

Q1 Which of the following enzymes of glucose metabolism participate in gluconeogenesis?

- A. PEP-CK
- B. Glucose phosphatase
- C. Hexokinase
- D. Pyruvate carboxylase
- E. Glucose-6-phosphate

- (A) a, b, c
- (B) b, c, d
- (C) a, b, d
- (D) c, d, e

Ans : (C) a, b, d.

Explanation:

Hexokinase is a glycolytic enzyme (irreversible step) and Glucose-6-phosphate is not an enzyme. Rest of the enzymes are Gluconeogenic.

Q2 . In the below table K_m and K_{cat} of four different enzymes is given. Which of the following has the highest catalytic efficiency?

| | K_m | K_{cat} |
|---|----------------|-----------|
| A | 0.4 micrograms | 250 |
| B | 200 nanograms | 250 |
| C | 2 micrograms | 200 |
| D | 4 micrograms | 200 |

Ans B.

Explanation:

Catalytic efficiency = K_{cat} / K_m

In option B nanograms has to be converted to micrograms. On calculation you get the answer.

Q3 In which of the following processes DNA methylation is not involved?

- A. Gene silencing
- B. RNA splicing
- C. Chromatin remodeling
- D. DNA Base excision repair

- (A) a and b
- (B) b and c
- (C) b and d
- (D) c and d

Ans C.

Explanation:

DNA methylation occurs in Gene silencing and Chromatin remodeling. In methyl directed mismatch repair DNA methylation is seen.

Q4 What is the sequence of events which takes place in PCR?

- (A) Hybridization → Denaturation → Annealing → Elongation
- (B) Denaturation → Hybridization → Annealing → Elongation
- (C) Hybridization → Annealing → Elongation → Denaturation
- (D) Denaturation → Annealing → Hybridization → Elongation

Ans D.

Explanation:

Denaturation is separating the 2 strands. Annealing is adding a primer to attach to the template for extension. Then elongation takes place where dNTPs bind to the complimentary nucleotide in the process of hybridization.

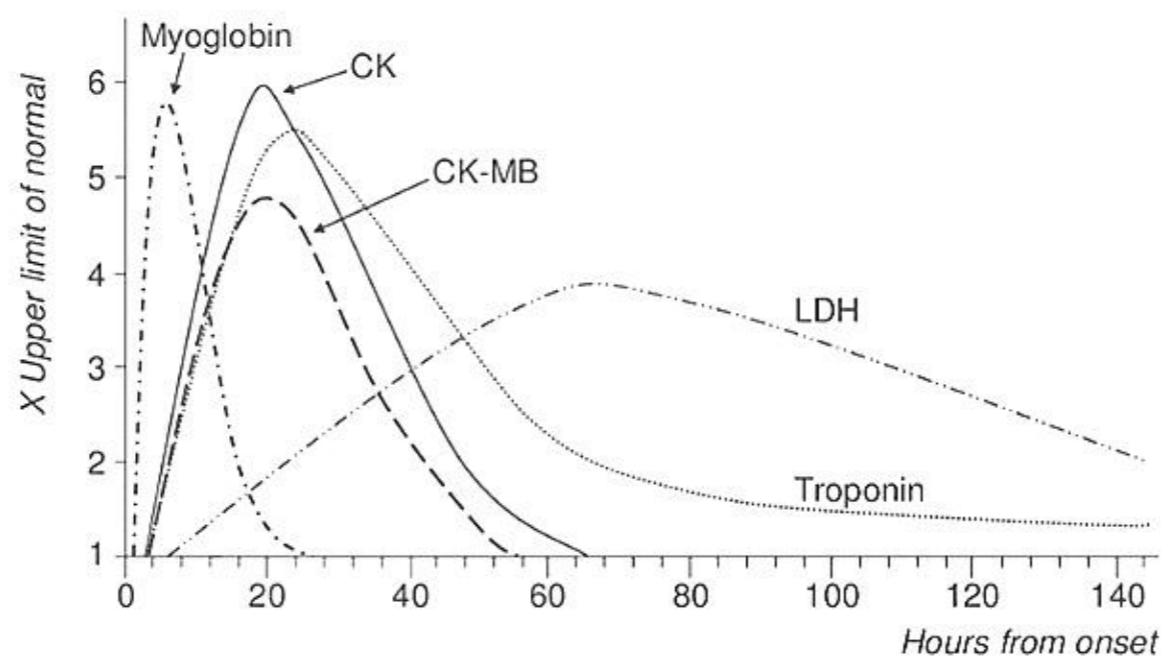
Q5 Which of the following is the most sensitive marker in first 2-4 hours of MI?

- (A) CK-MB
- (B) LDH
- (C) Trop-T
- (D) Pro-BNP

Ans C.

Explanation:

Sensitive here means rapidly released (to diagnose early cases) and detecting only true positive cases. CK-MB has 95% sensitivity.



Q6 Which of the following is a wrong statement about Telomerase?

- (A) Has reverse transcriptase activity
- (B) Found only in Eukaryotes
- (C) Maintain the length of chromosome
- (D) Active in somatic cells

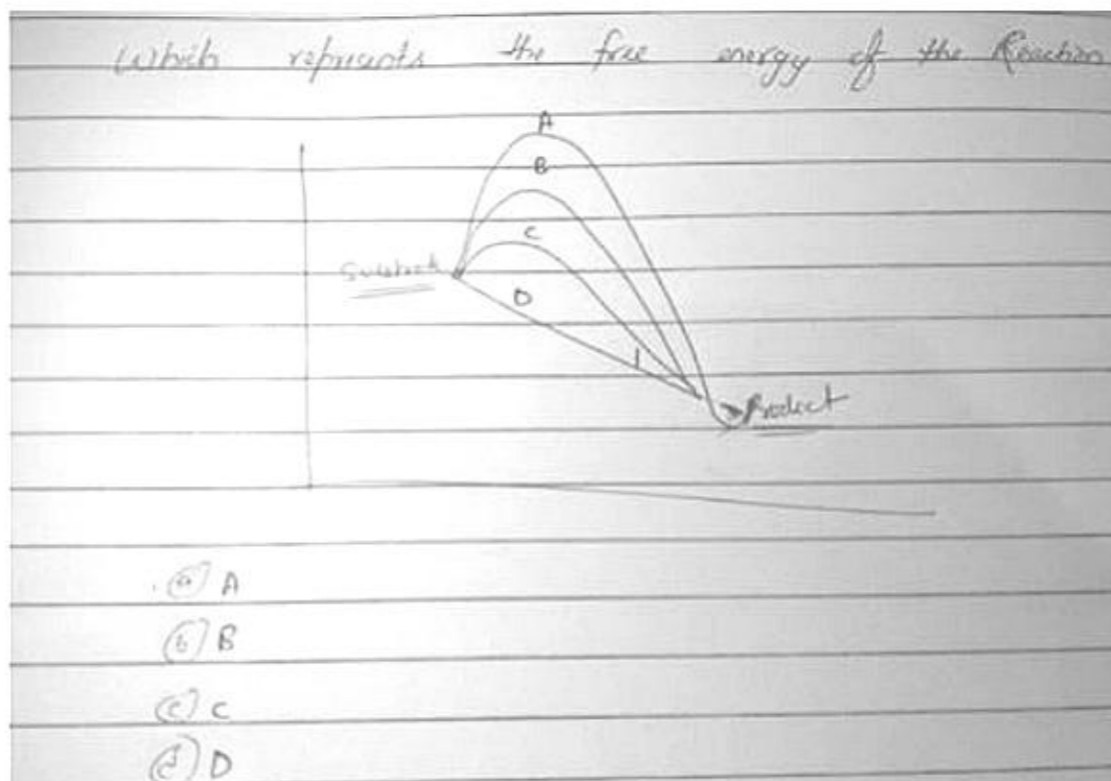
Ans D.

Explanation:

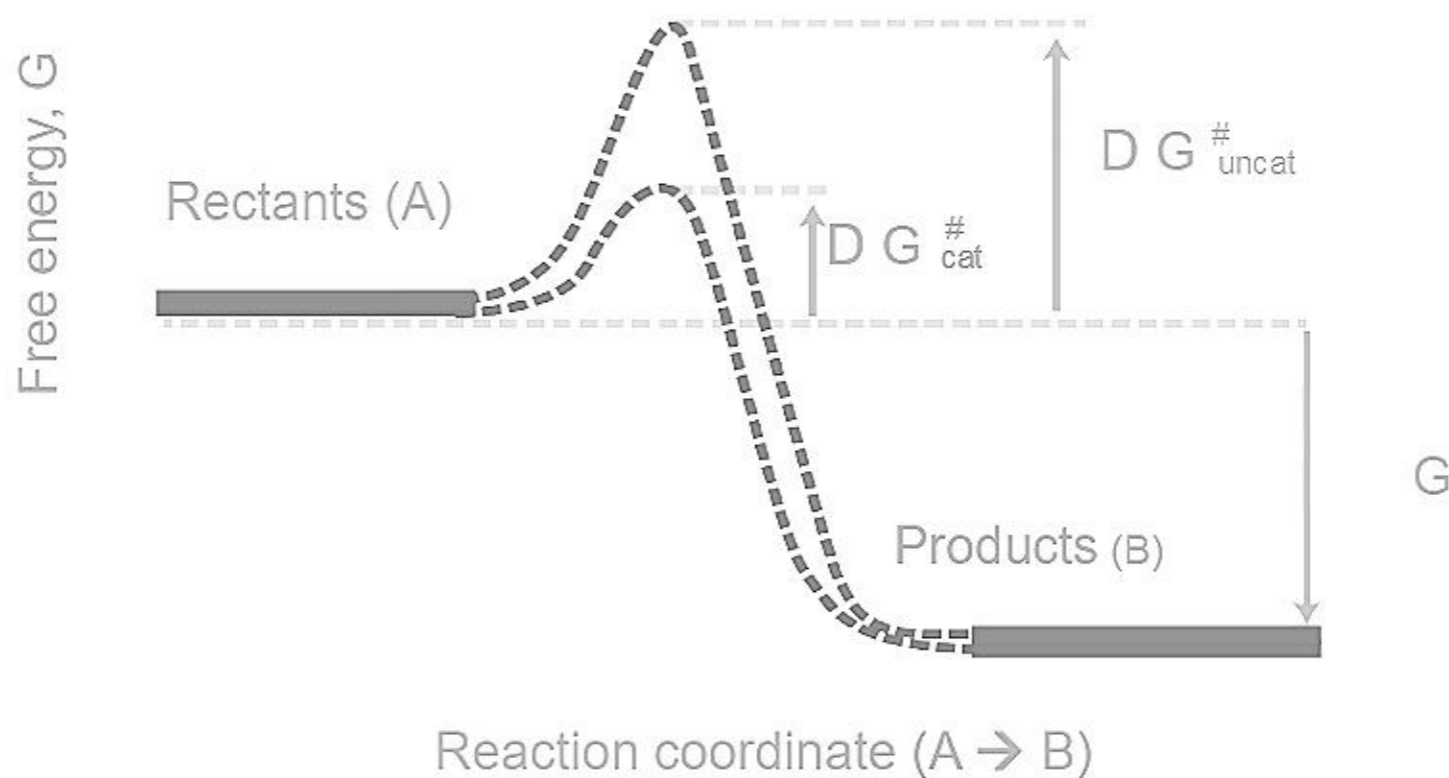
Telomerase is present in stem cells & most cancer cells and is absent in most somatic cells.

Q7 Which of the following depicts free energy change of an enzyme catalyzed reaction?

- (A) Upper curve
- (B) Lower curve
- (C) Both curves
- (D) Upper curve when it is reciprocal



Activation barrier (transition state, #)



Ans B.

Explanation:

The process of speeding up a reaction by reducing its activation energy is catalysis, and the factor that's added to lower the activation energy is called a catalyst (enzyme in case of biological catalysis).

Q8 Maximum Thermogenic effect is seen with which of the following meal?

- (A) Protein rich meal
- (B) Fat-rich meal
- (C) Mixed meal
- (D) Carbohydrate rich meal

Ans A.

Explanation:

Heat production by the body during digestion and absorption of food is called Thermogenic effect of food/ SDA (Specific dynamic action).

Protein -20-35%

Carbohydrate - 5-10%

Fats - 0 - 5%

Mixed food - 10%

Q9 Which of the following processes in T1DM with low insulin will contribute to ketogenesis & ketonuria

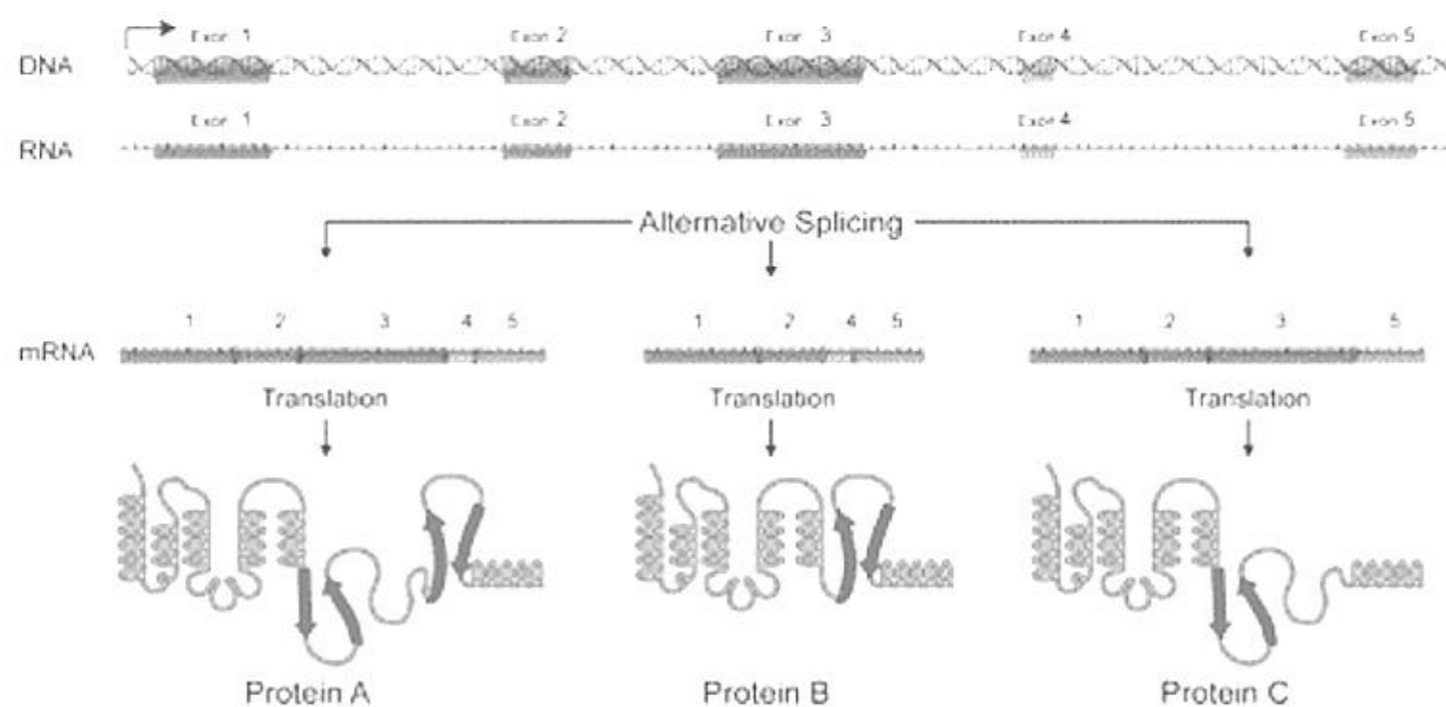
- A. Increased adipose tissue mobilization
 - B. Increased FA synthesis
 - C. Decreased shunting of acetyl coA to TCA cycle
 - D. Stimulation of beta-hydroxy butyrate synthase
- (A) a, b, c
 - (B) b, c, d
 - (C) c, d, a
 - (D) a, b, c, d

Ans C.

Explanation:

Ketogenesis occurs when acetyl CoA is in excess (Increased adipose tissue mobilization) and the TCA cycle is exhausted (Decreased shunting of acetyl coA to TCA cycle). Beta-hydroxy butyrate synthase stimulation will produce Beta-hydroxy butyrate which is a ketone body. When acetyl coA is directed for FA synthesis, ketogenesis will not occur.

Q10 Which type of alternative splicing is shown by protein B and protein C?



- (A) Exon skipping
- (B) Mutually exclusive exon
- (C) Intron retention
- (D) Both Exon skipping and Intron retention

Ans A.

Explanation:

Intron is not retained in the figure shown. Mutually exclusive exons are exons that cannot be on the same transcript.

Q11 Compare the Normality of 2mmol of HCl and 1mmol of H₂SO₄

- (A) 2 times
- (B) Half
- (C) 4 times
- (D) Same

Ans D.

Explanation:

$N = M$ multiplied by n

n is the number of equivalents

1M HCl is the same as 1N HCl, but 1M of sulphuric acids gives 2M of hydrogen ions into the solution. Therefore, normality of hydrogen ions will be 2N for a sulphuric acid solution.



