



KN-5883

Seat No. _____

B. Sc. (Sem. III) Examination

November / December - 2014

Biotechnology : CC - I - 1

(301 : Cellular Metabolism - I)

Time : 3 Hours]

[Total Marks : 70

1 MCQ :

10

- (1) A synthetase can be classified as a(an) _____ because its function is joining two molecules together.
- (A) isomerase
 - (B) oxidoreductase
 - (C) hydrolase
 - (D) ligase
- (2) An enzyme that catalyzes the conversion of a cis double bond to a trans double bond is classified as a(an)
- (A) hydrolase.
 - (B) transferase.
 - (C) ligase.
 - (D) isomerase.
- (3) A multi-step biochemical process in which the rate of an early step is affected by the concentration of products of a later step is said to be subject to
- (A) Feedback control.
 - (B) Hydrolysis.
 - (C) Decomposition.
 - (D) pH control.

- (4) The mechanism of enzyme control that is similar to noncompetitive inhibition because both involve interactions with the enzyme at locations other than the active site is
- (A) zymogen production.
 - (B) feedback inhibition.
 - (C) allosteric interaction.
 - (D) zymogen activation.
- (5) In the pentose phosphate pathway, the major products are which of the followings ?
- (A) Ribulose and ATP
 - (B) Ribulose and NADPH
 - (C) Ribose and NADH
 - (D) Ribose and NAD⁺
- (6) The main function of the pentose phosphate pathway is to:
- (A) give the cell an alternative pathway should glycolysis fail
 - (B) provide a mechanism for the utilization of the carbon skeletons of excess amino acids
 - (C) supply NADH
 - (D) supply Pentoses and NADPH
- (7) The conversion of 1 mol of pyruvate to 3 mol of CO₂ via pyruvate dehydrogenase and the citric acid cycle yields ____ mol of NADH, ____ mol of FADH₂, and ____ mol of ATP (or GTP).
- (A) 3; 2; 0
 - (B) 4; 2; 1
 - (C) 4; 1; 1
 - (D) 3; 1; 1
- (8) Noncompetitive inhibition can be overcome by
- (A) increasing the concentration of substrate.
 - (B) decreasing the concentration of inhibitor.
 - (C) decreasing the concentration of products.
 - (D) decreasing the concentration of substrate.
 - (E) increasing the concentration of enzyme.

- (9) Intermediates of the citric acid cycle are replenished by a reaction converting pyruvate to
- (A) oxaloacetate
 - (B) citrate
 - (C) alpha-ketoglutarate
 - (D) succinyl-CoA
- (10) Which enzyme is used in gluconeogenesis but not glycolysis ?
- (A) Phosphoglucosomerase
 - (B) Lactate dehydrogenase
 - (C) Glucose 6-phosphatase
 - (D) 3-Phosphoglycerate kinase

2 Answers the following : (any five) 10

- (1) Define Enthalpy and Entropy
- (2) Write a Full name NAD and FAD
- (3) Define Enzyme and coenzyme
- (4) Explain Glucose to Ethanol production
- (5) What is the K_m and V_{max} value if competitive inhibition of enzyme?
- (6) Endogenic and Exergonic reaction

3 Answers the following : (any five) 30

- (1) Explain EMP pathway in the cell
- (2) Write a note on Enzyme Classification
- (3) Explain the Allosteric Regulation of Enzyme
- (4) What is thermodynamics? Explain second law of thermodynamics with biological important?
- (5) Write a note on competitive inhibition of enzyme and its Kinetics.
- (6) Explain Central Metabolic pathway

4 Answers the following : (any two)

20

- (1) Write a note TCA cycle with regulation
 - (2) Write a note on of HMP pathway
 - (3) Explain Aerobic oxidation of glucose
 - (4) Write a note on Enzyme inhibition.
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