



**YILDIZ TECHNICAL UNIVERSITY
FACULTY OF ELECTRICAL AND ELECTRONICS
ENGINEERING
DEPARTMENT OF BIOMEDICAL ENGINEERING**



**BME 3711 – BIOTHERMODYNAMICS
2020 – FALL**

FINAL

1. Answer the following questions about thermodynamics of equilibrium.
 - A) Why do chemical reactions come to equilibrium? Sketch a graph to support your answer. (10 points)
 - B) How do the enzymes affect the equilibrium or ΔG of the reaction? (10 points)
 - C) Why are we interested in equilibrium conditions given the fact that life is never in equilibrium? (10 points)
2. Describe coupling of reactions in bioenergetics and discuss the role of ATP and the enzymes in this process. (15 points)
3. Discuss the thermodynamics of ion transport in thermodynamics perspective. (20 points)
4. Discuss the oxidative phosphorylation in thermodynamics perspective. (20 points)
5. Discuss cooperativity in thermodynamics perspective. (15 points)

GOOD LUCK

