

GURUDAS COLLEGE
DEPARTMENT OF BIOCHEMISTRY
UG INTERMEDIATE EXAMINATION, 2020
B.SC BIOCHEMISTRY HONS. SEMESTER II

Core Course 3 General Physical Chemistry (Semester 2) BCM-A-CC-2-3-TH

TIME 30 mins

FULL MARKS

10+25

Choose correct answer:

1. The enthalpy of combustion of normal butane(C_4H_{10}) is
(A) -2877KJ (B) 2877KJ (C) -2044KJ (D) 1820KJ

Data given:

Heat of formation of $CO_2 = -393.5KJ$

Heat of formation of liquid water = -285.8KJ

Heat of formation of $C_4H_{10} = -126KJ$

2. The efficiency of a heat engine is maximum when
(A) Temperature of source is greater than that of sink.
(B) Temperature of sink is greater than that of source.
(C) Temperature difference of source and sink is minimum.
(D) Temperature difference of source and sink is maximum.
3. Which of the following expression is true for ideal gas?
(A) $(\frac{\partial v}{\partial T})_P = 0$ (B) $(\frac{\partial P}{\partial T})_V = 0$ (C) $(\frac{\partial E}{\partial V})_T = 0$ (D) $(\frac{\partial E}{\partial T})_V = 0$
4. Entropy of system depends upon
(A) Volume only (B) Temperature only (C) Pressure only (D) Pressure, volume & temperature.
5. n mole of a non volatile solute are dissolved in w gm of water. If K_f is the molal depression constant of water, the freezing point of the solution will be
(A) $\frac{1000Kfn}{w}$ (B) $-\frac{1000Kfn}{w}$ (C) $\frac{1000KfW}{n}$ (D) $-\frac{1000KfW}{n}$
6. A solution containing 5gm of an organic solute per 25gm of CCl_4 boils at $81.5^{\circ}C$ at 1atm pressure. If the normal boiling point of CCl_4 is $76.8^{\circ}C$, then molecular weight of the solute(given $K_b=5$) is
(A) 212.76 gm (B) 200gm (C) 225.56gm (D) 180.76gm
7. The yield of NH_3 in the reaction
 $N_2 + 3H_2 \leftrightarrow 2NH_3$; $\Delta H = - 22.08Kcal$ is affected by
(A) Change in pressure and temperature
(B) Change in temperature and concentration of N_2
(C) Change in pressure and concentration of N_2

- (D) Change in pressure, temperature and concentration of N_2
8. A solution composed of 10gm of a non-volatile solute in 100gm diethyl ether has vapour pressure 426mm at $20^\circ C$. If the vapour pressure of pure ether is 442.2mm at the same temperature. What is the molecular weight of the solute?
 (A) 194.592gm (B) 180.26gm (C) 294.592gm (D) 150.52gm
9. For a gaseous reaction

$$x\text{A} + y\text{B} \leftrightarrow l\text{C} + m\text{D}$$
 (A) $K_P = K_C$ (B) $K_P = (K_C)^{l+m}$ (C) $K_P = K_C (RT)^{(l+m)-(x+y)}$ (D) $K_P = 1/K_C$
10. "Whenever a stress is applied to a system at equilibrium, the equilibrium shifts in such a way so as to undo the effect of the stress imposed" This is the statement of
 (A) Rate law (B) Law of mass action (C) Le-Chatelier principle (D) Dilution law
11. At the critical temperature, the surface tension of the liquid is
 a. zero
 b. infinity
 c. same as that at the other temperature
 d. Cannot be determined
12. If the surface of a liquid is plane, then the angle of contact of the liquid with the walls of the container is
 a. Acute angle
 b. Obtuse angle
 c. 90°
 d. 0°
13. The surface of the water in contact with the glass wall is
 a. Plane
 b. Concave
 c. Convex
 d. Both a and b
14. Raindrops are spherical in shape because of
 a. Capillary
 b. Surface Tension
 c. Downward motion
 d. Acceleration due to gravity
15. According to the Debye-Huckel limiting law which aq solution of which electrolyte shows maximum non-ideality
 a. NaCl
 b. $AlCl_3$
 c. $Al_2(SO_4)_3$
 d. $BaCl_2$
16. For Debye-Huckel limiting law A value increases if
 a. Temperature and dielectric const value both are decreased
 b. Temperature and dielectric const value both are increased
 c. Concentration are increased
 d. Temperature is increased but dielectric const value is decreased
17. The equilibrium const K_P and K_C varies
 a. Temperature only
 b. Pressure only
 c. Both Temperature and pressure

d. none of above

18. For the following $\text{H}_2(\text{g}) + \text{I}_2(\text{g}) \rightleftharpoons 2\text{HI}(\text{g})$ reaction with increasing the pressure

- a. the equilibrium is shifted towards forward direction
- b. the equilibrium is shifted towards backward direction
- c. the equilibrium is unchanged
- d. none of above