OLABISI ONABANJO UNIVERSITY
DEPARTMENT OF BIOCHEMISTRY
REMO CAMPUS, IKENNE

2006/2007 RAIN SEMESTER EXAMINATION

COURSE CODE: BCH 308 COURSE TITLE:BIOENERGETICS

TIME ALLOWED: 1HOUR DATE: 13TH MARCH, 2008

INSTRUCTION: ANSWER ONE QUESTION EACH FROM EACH SECTION

SECTION A

1. An amino acid binding protein (presumably involved in membrane transport) was isolated from E.Coli. Equilibrium dialysis measured at 28 and 40°C yielded Ks value of 8.5×10^{-5} and 2.5×10^{-3} M, respectively (ks is the dissociation constant of the protein substrate complex).
   Calculate (a) ΔG^0 for the binding reaction at 28 and 40^0C
   (b) ΔH for the binding reaction and (c) ΔS for the binding reaction at 28^0C (d) ΔG at 28 and 40^0C.

2. Calculate the ΔG^0 of hydrolyse of PEP to Pi and pyruvate given the following information

   (i) PEP + ADP $\rightleftharpoons$ Pyruvate + ATP
   $K^0eq = 3.2 \times 10^3$ cal/

   (ii) ATP + H_2O $\rightleftharpoons$ ADP + Pi
   $\Delta G^0 = -7700$ cal/mole

SECTION B

3(a) Write a short note on ATP-Synthase of the mitochondria.
(b) What is the yield of ATP from the complete oxidation of 3-phosphoglycerate.

4(a) What are the differences between F_1-F_O-complex and complex III of the mitochondrial respiratory chain?
(b) What is the relationship between Ubiquinone Cytochrome C Oxidoreductase and Cytochrome C_1?
(c) What is the yield of ATP from the complete Oxidation of Decanoic acid (C_{10})?