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SSC-I NATIONAL BOOK FOUNDATION FBISE

CHEMISTRY TEST - CHAPTER 8: ENERGETICS

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 study of energy changes in chemical reactions is called chemical:	Equilibrium	Analysis	Energetics	Kinetics	○○●○
2. Every process in the universe involves a change in:	Name	Energy	Shape	Colour	○●○○
3. Some processes release energy and others:	Require energy	Destroy energy	Create matter	Stop	●○○○
4. In a chemical reaction, old bonds are broken and new bonds are:	Doubled	Formed	Destroyed	Ignored	○●○○
5. Breaking bonds always ——— energy.	Consumes	Releases	Creates	Destroys	●○○○
6. Forming bonds always ——— energy.	Destroys	Absorbs	Releases	Consumes	○○●○
7. If the energy released in bond formation exceeds the energy used in bond breaking, there is a net:	Release of energy	Loss of mass	Gain of mass	Absorption of energy	●○○○
8. If the energy used in bond breaking exceeds the energy released in bond forming, energy is:	Absorbed	Released	Created	Lost	●○○○
9. During chemical reactions, energy is exchanged with the:	Electrons only	Nucleus	Surroundings	Shells	○○●○
10. The part of the universe we focus on is called the:	Environment only	System	Universe	Surroundings	○●○○
11. The rest of the universe is called the:	Product	Surroundings (environment)	System	Reactant	○●○○
12. In the limestone and hydrochloric acid reaction, the system is:	Limestone and HCl solution	The air	The test tube	The room	●○○○

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Questions	A	B	C	D	A B C D
13. In the limestone and HCl reaction, the test tube is part of the:	Surroundings	System	Product	Reactant	●○○○
14. In thermal decomposition of a compound, the sample is the:	Heat source	System	Beaker	Surroundings	○●○○
15. Energy has many forms such as heat, light and:	Mass	Colour	Work	Charge	○○●○
16. A reaction accompanied by heat evolution or absorption is called a:	Photochemical reaction	Physical change	Nuclear reaction	Thermochemical reaction	○○○●
17. A balanced equation that also shows the heat change is a:	Ionic equation	Structural formula	Word equation	Thermochemical equation	○○○●
18. The branch dealing with heat changes in reactions is:	Biochemistry	Photochemistry	Thermochemistry	Electrochemistry	○○●○
19. There are _____ types of thermochemical reactions.	One	Three	Four	Two	○○○●
20. A reaction that proceeds with evolution of heat is:	Isothermal	Endothermic	Exothermic	Neutral	○○●○
21. A reaction that proceeds with absorption of heat is:	Neutral	Endothermic	Isothermal	Exothermic	○●○○
22. In an exothermic reaction, the system transfers energy to the:	Products only	Surroundings	Nucleus	Reactants	○●○○
23. In an endothermic reaction, heat is transferred from the surroundings to the:	Nucleus	Environment	System	Products only	○○●○
24. Burning of fuels is a highly _____ reaction.	Slow	Neutral	Exothermic	Endothermic	○○●○
25. The enthalpy change for C + O_2 → CO_2 is:	−393.5 kJ	+53.8 kJ	+393.5 kJ	−110.5 kJ	●○○○
26. The enthalpy change for $2H_2 + O_2 \rightarrow 2H_2O$ is:	+131.4 kJ	−393.5 kJ	+571.6 kJ	−571.6 kJ	○○○●
27. The enthalpy change for C + ½O_2 → CO is:	−110.5 kJ	+110.5 kJ	−393.5 kJ	+53.8 kJ	●○○○
28. The enthalpy change for $H_2 + I_2 \rightarrow 2HI$ (as in the book's endothermic example) is:	−53.8 kJ	+53.8 kJ	−571.6 kJ	−393.5 kJ	○●○○
29. The enthalpy change for C + H_2O → CO + H_2 is:	−393.5 kJ	−131.4 kJ	+53.8 kJ	+131.4 kJ	○○○●

Questions	A	B	C	D	A B C D
30. The enthalpy change for $N_2 + O_2 \rightarrow 2NO$ is:	−180.5 kJ	+180.5 kJ	−110.5 kJ	+53.8 kJ	○●○○
31. The amount of heat evolved or absorbed in a reaction is the enthalpy of:	Solution	Reaction	Vaporization	Fusion	○●○○
32. The sign of enthalpy change for exothermic reactions is:	Zero	Positive	Variable	Negative	○○○●
33. The sign of enthalpy change for endothermic reactions is:	Negative	Zero	Variable	Positive	○○○●
34. Standard enthalpy change is measured at _____ and one atmosphere.	25 °C (298 K)	100 °C	0 °C	50 °C	●○○○
35. The symbol for standard enthalpy change is:	ΔT°	ΔH°	ΔS°	ΔG°	○●○○
36. If ΔH is negative, the reaction is:	Neutral	Endothermic	Exothermic	Not possible	○○●○
37. The energy required to break one mole of a particular bond to form neutral atoms is the:	Bond dissociation energy	Ionization energy	Activation energy	Bond energy	●○○○
38. The energy released when neutral atoms form one mole of a bond is the:	Bond dissociation energy	Ionization energy	Activation energy	Bond energy	○○○●
39. ΔH° =	Σ reactants + Σ products	Σ bond dissociation energies of reactants − Σ bond energies of products	Σ bond energies of products only	Σ products − Σ reactants only	○●○○
40. Bond energy of H–H is:	436 kJ/mol	243 kJ/mol	151 kJ/mol	299 kJ/mol	●○○○
41. Bond energy of I–I is:	436 kJ/mol	151 kJ/mol	299 kJ/mol	243 kJ/mol	○●○○
42. Bond energy of H–I is:	243 kJ/mol	299 kJ/mol	436 kJ/mol	151 kJ/mol	○●○○
43. The enthalpy change for $H_2 + I_2 \rightarrow 2HI$ using the bond energies is:	+587 kJ	−598 kJ	+11 kJ	−11 kJ	○○○●
44. Bond energy of F–F is:	436 kJ/mol	567 kJ/mol	155 kJ/mol	243 kJ/mol	○○●○
45. Bond energy of H–F is:	436 kJ/mol	432 kJ/mol	567 kJ/mol	155 kJ/mol	○○●○
46. The enthalpy change for $H_2 + F_2 \rightarrow 2HF$ using bond energies is:	−543 kJ	−1134 kJ	+543 kJ	+591 kJ	●○○○

Questions	A	B	C	D	A B C D
47. Bond energy of Cl–Cl is:	155 kJ/mol	432 kJ/mol	436 kJ/mol	243 kJ/mol	○○○●
48. Bond energy of H–Cl is:	299 kJ/mol	243 kJ/mol	436 kJ/mol	432 kJ/mol	○○○●
49. The enthalpy change for $H_2 + Cl_2 \rightarrow 2HCl$ using bond energies is:	+679 kJ	+185 kJ	−864 kJ	−185 kJ	○○○●
50. Enthalpies from bond energy data are often _____ experimental values.	Always double	Always zero	Different from	Exactly equal to	○○●○
51. Collision theory was proposed to explain observed reaction:	Solubility	Colour	Equilibrium	Kinetics	○○○●
52. For a reaction to occur, particles must:	Freeze	Stay apart	Collide	Evaporate	○○●○
53. An effective collision needs enough energy and correct:	Colour	Orientation	Mass	Name	○●○○
54. The minimum energy needed for an effective collision is called:	Ionization energy	Lattice energy	Bond energy	Activation energy	○○○●
55. If the energy of colliding particles is lower than the activation energy:	Mass is lost	No reaction occurs	Energy is created	The reaction is fast	○●○○
56. The higher the activation energy, the _____ the reaction rate.	Zero	Lower	Constant	Higher	○●○○
57. A substance that speeds up a reaction without being changed is a:	Reactant	Product	Catalyst	Solvent	○○●○
58. The phenomenon of a catalyst speeding up a reaction is called:	Combustion	Catalysis	Hydrolysis	Electrolysis	○●○○
59. A catalyst increases the rate by _____ the activation energy.	Doubling	Raising	Removing	Lowering	○○○●
60. A catalyst _____ the enthalpy change of the reaction.	Does not change	Increases	Reverses	Decreases	●○○○
61. In living organisms, _____ catalyze chemical reactions.	Gases	Salts	Enzymes	Metals	○○●○
62. High temperature reactions cause _____ problems.	Smell	Safety	Colour	Taste	○●○○
63. A catalyst provides a new mechanism with _____ activation energy.	Higher	Infinite	Lower	Same	○○●○
64. Respiration is a _____ process in which energy is released from food.	Physical	Nuclear	Mechanical	Biochemical	○○○●

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Questions	A	B	C	D	A B C D
65. In respiration, _____ is oxidized.	Water	Oxygen	Carbon dioxide	Glucose	○○○●
66. Respiration is an _____ reaction.	Isothermal	Neutral	Endothermic	Exothermic	○○○●
67. Respiration that requires oxygen is:	Aerobic	Fermentation only	Anaerobic	Photosynthesis	●○○○
68. Aerobic respiration produces CO_2, water and:	Alcohol	Lactic acid	Starch	Energy	○○○●
69. Respiration without oxygen is:	Photosynthesis	Anaerobic	Aerobic	Combustion	○●○○
70. In anaerobic respiration, glucose is converted to:	Lactic acid and energy	CO_2 and water	Alcohol and CO_2 only	Starch	●○○○
71. Which respiration releases more energy?	Neither	Aerobic	Both equal	Anaerobic	○●○○
72. Which substance is NOT released in aerobic respiration?	Energy	Water	Lactic acid	Carbon dioxide	○○●○
73. Lipids serve as reserve _____ sources in the body.	Energy	Protein	Water	Oxygen	●○○○
74. During intense exercise when glucose is not enough, the body oxidizes:	Water	Minerals	Lipids	Vitamins	○○●○
75. Lipids store _____ amounts of energy in our body.	Very large	Equal	Very small	No	●○○○
76. All chemical reactions involve:	Catalysts	Energy changes	Colour changes	Enzymes	○●○○
77. A catalyst increases the rate of reaction by:	Changing enthalpy	Increasing activation energy	Lowering activation energy	Adding reactants	○○●○
78. The activation energy of a reaction must be _____ the energy of reacting molecules for a reaction to happen.	Unrelated to	Lower than or equal to	Double	Greater than	○●○○
79. Iron, steel, copper and aluminium are produced using energy from chemical:	Reactions	Tides	Colours	Seasons	●○○○
80. Energy changes in chemical reactions are mainly due to:	Volume only	Bond breaking and forming	Density	Colour changes	○●○○

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Questions	A	B	C	D	A B C D
81. An exothermic reaction pathway diagram shows products at _____ energy than reactants.	Equal	Lower	Infinite	Higher	○●○○
82. An endothermic reaction pathway diagram shows products at _____ energy than reactants.	Lower	Higher	Zero	Equal	○●○○
83. The energy difference between reactants and the peak of the pathway diagram is the:	Enthalpy change	Bond energy	Activation energy	Heat of combustion	○○●○
84. The energy difference between reactants and products on the diagram is the:	Enthalpy change	Activation energy	Heat of fusion	Bond energy	●○○○
85. A catalyzed pathway has _____ activation energy than the uncatalyzed one.	Higher	Lower	Equal	Infinite	○●○○
86. Bond breaking is an _____ process.	Neutral	Exothermic	Endothermic	Isothermal	○○●○
87. Bond making is an _____ process.	Isothermal	Exothermic	Neutral	Endothermic	○●○○
88. Which of these is an exothermic process?	Photosynthesis	Melting ice	Burning of fuel	Boiling water	○○●○
89. Which of these is an endothermic process?	Respiration	Rusting	Burning wood	Melting of ice	○○○●
90. Which of these is an endothermic reaction in the book?	$C + O_2 \rightarrow CO_2$	$2H_2 + O_2 \rightarrow 2H_2O$	$C + ½O_2 \rightarrow CO$	$N_2 + O_2 \rightarrow 2NO$	○○○●
91. Which of these is an exothermic reaction in the book?	$N_2 + O_2 \rightarrow 2NO$	$H_2 + I_2 \rightarrow 2HI$ (+53.8)	$C + H_2O \rightarrow CO + H_2$	$C + O_2 \rightarrow CO_2$	○○○●
92. The energy released in burning fuels can be used to heat a room, drive an engine or:	Make paper	Cook food	Make glass	Freeze water	○●○○
93. Thermochemical reaction means a reaction accompanied by evolution or absorption of:	Electricity	Sound	Heat	Light only	○○●○
94. In $\Delta H° = -393.5$ kJ, the negative sign shows the reaction is:	Endothermic	Impossible	Neutral	Exothermic	○○○●
95. In $\Delta H° = +180.5$ kJ, the positive sign shows the reaction is:	Impossible	Neutral	Endothermic	Exothermic	○○●○
96. The unit of enthalpy change used in the book is:	kJ	m	K	kg	●○○○

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Questions	A	B	C	D	A B C D
97. Enthalpy change in a reaction is the sum of energies absorbed and _____ in bond breaking and forming.	Released	Destroyed	Hidden	Created	●○○○
98. An effective collision must overcome the _____ between electrons of reacting particles.	Gravity	Magnetism	Attraction	Repulsion	○○○●
99. A reaction requires the correct _____ at the moment of collision.	Orientation	Mass	Colour	Density	●○○○
100. A catalyst remains chemically _____ at the end of the reaction.	Changed	Unchanged	Destroyed	Doubled	○●○○
101. The reaction rate depends on the _____ energy.	Nuclear	Activation	Kinetic only	Potential only	○●○○
102. The thermal decomposition of limestone would have the sample as the:	Product	Catalyst	System	Surroundings	○○●○
103. Which statement is true about exothermic reactions?	Energy is released to the surroundings	Energy is absorbed from the surroundings	Energy is created	No energy exchange occurs	●○○○
104. Which statement is true about endothermic reactions?	Energy is absorbed from the surroundings	Energy is destroyed	No energy exchange occurs	Energy is released to the surroundings	●○○○
105. The enthalpy change of respiration is:	Negative	Zero	Positive	Infinite	●○○○
106. Glucose + oxygen → CO_2 + water + energy is the equation of:	Photosynthesis	Fermentation	Anaerobic respiration	Aerobic respiration	○○○●
107. Glucose → lactic acid + energy is the equation of:	Aerobic respiration	Combustion	Anaerobic respiration	Photosynthesis	○○●○
108. Respiration is crucial for us because it provides:	Sound	Light	Energy	Colour	○○●○
109. A chemical system exchanging energy with its surroundings influences energy _____ during a reaction.	Transfer	Gain only	Storage only	Loss only	●○○○
110. Enthalpy is also called:	Electrical energy	Thermal energy (heat) change	Nuclear energy	Light energy	○●○○
111. The heat evolved in burning carbon to CO_2 is _____ per mole.	571.6 kJ	110.5 kJ	393.5 kJ	53.8 kJ	○○●○
112. Which has the largest heat evolved among the book's exothermic examples?	$C + ½O_2 \rightarrow CO$	$C + O_2 \rightarrow CO_2$	None	$2H_2 + O_2 \rightarrow 2H_2O$	○○○●
113. The higher the activation energy barrier, the _____ the reaction.	Slower	Constant	Faster	Explosive	●○○○

Questions	A	B	C	D	A B C D
114. Reaction between A_2 and B_2 molecules requires energy to start. This energy is the:	Activation energy	Heat of reaction	Enthalpy	Bond energy	●○○○
115. A reaction with very low activation energy proceeds:	Slowly	Only when cooled	Never	Quickly	○○○●
116. Which of these changes the pathway but not the enthalpy?	Heating only	A catalyst	Concentration	Pressure only	○●○○
117. In bodies of living organisms, enzymes act as:	Solvents	Catalysts	Products	Reactants	○●○○
118. What happens to the energy of a system during an exothermic reaction?	It decreases	It stays the same	It increases	It becomes zero	●○○○
119. What happens to the energy of a system during an endothermic reaction?	It decreases	It becomes zero	It stays the same	It increases	○○○●
120. Which part of a reaction releases energy: breaking or making bonds?	Making bonds	Neither	Both	Breaking bonds	●○○○
121. Which part of a reaction absorbs energy: breaking or making bonds?	Both	Making bonds	Neither	Breaking bonds	○○○●
122. The standard conditions for enthalpy of reaction are 25 °C and:	1 atm	0.1 atm	10 atm	100 atm	●○○○
123. 298 K is equal to:	0 °C	25 °C	100 °C	298 °C	○●○○
124. The oxidation of glucose in the body is:	Exothermic	Neutral	Isothermal	Endothermic	●○○○
125. When a fuel burns, chemical energy is converted mainly to:	Nuclear energy	Heat energy	Sound energy	Magnetic energy	○●○○
126. The energy of a reaction is plotted against:	Mass	Time of day	Colour	Reaction pathway	○○○●
127. The top of the hump in a reaction pathway diagram represents the:	Reactants	Products	Catalyst	Transition state (activation energy peak)	○○○●
128. Which is a source of energy for the human body?	Glass	Plastic	Metal	Glucose	○○○●
129. Which type of respiration is carried out by muscles during intense exercise when oxygen is short?	Aerobic	Photosynthesis	Anaerobic	Combustion	○○●○
130. Lactic acid is produced in:	Combustion	Photosynthesis	Aerobic respiration	Anaerobic respiration	○○○●

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Questions	A	B	C	D	A B C D
131. The branch of chemistry dealing with thermal energy changes is called:	Geochemistry	Astrochemistry	Thermochemistry	Biochemistry	○○●○
132. The equation $C + O_2 \rightarrow CO_2$ $\Delta H = -393.5$ kJ is called a:	Structural equation	Ionic equation	Thermochemical equation	Word equation	○○●○
133. Reactions that release heat feel:	Hot	Cold	Neutral	Wet	●○○○
134. Reactions that absorb heat feel:	Cold	Neutral	Dry	Hot	●○○○
135. The collision theory says that reacting particles must have energy equal to or greater than:	Enthalpy	Ionization energy	Activation energy	Bond energy	○○●○
136. A catalyst changes the rate of reaction but not the:	Speed	Activation energy	Enthalpy change	Pathway	○○●○
137. Enzymes are biological:	Acids	Catalysts	Reactants	Products	○●○○
138. ΔH for the reaction of 2 moles of H_2 with oxygen is larger than that of 1 mole because:	Colour changes	It is catalyzed	More substance reacts	Temperature differs	○○●○
139. If bond energies of reactants are higher than products, the reaction is:	Neutral	Exothermic	Endothermic	Impossible	○○●○
140. If bond energies of products are higher than reactants, the reaction is:	Exothermic	Neutral	Endothermic	Impossible	●○○○
141. The term 'thermo' means:	Light	Sound	Heat	Electricity	○○●○
142. The sum of energies absorbed and released gives the:	Enthalpy change	Activation energy	Mass defect	Bond length	●○○○
143. Heat energy of a reaction is measured in:	Kilojoules	Litres	Kelvin	Kilograms	●○○○
144. An example of energy used to produce raw materials is the production of:	Water	Light	Air	Steel	○○○●
145. Energy is used to transform raw materials into trains, trucks, cars and:	Oceans	Rivers	Clouds	Buildings	○○○●
146. The branch studying energy changes is called chemical energetics because it deals with:	Density	Atoms only	Colour	Energy	○○○●
147. In an exothermic reaction, the temperature of the surroundings generally:	Rises	Stays zero	Doubles	Falls	●○○○

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Questions	A	B	C	D	A B C D
148. In an endothermic reaction, the temperature of the surroundings generally:	Doubles	Stays zero	Falls	Rises	○○●○
149. Raising temperature increases the reaction rate because more particles have energy above the:	Bond energy	Mass	Charge	Activation energy	○○○●
150. Heat released or absorbed in a reaction is measured as a change in:	Density	Enthalpy	Mass	Volume	○●○○

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