1109457

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2014/2015 Harmattan Semester B.Sc. (Hons) Biochemistry Degree Examination

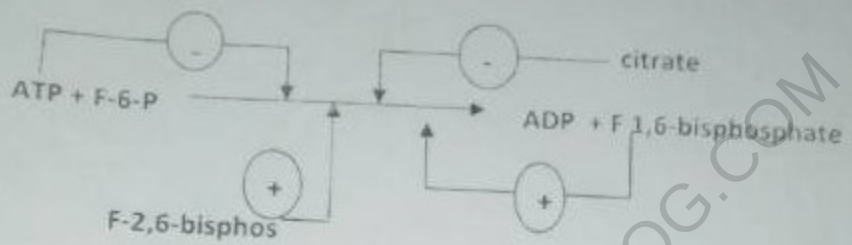
BCH 405: Metabolic Regulations

Instruction: Answer question ONE and any other Two questions Time allowed: 3hrs

1(a) All biochemical pathways are delicately regulated to maintain the ordered state. What are the the major strategies by which this regulation is accomplished.

(b) Define the following terms as they relate to enzyme catalysed biochemical pathways: (i) feedback inhibition (ii) sigmoidal kinetics (iii) allosteric site (iv) homotropic effector (v) heterotrophic effector (vi) zymogen

(c) The scheme below is showing the reaction catalysed by phosphofructose kinase I in glycolysis



Using the following terms (negative homotropic effector, negative heterotrophic effector, positive heterotrophic effector , negative feedforward control , positive feedback control) (i) select which terms appropriately describes the role of citrate, ATP, ADP on the enzyme, PFK I

(d) Name any three proteins that are subject to control by mechanism of of zymogen activation

2 (a) What do you understand by the term negative cooperativity

(b) Give the major postulations of the sequential and the concerted models of allosteric behaviour of enzymes

(c) Which of these models best describe the behaviour of aspartate transcarbamoylase (ATCase). Discuss

3. (a) Glycogen phosphorylase is controlled allosterically and by covalent modification. Show how this regulation is achieved in (a) liver cell (b) muscle of a mammalian specie.

(b) Discuss the effects on glycogen phosphorylase activity that may arise as a consequence of drinking lots of caffeinated coffee.

4. (a) Using a named biochemical pathway of your choice, give the name of the enzyme , substrate and products of the committed step/ rate limiting step of the named pathway.

(b) Describe using a sketch the regulatory mechanisms associated with the enzyme

(c) Show how chymotrypsinogen is activated to α-chymotrypsin.