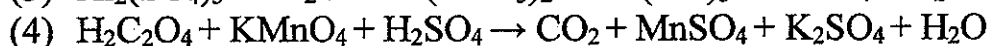
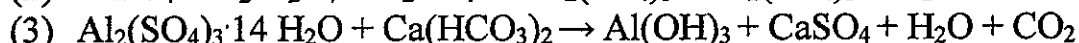


※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. Balance the following equations: (20%, 5% for each)



2. Please explain the following terms (4% for each, 20%)

(a) Avogadro constant ;

(b) common ion effect ;

(c) Ethalpy and Entropy ;

(d) Buffers and Buffer Index

(e)  $K_{oc}$  and  $K_{ow}$

3. Please use reactive formula to explain the photochemical mechanism that  $\text{NO}_x$  and acetaldehyde convert to ozone? (10%)

4. Please define the acid rain? (6%) and explain how the sulfur dioxide and nitrogen oxides were main resources of acid rain. (6%) Then, try to explore the effects of acid rain to ecosystem. (8%)

5. Please explain the environmental meanings of measurement of nitrogen compounds in the tap water, wastewater, and natural waterbody (8%). Please define the analytical method of ammonia nitrogen, organic nitrogen, nitrite nitrogen, nitrate nitrogen respectively (12%).

6. Please use  $\text{NH}_3$  as example and draw a figure to explain when  $\text{NH}_3$  emitted to a lake, the variation of water concentration of  $\text{NH}_3$ 、 $\text{NO}_2^-$ 、 $\text{NO}_3^-$  in the lake under aerobic environment (10%).