CSIR NET 2020 JUNE

335. Which one of the following options represents a series of amino acids with decreasing pK, values of their side chains?

(a) Arg, Lys, Cys and His

(b) Lys, Arg, Cys and His

(c) Lys, Arg, His and Cys

(d) Arg, Cys, Lys and His

336. Which one of the following proteins produces a dark blue/purple color in the presence of 5-bromo-4- chloro-3-indolyl and nitroblue tetrazolium?

(a) Polynucleotide kinase

(b) Alkaline phosphatase

(c) B-glucuronidase

(d) B-galactosidase

337. Which of the following metabolites formed during Calvin- one Benson cycle in chloroplast is involved in starch biosynthesis and can also be transported to cytosol ?

(a) Triose phosphate

(b) Glyceraldehyde phosphate

(c) Fructose 6. phosphate

(d) Ribulose 1.5-biphonphate

338 The rate constant for conversion of a substrate into the product is while the reverse rate constant is 10-4 s-1 An enzyme enhances the rate of this reaction by 100-fold. The equilibrium constant for this enzyme catalyzed reaction is

(a) 100

(b) 10000

(c) 10

(d) 1000

339. A stoichiometric mixture of α - and ß-anomers of D-glucose in water exhibits

(a) Net optical rotation proportional to the sum of the optical activities of each anomer

(b) No optical activity as the signs of optical rotation are opposite and they cancel each other

(c) No optical activity as the a and ß-anomers exist in the linear forms that are optically inactive

(d) No optical activity as they form a racemic mixture

340. Which one of the following is NOT produced by α- amylase digestion of ingested amylopectin?

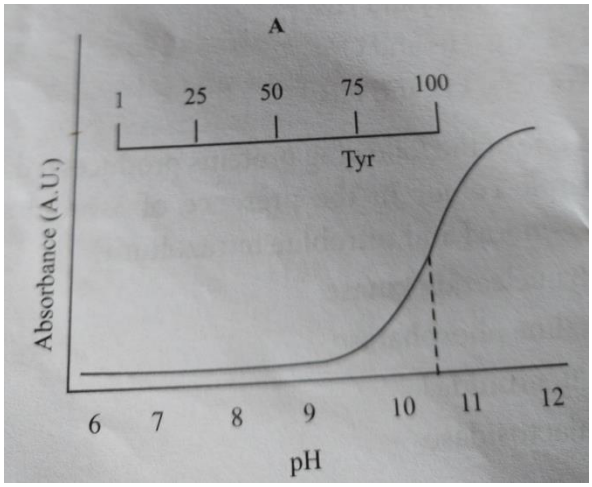
(a) Glucose

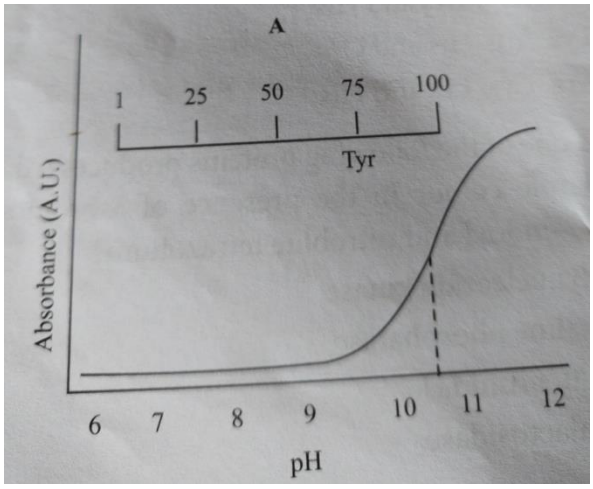
(b) Maltose

(c) Maltotriose

(d) a-limit dextrins

341. A 100 residue long protein has A single chromophoric residue (tyrosine). The UV absorption of this protein and a homologous protein (also with a single tyrosine residue) was monitored at 280 nm at different pH conditions. A plot of the absorbance as a function of pH is shown below The locations of the tyrosine residue in the context of the protein sequences is also shown in the figure.





Which one of the following rationalizes the difference in the two pH titrations?

(a) Removal of the hydroxyl group of tyrosine above pH 11

(b) Location of the tyrosine residue in the protein structure

(c) pH-dependent changes in the absorption in the polypeptide main chain

(d) Hydrolysis of the polypeptide as a function of pH

342. Insulin is a heterodimer made up of A and B peptide chains joined by the intra and interchain disulfide bridges formed between amino acid of respective chains as suggested below:

A. A_6 A_{11}

B. A_7 B_7

C. A_{20} B_{19}

D. A_5 B_{15}

Which one of the following represents the CORRECT disulfide bridges joining A and B chains of insulin hormone?

(a) A, B and D

(b) A, Cand D

(c) A, B and C

(d) B, C and D

343. The following disulfide bond containing peptide was digested using trypsin. How many peptide fragments will be produced by the digestion?

MTPQRAVILNSCTYRPYPM

I

NQGCLKVCVNPCGRLTDEH

(a) Three

(b) Four

(c) Five

(d) Six

344. The following statements were made to suggest the existence of enzyme-substrate complexes.

A. At constant concentration of enzyme, the reaction rate increases with increasing substrate concentration

B. An enzyme-catalyzed reaction has a maximal velocity.

C. At constant concentration of enzyme and substrate, an increase in the reaction rate is observed,

D. An enzyme-catalyzed reaction is not influenced by high substrate concentration.

Which of the above statements suggests the existence of enzyme-substrate complexes?

(a) A and B

(b) B and C

(c) A and D

(d) D only

345. The first step in the biosynthesis of valine begins with enzyme-catalyzed condensation of two molecules of pyruvic acid. If an equimolar mixture of $^{13}CH_3COCOOH$ are used as substrates for the reaction, which one of the following would represent the CORRECT isotope incorporation pattern of the pro-S diastereotopic methyl group in valine?

(a) 50% $^{13}CH_3$ (pro-R), $^{12}CH_3$ (pro-s)

50% $^{12}CH_3$ (pro-R), $^{13}CH_3$ (pro-s)

(b) 75% $^{13}CH_3$ (pro-R). $^{12}CH_3$ (pro-s)

25% $^{12}CH_3$ (pro-R), $^{13}CH_3$ (pro-s)

(c) 25% $^{13}CH_3$ (pro-R), $^{12}CH_3$ (pro-s)

25% $^{12}CH_3$ (pro-R), $^{13}CH_3$ (pro-s)

25% (pro-R), $^{13}CH_3$ (pro-s)

25% $^{12}CH_3$ (pro-R), $^{13}CH_3$ (pro-s)

(d) 75% $^{13}CH_3$ (pro-R), $^{13}CH_3$ (pro-s)

25% $^{13}CH_3$ (pro-R), $^{13}CH_3$ (pro-s)