



**QUIZ TIME**

# **Bio- chemistry**

**Lec 18**

It is the storage form of carbohydrate in animals, mainly found in the liver (8–10% of its weight) and muscle (2% of its weight). What is it?

- a) Cellulose
- b) Starch
- c) Glycogen
- d) Glucose

Ans:c

Which of the following correctly describes the structure of glycogen?

- a) Linear polymer of glucose linked only by  $\beta$ -1,4 bonds
- b) Branched polymer of glucose with  $\alpha$ -1,4 bonds in the chains and  $\alpha$ -1,6 bonds at branch points
- c) Homopolymer of fructose with  $\alpha$ -1,2 linkages
- d) Random polymer of glucose and galactose

Ans:b

In the initiation of glycogen synthesis, which of the following statements is correct?

- a) Glycogenin contains a serine residue that serves as the primer
- b) UDP-glucose is first attached to the tyrosine OH group of glycogenin
- c) Glycogen initiator synthase attaches glucose to lysine residue of glycogenin
- d) Initiation does not require a protein primer

Ans:b

Which of the following best describes the action of the glycogen branching enzyme?

- a) It elongates glycogen chains by adding glucose residues with  $\alpha$ -1,4 linkages
- b) It removes glucose units one by one from the non-reducing end
- c) It transfers a block of  $\sim 7$  glucose residues to a nearby chain and creates an  $\alpha$ -1,6 linkage
- d) It converts glucose to UDP-glucose before polymerization

Ans:c

Which of the following correctly describes the role of the debranching enzyme in glycogenolysis?

- a) Breaks  $\alpha$ -1,4 bonds and directly releases free glucose-6-phosphate
- b) Has both glucosidase and glucotransferase activity to remove glycogen branches
- c) Synthesizes UDP-glucose from glucose-1-phosphate
- d) Creates new  $\alpha$ -1,6 branches to increase glycogen solubility

Ans:b

Which of the following correctly differentiates glycogenolysis in the liver from that in the muscle?

- a) Liver lacks glucose-6-phosphatase, so glucose is used only for energy production
- b) Muscle converts glucose-6-phosphate to free glucose for release into the blood
- c) Liver converts glucose-6-phosphate to free glucose via glucose-6-phosphatase and releases it into the blood, while muscle uses glucose-6-phosphate directly in glycolysis
- d) Both liver and muscle release free glucose into the blood after glycogenolysis

Ans:C

Von Gierke's disease (Type I glycogen storage disease) is caused by deficiency of which enzyme, and what is a key clinical feature?

- a) Muscle phosphorylase deficiency → muscle cramps during exercise
- b) Glucose-6-phosphatase deficiency → severe fasting hypoglycemia
- c) Debranching enzyme deficiency → accumulation of limit dextrin
- d) Branching enzyme deficiency → abnormal glycogen with few branches

Ans:b

Which one of the following processes is stimulated by insulin?

- a) Hepatic glycogenolysis
- b) Muscle glycogenolysis
- c) Hepatic glycogenesis
- d) Lipolysis
- e) Gluconeogenesis

Ans:c

For glycogenesis, glucose should be converted to:

Options:

- a) Glucuronic acid
- b) Pyruvic acid
- c) UDP-glucose
- d) Sorbitol
- e) Lactic acid

Ans:c