordered regions in amorphous solids are called:	crystallites	lattices	habits	cleavage planes	●○○○

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Questions	A	B	C	D	A B C D
117. Glass softens over a range of temperatures and can be moulded because it is:	a liquid crystal	an amorphous solid	a crystalline solid	a metal	○●○○
118. The internal angles of a crystal are:	different in each crystal	zero	always the same however it grows	variable	○○●○
119. Crystalline solids melt:	only under pressure	over a wide range of temperature	without any heat	sharply at a definite temperature	○○○●
120. Crystalline solids break along certain planes called:	growth planes	bond planes	cleavage planes	habit planes	○○●○
121. The shape in which a crystal usually grows is called its:	unit cell	lattice	cleavage	habit	○○○●
122. Cubic crystals of sodium chloride are obtained from:	molten salt only	its vapour	aqueous solution	solution containing 10% urea	○○●○
123. In the presence of 10% urea, sodium chloride crystallises in:	needle form	cubic form	spherical form	octahedral form	○○○●
124. Crystals form slowly when a saturated solution is:	boiled	heated	stirred vigorously	cooled	○○○●
125. Dipole–dipole forces are the forces of attraction between:	the positive end of one molecule and the negative end of another	two non-polar molecules	metal atoms	ions in a crystal	●○○○
126. The attractive forces between a dipole and an induced dipole are called:	hydrogen bonds	Debye forces	London forces	ionic bonds	○●○○
127. Instantaneous dipole–induced dipole forces are also called:	dipole–dipole forces	covalent forces	Debye forces	London forces	○○○●
128. Which type of force exists in all molecules, even non-polar?	Hydrogen bonds	London forces	Dipole–dipole forces	Ionic bonds	○●○○
129. Hydrogen bonding is a special case of:	London forces only	ionic bonds	covalent bonds	dipole–dipole forces	○○○●
130. Van der Waals forces are effective:	only at short distances	independent of distance	at both long and short distances equally	only at long distances	●○○○
131. Which of the following has the highest viscosity at room temperature?	Methanol	Glycerol	Water	Acetone	○●○○
132. A liquid is in a closed container at constant temperature. If its volume of container is increased, its vapour pressure:	becomes zero	decreases	increases	remains the same	○○○●
133. A patient in a hospital is given oxygen from a cylinder. This works because gases:	have fixed shapes	are incompressible	are highly compressible	have no pressure	○○●○

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Questions	A	B	C	D	A B C D
134. Two liquids, X and Y, have vapour pressures of 580 torr and 0.00016 torr at 20 °C. Liquid X has ___ intermolecular forces than Y.	equal	weaker	stronger	zero	○●○○
135. A liquid boils at a lower temperature on a mountain because the:	vapour pressure is lower	atmospheric pressure is higher	liquid is colder	atmospheric pressure is lower	○○○●
136. Evaporation of water from the skin cools the body because:	water takes up energy from the body	water gives off heat	sweat is colder than air	the skin loses water only	●○○○
137. Hydrogen bonding in water is responsible for all of the following properties EXCEPT:	high boiling point	low vapour pressure	high surface tension	low surface tension	○○○●
138. Water molecules in the liquid state are strongly attracted to each other through:	ionic bonding	metallic bonding	London forces only	hydrogen bonding	○○○●
139. Water boils at 120 °C when the external pressure is:	700 torr	1489 torr	23.7 torr	760 torr	○●○○
140. The boiling point of glycerine at 760 torr is about:	120 °C	210 °C	100 °C	290 °C	○○○●
141. By applying a vacuum of 50 torr, the boiling point of glycerine falls to about:	100 °C	290 °C	25 °C	210 °C	○○○●
142. In dynamic equilibrium between a liquid and its vapour, the number of molecules leaving the liquid surface is:	equal to the number returning	less than the number returning	greater than the number returning	zero	●○○○
143. The greater the intermolecular forces in a liquid, the ___ its boiling temperature.	lower	zero	higher	unchanged	○○●○
144. When the external pressure is high, a liquid boils at a ___ temperature.	zero	constant	higher	lower	○○●○
145. The kinetic energy of gas molecules depends upon:	nature of container only	temperature	shape of container	colour	○●○○
146. Compression and expansion of gases are used in the:	liquefaction of gases	melting of ice	distillation of water	crystallisation of salts	●○○○
147. Liquid crystals are used in chromatographic separation to study:	boiling points	atomic mass	molecular arrangements and kinetics	colour of salts	○○●○
148. Which of these substances is crystalline in nature?	Glass	Plastic	Glucose	Rubber	○○●○
149. A large number of collisions of gas molecules with the walls of a vessel produces:	crystal habit	viscosity	surface tension	pressure	○○○●
150. The boiling point of water at 23.7 torr is:	25 °C	98 °C	100 °C	69 °C	●○○○

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