KATHMANDU UNIVERSITY
End Semester Examination
August, 2018

Marks Scored:

Level : B. Tech.
Year : III
Course : BIOT 308
Semester: II
Exam Roll No. :
Time: 30 mins.
F. M. : 20
Registration No.:
Date AUG 15 2018

SECTION "A"
[16 Q. × 0.75 =12 marks]

Select the appropriate answer.

1. Electrophoresis belongs to ---------- based separation methods in enzyme separation.
   a. Size or mass
   b. Polarity
   c. changed insolubility
   d. Binding site

2. All amino acids have general formula NH_3-CHR-COO^-, except ----------
   a. Glycine
   b. Leucine
   c. Proline
   d. Methionine

3. Which of the following amino acid can't be recovered by acid hydrolysis----------?
   a. Tryptophan
   b. Glutamine
   c. Glycine
   d. Isoleucine

4. Which order of elution is not correct if elution of fragmented AA is carried out in increasing pH of 3.25, 4.25 and 5.28?
   a. Asp, thr, ser
   b. glu, pro, gly
   c. ala, val, met
   d. met, gly, thr

5. CH_3CH_2X in presence of KOH and alcohol produces ----------
   a. Alcohol
   b. Aldehyde
   c. Alkene
   d. Alkane

6. The activation of Zymogens takes place by the cleavage of bond from the C-terminal side of ----------
   a. Met and Ser
   b. Lys and Arg
   c. Tyr and Thr
   d. Lys and Tyr

7. Phosphorylase kinase is also activated by Ca^{2+} ions in the concentration range of ----------$\mu mol\ dm^{-3}$
   a. 0.1 to 1
   b. 0.5 to 1
   c. 1 to 1.5
   d. 0.1 to 1.5

8. Aspartate carbamomyltransferase that catalyzes the biosynthesis of pyrimidine in *E.coli*, is inhibited by----------
   a. ATP
   b. UMP
   c. UTP
   d. CTP

9. The kinetic behavior of a desensitized enzyme will show---------- plot.
   a. Hyperbolic
   b. Sigmoidal
   c. Straight
   d. None

10. 6-phosphofructokinase is inhibited, when the concentration of ---------- is high.
   a. AMP
   b. ADP
   c. ATP
   d.CMP

11. AMP activates phosphorylase "b" but the effect is counteracted by ----------
   a. ATP
   b. ADP & UDP-G
   c. G6P
   d. All of them

12. Cytochrome P450 in interaction with heme ligand ---------- the O_2.
a. Activates b. Polarizes c. Binds d. synthesize

13. The enzyme phosphorylase in glycogen pathway converts ----------
a. G-1-P to Glycogen
b. G-1-P to UDP-glucose
c. UDP-glucose to glycogen
d. glycogen to G-1-P

14. Which of the protein phosphatases groups do not belong to PPP gene family?
a. PP1 b. PP2A c. PP2B d. PP2C

15. Which of the enzymes is not assayed as supporting evidence for myocardial infarction released from necrotic tissue?
a. Creatine kinase
b. Aspartate aminotransferase
c. Phosphofructokinase
d. Lactate dehydrogenase

16. Which type of bond is unique in Tertiary structure of a protein?
a. Ionic bond b. Hydrogen bond c. Covalent bond d. Amide bond

SECTION "B"

[16 × 0.5 = 8 marks]

Fill in the blank.

17. EC numbering of a Transferase enzyme with transaldolase activity and occupying second position in sub-subclass and serial number in enzyme as 127 will be ----------?

18. ----------gland is the excellent source of enzymes such as acetly CoA carboxylase involved in fattly acid biosynthesis.

19. During hydrolysis of phenyl-β-D-glucopyranoside Acid catalysis yield a stabilized ---------- ----------which is then attacked by water to form glucose.

20. Chemical denaturants often act by increasing solubility of ---------- protein in water.

21. PPP gene family dephosphorylates ---------- residues in eukaryotic proteins.

22. Glycogen is a polysaccharide made up of D-glycopyranose units linked by ---------- bonds.

23. The presence of F26BP is the signal that the gluconeogenesis can be ----------

24. The 6-phosphofructokinase in *E.coli* shows sigmoid kinetics with respect to the substrate F6P but not ATP and is allosterically inhibited by ---------

25. High concentrations of NADH and /or acetyl CoA will ---------- pyruvate dehydrogenase.

26. Intrinsic control refers to the regulation of enzyme activity by the concentration of -------- ---------

27. Electrophoresis is a used to separate molecules based on their size and charge using an equation V= Ez / f, where f is frictional force in the molecule and is defined as **F**= -------?

28. In clinical words, alaline aminotransferase (ALT) in written as ----------

29. Insulin may stimulate the activation glycogen synthase, either by promoting its dephosporylation involving PP1 or by promoting the inactivation of----------.

30. Administration of adrenalin can cause the activation of ----------and an increase in the concentration of cAMP takes place.

31. The concentration of AMP in resting muscles is found to be approximately ----------dm^{-3}.

32. In glycogen synthase, nine different serine residues are phosphorylated *in vivo* by at least ----------different protein kinases.

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SECTION "C"

[6Q × 5 = 30 marks]

Attempt *ANY SIX* questions:

1. What is the rationale of enzyme measurement for diagnosis? For the measurement of an enzyme activity to be useful as a routine diagnostic clinical method, what conditions should be fulfilled? [1+4=5]

2. What are the major factors that determine the stability of an enzyme? Explain briefly about the role of each factor? [2+3=5]

3. State with example that competitive inhibition is a part reversible inhibition. How does the plot of Michaelis-Mentern changes in competitive inhibition? [2+3=5]

4. Outline the scheme for "Indirect" determination of amino acid sequence of a protein. What are the major problems encountered and their solutions in determining the amino acid sequences. [2+3=5]

5. Draw the interconvertible forms of phosphorylase in presence of ATP. What are the common features of ligand induced conformational changes in enzymes? [1+4=5]

6. How does the activity of hexokinase is regulated in glycolytic pathway? [5]

7. What are enantiomers and diastereomers? Explain the type of immobilization of enzyme for industrial purpose. [2+3=5]

8. What is the role of Creatine kinase and fructose bisphosphate aldolase in clinical aspects? [5]

SECTION "D"

Attempt *ANY FOUR* questions. (Q. No. 13 is compulsory)

9. Draw the clear mechanisms of Hydride ion transfer in epimerization and 4, 6-dehydratase reaction. [3 × 2=6]

10. Explain the control mechanism of carbamoyl phosphate synthesis of *E.coli* with proper drawing. [6]

11. What is meant by extrinsic and intrinsic control of metabolic pathways? What are the physiological advantages of this type of controls? [2+4=6]

12. Draw the diagram of substrate cycle occurs in the glycolytic pathway. How does the regulation of the activity of 6-phosphofructokinase happens in glycolytic pathway. [6]

13. Write explanatory short notes on: [2 × 3.5 = 7]
    a. Biosensor
    b. Galactosaemia