Chemical Energetics

Sr	Questions	Answers Choice
1	The theory of chemical bonding has been a major problem of:	A. Modern Physics. B. Modern Chemistry. C. Modern Biology. D. Mechanics.
2	Which of the following statements is no correct regarding bonding molecular orbitals?	A. Bonding molecular orbitals possess ls energy than atomic orbitals from which they are formed. B. Bonding molecular orbitals have low electron density between the two nuclei. C. Every electron in bonding molecular orbitals contributes to the attraction b.w atoms. D. Bonding molecular orbitals are formed when the electron waves undergo constructive interference.
3	The covalent radius of Cl atom is:	A. 99.4 pm. B. 176.7 pm C. 38 pm D. 76 pm.
4	The amount of heat evolved or absorbed by keeping reactants and products at one atmospheric pressure at room temperature is called	A. Heat of formation B. Standard heat of formation C. Standard enthaply change D. None
5	Which of the following is not a state function	A. Pressure B. Temperature C. Enthalpy D. Amount of substance
6	For a given process, the heat change at constant pressure (p) and constant volume (v) are related to each other as	
7	Molecular orbitals are filled with the available electrons according to:	A. Hund's of rule. B. Pauli's exclusion principle. C. Aufbau principle. D. All of above.
8	Question Image	A. +712 KJ mol⁻¹ B. +492 KJ mol⁻¹ C. -932 KJ mol⁻¹ D. -960 KJ mol⁻¹
9	The amount of heat evolved or absorbed in a process in the same whether the process takes place in one or several steps is the statement of	A. First law of thermodynamics B. Hess's law C. Coulomb's law D. Phase law
10	According to the SI-system heat contents are measured in units of	A. Calorie B. Joules C. Ergs D. Watts
11	Question Image	A. -778.9 KJ B. 788.0 KJ C. -1.9 KJ D. +1.9 KJ
12	The heat energy change during a chemical reaction at constant pressure and at a given temperature is called	A. Change in internal energy B. Enthaply change C. Temperature change D. Work done by the system
13	Which of the following is a noble gas:	A. Ne. B. Cl₂. C. H₂. D. N₂.
14	The amount of heat required to convert one mole of solid directly into its vapour state at STP is called as	A. Molar heat of vaporization B. Standard heat of vaporization C. Heat of reaction

		D. Heat of neutralization
15	Question Image	A. Adding 2(ii) + 3(iii) and subtracting i B. Add i + ii + iii C. Add i - ii + iii D. Add i - ii - iii
16	Given data (i) heat of formation of $CO_2$is -393.7 KJ $mole^{-1}$ (ii) heat of formation of H_2O is -285.8 KH $mole^{-1}$ (iii) heat of combustion of CH_4 is -890.00 KJ $mole^{-1}$ Enthalpy of formation of methane from C and $H_2$is calculated by Hess's law by	A. Adding i + ii + iii B. Adding 2(i) and ii and subtracting iii C. adding i + iii and subtracting ii D. Adding i + 2(ii) and subtracting iii
17	ΔH is equal to	A. E + PV B. E + PΔV C. ΔE + P D. ΔE + PΔV
18	The heat of formation of graphite and P(white) is _____ KJ/mole	A. 0.00 B. -273.0 C. +8.7 D. 813.99
19	$N_2$and $O_2$are present in air but they don't react chemically at ordinary conditions of temperature and pressure because it is a	A. Spontaneous reaction B. Reversible reaction C. Exothermic reaction D. Non-spontaneous reaction
20	In endothermic reactions, the heat content of the	A. Products is more than that of reactants B. Reactants is more than that of products C. Both a and b D. None of the above
21	The bond length b/w atoms of hydrogen in the hydrogen molecules is:	A. 7.54 nm. B. 0.0754 nm. C. 0.754 nm. D. 0.00754 nm.
22	The number of bonds in nitrogen molecule is	A. Oneφ and one π<o:p></o:p> <o:p></o:p> B. Oneφ and two π<o:p></o:p> C. three sigma only D. Two φ and one π<o:p></o:p>
23	The tendency of atoms to attain a maximum of eight electrons in the valence shell is known as:	A. Duplet rule. B. Triad rule. C. Octet rule. D. Tetrade rule.
24	Which of the following molecules has zero dipole moment?	A. NH₃ B. CHCl₃ C. H₂O D. BF₃
25	A reaction in which heat is given out is	A. An endothermic reaction B. An exothermic reaction C. A thermochemical reaction D. An energetic reaction
26	Internal energy of a system is equal to	A. Kinetic energy of particles B. Potential energy due to binding forces between particles C. Sum of kinetic energy plus potential energy of the particles D. Heat contents
27	Glass calorimeter reaction is one which we measure	A. Enthalpy of combustion B. Enthalpy of reaction C. Pressure volume work D. None of above
28	Which of the following species has unpaired electrons in ant-bonding molecular orbitals?	A. O2⁺²<o:p></o:p> B. N2⁻²<o:p></o:p> C. <p

	Which of the following species has unpaired electrons in anti bonding molecular orbitals?	C. B₂ <o:p></o:p> D. F₂ <o:p></o:p>
29	By applying Hess's law, we can calculate	A. ΔH B. ΔS C. ΔF D. K
30	Which is not state function	A. Temperature B. Enthaply C. Entropy D. Internal energy
31	CsF is an ionic compound because:	A. High I.P of Cs and high E.A of F. B. High I.P of Cs and low E.A of F. C. Low I.P of Cs and high E.A of F. D. Low I.P of Cs and low E.A of F.
32	A system undergoes a change to attain the state of	A. High energy B. Low energy C. Moderate energy D. None of these
33	A macroscopic property of a system which describes the initial and final state of the system is called	A. Physical property B. Chemical property C. Energy property D. State function
34	When a bond breaks	A. Heat is evolved B. Heat is absorbs C. No change in heat contents takes place D. Temperature increases
35	which of the following has smaller size:	A. Fe+ ^{3<o:p></o:p>} B. Fe+ ^{2<o:p></o:p>} C. Fe+ ^{1<o:p></o:p>} D. Fe^{<o:p></o:p>}
36	The amount of heat evolved or absorbed in a chemical reaction, when the molar quantities of products and reactants being the same as represented in chemical equation. is called	A. Heat of reaction B. Free energy of reaction C. Entropy of reaction D. None of these
37	For a given process the heat change at constant pressure $q_p$is related to the heat change at constant volume (q_v) according to	A. q_p= q_v B. q_p< q_v C. q_p> q_v D. q_p= qv/2
38	When the degree of freedom increase the entropy _____	A. Decreases B. Increases C. Remains same D. All
39	One calorie is equal	A. 4.132 J B. 760 J C. 4.184 J D. 1 J
40	The forced which holds together two or more atoms or ions to form a large variety of compounds in called:	A. A chemical bond. B. An ionic bond. C. A covalent bond. D. A coordinate bond.
41	Which of the following elements is not stable:	A. Xe B. Ar. C. Kr. D. Li.
42	The amount of heat evolved or absorbed in a chemical reaction indicated by balanced chemical equation at 25° and one atmospheric pressure is called	A. Enthalpy of formation B. Enthalpy of neutralization C. Enthaply of combustion D. Enthaply of reaction
43	Which substances have $\Delta H = \Delta E$	A. Solids B. Liquids C. Gases D. Liquids and solids
44	One calorie is equal to	A. 5.184 J B. 3.184 J C. 4.184 J

		D. 7.184 J
45	The energy of the system and surrounding is conserved. This is a statement of	A. Law of mass action B. Law of definite proportion C. Law of conservation of energy D. Second law of thermodynamics
46	Lattice energy of NaCl	A. +5000 KJ B. -344 KJ C. -776 KJ D. -411 KJ
47	Question Image	A. -76 KJ B. -57 KJ C. -171 KJ D. -114 KJ
48	Which of the following is directly related with entropy	A. Pressure B. Degree of freedom C. Temperature D. Both b and c
49	The heat of formation of $SO_2(g)$ is -70.9 Kcal. The energy required for the decomposition of 1 mole of $SO_2(g)$ is	A. 35.50 Kcal B. 70.9 Kcal C. 141.8 Kcal D. -35.9 Kcal
50	Elements combine together due to inherent tendency to stabilize themselves by:	A. Losing electron. B. Sharing electrons. C. Gain in electrons. D. All of above.
51	The sun of all the energies of atoms, molecule, ion, within system is called	A. Enthalpy B. K.E. of the system C. Internal energy D. None
52	The standard enthalpy change in the formation of 1 mole of a compound from its elements in their standard physical states is	A. Enthalpy of formation B. Enthalpy of atomization C. Enthalpy of neutralization D. Internal energy change
53	Which of the following molecules has zero dipole moment>	A. H₂O B. CHCl₃ C. BF₃ D. NH₃
54	Question Image	A. -110.7 KJ/mole B. +110.7 KH mole⁻¹ C. 676.7 KJ mole⁻¹ D. +393.7 KH mole⁻¹
55	Heat,. work and internal energy of the system and surroundings are related into an equation which is called	A. First law of thermodynamics B. Hess's law C. Henry's law D. Born-haber cycle
56	The branch of chemistry which deals with thermal energy changes in chemical reactions is called	A. Chemical kinetic B. Thermodynamics C. Thermochemistry D. Mechanics
57	Born-Haber cycle is an application of	A. First of thermodynamics B. Second law of thermodynamics C. First law of thermodynamics D. Hess's law
58	The entropy of the universe	A. Constant B. Is equal to zero C. Decreasing D. Increasing
59	The decrease in radius in large for:	A. Monovalent ions. B. Trivalent ions. C. Divalent ions. D. Atoms.
60	For a given process, the heat changes at constant pressure (q_p) and at constant volume (q_v) are related to each other as	A. q_p= q_v B. q_p< q_v C. q_p< q_v D. q_p= qv/2
61	Statement enthalpy of combustion of $H_2$is -285.8 KJ mole^{-1}then which is the standard enthalpy of formation of water	A. +285.8 KH mole⁻¹ B. -285.5 KJ mole⁻¹ C. Zero D. -218 KJ mole⁻¹
		A. Both have equal sizes. B. Both have same properties

62	Which statement is true for Na and Na^+	B. Both have same properties. C. Size of Na is smaller than Na⁺ D. Size of Na is greater than Na⁺
63	Chemical reactivity of elements depends upon their characteristic:	A. Shape. B. Color. C. Electronic configuration. D. Sizes
64	Quantity of heat evolved or absorbed during the reaction is measured according to the equation	
65	Question Image	A. Hear of reaction B. Heat of formation C. Heat of neutralization D. Heat of combustion
66	In the chemical combination of hydrogen and fluorine to form HF:	A. Sodium atom donates major share of its electrons. B. Hydrogen atom donates the major share of its electrons. C. Both the atoms share the electrons equally. D. None of above.
67	An ionic compound A+B is most likely to be formed when	A. The ionization energy of A is high and electron affinity of B is low. B. The ionization energy of A is low and electron affinity of B is high. C. Both ionization energy of A and electron affinity of B are high. D. Both ionization energy of A and electron affinity of B are low.
68	The net heat change in chemical reaction is same whether it is brought in two or more different ways in one or several steps. it is known as	A. Henry's law B. Joule's principle C. Hess's law D. Law of conservation of energy
69	In a group of periodic table, atomic radii is:	A. Remains some. B. Increases. C. First decreases then increases. D. Decreases.
70	Energy can neither be created nor destroyed, although it can be transformed from one form to another. This is a statement of	A. Law of conservation of matter B. Law of definite proportions C. Law of conservation of energy D. None of these
71	The measurement of degree of disorder is	A. Internal energy B. Enthalpy C. Entropy D. None
72	In an exothermic reaction	A. Enthalpy of reactants is lesser than that of products B. Enthalpy of reactants is greater than that of products C. Heat is transferred form surrounding into the system D. Enthalpy of reactants and products same
73	Any substance under going physical or chemical change is said to be	A. Surrounding B. System C. Losphere D. Lithosphere
74	Enthalpy of neutralization of all the strong acids and strong bases has the same value because	A. Neutralization leads to the formation of salt and water B. Strong acids and bases are ionic substances C. Acid always give rise to H⁺ions and bases always furnish OH⁻ions D. The net chemical change involve the combination of H⁺and OH⁻ions to form water
75	Heat absorbed or released during the chemical reaction of physical process at constant pressure is equal to	
76	The increase in size of the anion is due to:	A. Increase in electron-electron repulsion B. Increase in valence shell electrons. C. Decrease in valence shell electrons. D. Both (a) and (b).

77	Termochemistry is the study of chemical reaction accompanying	A. Heat change B. Rate change C. Mass change D. Volume change
78	Question Image	A. The heat released is enthalpy of neutralization B. The heat released is enthalpy of atomization C. The heat released is enthalpy of sublimation D. The heat released is enthalpy of formation
79	ΔH for an endothermic reaction carries	A. Positive sign B. Negative sign C. Both sign D. None of these
80	The condition for standard enthalpy change is	A. 1 atm 30°C B. 1 atm 50°C C. 1 atm 25°C D. 760 atm 25°C
81	The radius of ion while considering it to be spherical in shape is called:	A. Covalent radii. B. Atomic radii. C. Ionic radii. D. Both (a) and (C).
82	Given date (i) heat of neutralization of HCl and NaOH is -57.3 KJ $mole^{-1}$ (ii) heat of neutralization of CH_3COOH with NaOH is 55.2 KJ $mole^{-1}$ The enthalpy of ionization of CH_3COOH is a determined according to Hess's law by	A. Adding i and ii B. Dividing i by ii C. Subtracting i from ii D. Subtracting ii from i
83	A state function of the system which describes together the internal energy and the work done is called	A. Enthaply B. Internal energy C. Work D. Free energy
84	Kinetic energy of the molecules is due to	A. Transnational motion B. Rotational motion C. Vibrational motion D. All of these
85	According to modern theory of chemical bonding atoms form bonds as it leads to a:	A. First decrease then increase in energy. B. Decrease in energy. C. No energy change. D. Increase in energy.
86	During a chemical reaction heat may be	A. absorbed B. Evolved C. Both evolved and absorbed D. None of these
87	Which of the hydrogen halides has the highest percentage of character?	A. HI B. HF C. HCl D. HBr
88	The heat contents of all the elements in their standard states are taken to be	A. 1 B. 2 C. 0 D. None
89	The change in heat energy at constant temperature is called	A. Enthalpy change B. Heat of vaporisation C. Bond energy D. Internal energy change
90	Spontaneous reaction is such in which the system decreases its _____	A. Energy B. Free energy C. Entropy D. All
91	A special application of the Hess's law to binary ionic compounds of M^+X^- type in calculation of their lattice energies is	A. Enthalpy of reaction B. Born-haber cycle C. First law of thermodynamics D. Enthalpy of combustion
92	Question Image	A. There is no change in temperature B. No change in volume C. Heat is absorbed D. Heat is released

93	Heat absorbed by a system when its volume does not change is equal to	A. Internal energy of system B. Enthalpy of system C. Increase in internal energy of system D. Increase in enthalpy of system
94	Any property which depends upon the T.P and V is said to be	A. Property due to k.E. B. Property due to PE C. Both a and b D. Thermodynamic state
95	The mathematical form of fist law of thermodynamics is	
96	Which property depends on the state of system	A. Enthaply B. Free energy C. Entropy D. All these
97	When two hydrogen atoms approach each other.	A. Forces of attraction operate. B. Forces of repulsion operate. C. Forces of attraction and repulsion operate simultaneously. D. Nothing happens.
98	If heat absorbed in the reaction, the process is said to be	A. Exothermic B. Isothermal C. Adiabatic D. Endothermic
99	Question Image	A. Positive sign B. Negative sign C. Without any sign D. None
100	One kilocalrie is equal to	A. 4.184 x 10³J B. 4.184 x 10⁴J C. 4.184 x 10²J D. None of these
101	Which of the following compound is no formed according to octet rule:	A. KrF_{2<o:p></o:p>} B. XeF₂<o:p></o:p> C. XeO₃<o:p></o:p> D. SF₆<o:p></o:p>
102	Which of the statement is contrary to the first law of thermodynamics	A. Energy can neither be created nor destroyed B. One form of energy can be transferred into an equivalent amount of other kinds of energy C. In an adiabatic process the work done is independent of its path D. Continuous production of mechanical work without supplying an equivalent amount of heat is possible
103	The energy required to break one mole of bonds to form neutral atoms is called	A. Bond length B. Bond strength C. Bond energy D. None of these
104	Heat of neutralization of weak acid and a strong base is	A. 13.7 Kcal B. Less than 13.7 Kcal C. Greater than 13.7 Kcal D. None of these
105	In the chemical combination of sodium and hydrogen to form NaH:	A. Hydrogen atom gains an electron. B. Sodium atom gains an electron. C. Both the atoms share the electron.
106	Molecular orbitals are filled with the available:	A. Hund's of rule. B. Pauli's exclusion principle. C. Aufbau principle. D. All of above.
107	In endothermic reaction, the heat content of the	A. Products is more than that of reactants B. Reactants is more than that of products C. Both a and b D. None of the above

108	Pressure volume work is	
109	As the nuclear charge increases, the pull on the electrons is increased and size of an atom:	A. Decreases. B. Remain same. C. Increases. D. Is negligible.