مركز تقارب الثقافي يقدم أسئلة الBiochemistry لمادة الFirst

1. *All of the following amino acids are aromatic except :*
   A. Phe
   B. Trp
   C. Tyr
   D. Ser
   E. All are aromatic

2. *One of the following amino acids is basic :*
   A. His
   B. Leu
   C. Pro
   D. Ala
   E. Ser

* In questions 3-7 choose the amino acid that's matched correctly with
   A. His B. Aspartic acid C. Glutamine D. Proline E. Threonine
   F. Glycine

3. *Has amide group in its side chain*
4. *Devoid an amino group*
5. *Has the smallest side chain*
6. *Proton donor*
7. *Has a role in myoglobin functioning*

8. *since the pK values of Asp are 2, 3.9, 10, PI is at pH of:*
   A.3
   B.3.2
   C. 5.9
   D. 6
   E. 7

9. *PH of the stomach is*
   A. 2 C. 7
   B. 5 D. 10 E. 14

10. At neutral pH a mixture of a.a in solution would be predominantly

A. dipolar ions
B. nonpolar molecules
C. hydrophobic
D. positive & monovalents
E. negative & monovalents

11. PH numerically equivalent to

A. log [H+]
B. - log [H+]
C. In [H]
D. –In [H]
E. 1/log [H+]

12. Heme is a complex of

A. protoporphyrin lX & Fe+3
B. protoporphyrin lX & His
C. protoporphyrin lX & Fe+2
D. prophobilinogen & Fe+2
E. protoporphyrin lX , His & Fe+2

13. One statement describe Hb:

A. Tertiary tetramer.
B. Has no allosteric factors.
C. compact structure.
D. Its heme binds O2 in ferric state.
E. C & D

14. One statement is false about 2-3 BPG

A. the most abundant organic phosphate in RBC
B. synthesized from glycolysis
C. decreases O2 affinity of Hb by binding to deoxy-Hb
D. Hb tetramer binds 4 molecules of 2-3 BPG
E. all are true

15. The isoelectric point of a protein is defined as:

A. the PH at which the net charge on the molecule is 0.

B. the PH at which all groups are protonated.
C. the PH at which all groups are unprotonated.
D. the PH at which each acidic group is protonated and each basic group is unprotonated

16. Which is true for the following proteins : collagen ,hemoglobin , Myoglobin , oxytocin .
A. they all have primary structure
B. they all have secondary structure
C. they all have tertiary structure
D. they all have quaternary structure

17. The Ramachandran diagram shows the sterically allowed values for the:
A. angles of the side chains of the alpha-helix and of beta-pleated sheet.
B. Psi and phi angles of the alpha carbon in a polypeptide.
C. angle between the C=O and the N-H of the peptide bond.
D. angle of the right-turn twist of the beta-pleated sheet.

18. Which of the following amino acids may participate in the formation of covalent crosslinks that stabilize the tertiary structure of many globular proteins?
A. methionine
B. cysteine
C. serine
D. leucine
E. histidine

19.Disulfide bonds in proteins are formed between:
A. methionine residues.
B. serine residues.
C. histidine residues.
D. cysteine residues.
E. proline residues.

20. The sickling of red blood cells in individuals with sickle cell anemia is caused by
A. formation of the hemoglobin R state.
B. aggregation of deoxyhemoglobin.
C. aggregation of oxyhemoglobin.
D. denaturation of hemoglobin.
E. oxidation of Fe+ + to Fe+ + +.

21. Enzymatic reaction occurs in a relatively small region of the enzyme called:
A. N-terminal

B. Isoenzyme
C. Allosteric site
D. Active site
E. C-terminal

22. Scurvy, defective collagen is due to insufficient vitamin C which:
A. is ordinarily incorporated into crosslinks between tropocollagen molecules.
B. is usually involved in the hydroxylation of prolyl residues.
C. inhibits the oxidative degradation of collagen .
D. is required for the conversion of lysyl residues into aldehydes.
E. conversion from tense to relaxed conformation at increased PCO2.

23. The term secondary structure of protein refers to as:
A. alpha helix & beta pleated sheets
B. overall conformations
C. subunit interactions
D. relationship of two polypeptide chains

24. Amino acid not stable in alpha helix is:
A. Proline.
B. Alanine.
C. Glutamine.
D. Tryptophan.

25. In a non –competitive enzymatic reaction:
A. Km decreases – Vmax shows no change
B. Km & Vmax increases
C. Km &V max decreases
D. Km shows no change & Vmax decreases

26. The active site of an enzyme:
A. never changes shape
B. forms no chemical bonds with substrates
C. determines, by its structure, the specificity of the enzyme
D. is only good once
E. changes the equilibrium constant of the reaction

27. A prosthetic group:
A. is a tightly bound nonprotein part of an enzyme.
B. is composed of polypeptides.
C. does not participate in chemical reaction.
D. is present in all enzymes.
E. is a nonprotein enzyme.

28. The rate of an enzyme –catalyzed reaction:
A. is constant with an increase in substrate concentration
B. decreases with an increase in substrate concentration
C. cannot be measured.
D. initially; it is a 1^{st} order reaction.
E. can't be reduced by inhibitors

29. Which statement is not true of enzyme inhibitors?
A. A competitive inhibitors binds the active site of the enzyme
B.Allosteric enzymes exhibit michaelis – menten kinetics
C.A noncompetitive enzyme binds elsewhere than the active site
D.Noncompetitive inhibitors can not be completely overcome by adding more substrate.
E .competative inhibitors can be completely overcome by adding more substrate.

30. Hydrophobic interactions:
A. are stronger than hydrogen bond.
B. are stronger than covalent bond.
C. can hold two ions together.
D. can hold two nonpolar molecules together.
E. are responsible for the surface tension of water

31. Which of the following statements about amino acids IN HUMAN is not true?
A. they are the monomers of proteins.
B. they contain carboxyl groups.
C. they ALMOST contain amino groups.
D. they do not ionize.
E. they have both L- and D-isomers.

32. Which statement about the amino acid cysteine is false?
A. it can form peptide bonds.
B. it can form disulfide bonds.

C. it is found in some proteins.
D. it can be important to quaternary structure.
E. it can be important to tertiary structure.

33. Which of the following types of bonds or interactions are LEAST likely to be involved in stabilizing the three-dimensional folding of most proteins?
A. Hydrogen bonds.
B. Electrostatic bonds.
C. Hydrophobic interactions.
D. Disulfide bonds.
E. Peptide bonds.

34. A water-soluble globular protein is most likely to have the highest proportion of which of the following amino acid residues buried within its core?
A. Serine.
B. Histidine.
C. Isoieucine .
D. Glutamate.
E. Lysine.

35. Amphipathic molecules may spontaneously assemble to form micelles or bilayers in water solution through the formation of:
A. hydrophobic and hydrophilic interactions.
B. covalent bonds.
C. interactions with membrane proteins.
D. ionic bonds.

36. Which structure is unique to collagen?
A. the alpha helix.
B. the double helix.
C. the triple helix.
D. the beta structure.
E. the beta barrel.

37. The secondary structure of a protein refers to:
A. repetitive regular structures including (α-helix and beta sheets).
B. the hydrophobic or hydrophilic nature of the protein.
C. local, regular conformations in space resulting from noncovalent interactions between AA side chains (R groups).
D. the formation of peptide bonds between adjacent AA residues

E. B & C.

38. Which substance would be a suitable buffer at pH 7.4?

A. one with a pKa of 3.8 .
B. one with a pKa of 4.8 .
C. one with a pKa of 6.3 .
D. one with a pKa of 7.7 .

39. Which of the following effects is NOT used during enzyme catalysis?

A. Binding of the correct stereoisomer of the substrates
B. Decreasing the overall free energy of the reaction
C. Lowering the activation energy of the reaction
D. interaction between substrate and active site
E. Binding substrate to the enzyme

40-When enzymes are heated above a certain temperature, what process they undergo?

A .disintegration.
B .denaturation.
C .petrification.
D .desiccation.

41-Which of the following statements is correct:

A .The a-helix can be composed of more than one polypeptide chain
B .B-sheets exist only in antiparallel form
C .B bends often contain proline.
D .motifs are types of secondary structure.
E .the a helix is stabilized primarily by ionic interactions b/w the R groups of the a.a.

42-Which of the following statements concerning the hemoglobin is correct:

A fetal blood has a higher affinity for oxygen then does adult blood coz HbF has a decreased affinity for 2,3 BPG
B .purified HbF (W/O BPG) has a higher affinity for O2 than does purified HbA.
C .the chain composition of HBF is 2 alpha helix and 2 delta.
D. HbA2 appears early in life

43. A competitive inhibitor of an enzyme

a . Increase Km w/o affecting the V max
b .decrease Km without affecting the Vmax
c . increase Vmax without affecting the K m

d . decrease Vmax w/o affecting the Km
e .decrease both of them

44 An enzyme that catalyses the following rxn A -------B changes the

a . Heat of the rxn
b .Rate of the reaction
c. equilibruim concentration of A
d . PH of the rxn
e. rate of both forward and backward rxn

45. THE optimal PH for pepsin?

a. 2
b. 3
c. 7
d. 6
e. neutral PH

46-Which of the following is an advantage of an enzyme over inorganic catalysis:

A .enzymes are more flexible, they can catalyze many different rxns
B .enzymes are more efficient, they can increase the rate of the rxn by a greater factor than inorganic catalysts
C .enzymes are more easily regulated and they are more easily turned on or off

47-Which statement is not true about the effects of various conditions on the activity of the enzyme:

A . Higher temperature generally increase the activity of the enzyme up to a point
B . above a certain range of temperature, the protein of an enzyme denatured
C .a change in PH can cause the enzyme to be inactivated
D . an enzyme activity is generally reduced by an increase in substrate concentration.
E .when sufficient substrate is available; the active site will nearly always be occupied

48. The active site of an enzyme

A .is similar to that of any other enzyme
B . is the part of the enzyme where the substrate can fit
C. can be used over and over again
D . Is not affected by environmental factors like PH and temperature
E .both B and C are correct

49 -an allosteric site of the enzyme:
a . the same as the active site
b .nonprotein in nature
c . where ATP is bound and gives up its energy
d .often involved in feed back inhibition
e. all are correct.

50. Which of the following is not true about the common alpha-helix
A. the structure is right handed
B. the distance along the helix axis is 5.4 a per turn.
C. there are an irregular number of amino acids per turn.
D. the amino acid R-groups are on the outside of the helix .
E. it is stabilized by hydrogen bonding.

51- THE Km of the enzyme is:
a-numerically equal to 1/5 Vmax
b-independent o PH
c-it is higher for aspartate transcarbamoylase than other enzymes
d-substrate concentration when half of highest rate of the reaction is reached

52. all of the following describes the active site of the enzyme except:
a- it is small relative to the entire enzyme
b- specificity is defined by the arrangement of certain atoms
c- it is similar between digestive enzymes
d-it is initially bind the substrate by weak interaction.

53-Which of the following amino acids are usually absent in the alpha helix:
a- glycine
b-alanine
c- leucine
d- proline

54. Which class of enzymes catalyzes the transfer of electrons from one component to another?
a- ligases
b-isomerases
c-lyases
d-hydrolases

e-oxidoreductase

55. All are characteristic of allosteric enzymes except:

a- They frequently catalyze a committed step early in metabolic pathway.
b-they often composed of subunits.
c-they often show cooperatively for substrate binding
d-its Km defined as substrate concentration when 1/5 of Vmax is reached
e-when binds to positive allosteric factor the activity is increased.

56. Which one is correct?

a-Protein consisting of one polypeptide can have quaternary structure
b-formation of disulfide bridge in protein requires that 2 cysteine to be adjacent to each other in the primary sequence.
c-denaturation of protein leads to irreversible loss of its structure.
d-the information required for correct folding is contained in specific sequence of amino acids a long polypeptide chain.

57. The net charge for VAL-ALA-GLY-VAL in neutral PH :

a. +1
b. - 1
c. 0
d. +2

58. The net charge for VAL-HIS-GLY-VAL in neutral PH:

a. +1 b. – 1 c. 0 d. +2

59. Interaction between CH3CH2CH2CH3 & CH4 is an example of:

a. dipole induced dipole
b. ionic dipole
c. van der waal
d. hydrophilic

60. Which one is correct?

a.micelles formation is an example of temporary dipole interaction
b. all non polar molecules contain non polar bonds only
c. covalent bonds need more energy to break it than non covalent bonds
d. fatty acids is an example of hydrophilic compounds

61. Regarding super secondary structure, which is incorrect?

A. B a B is N shaped
b. a a is parallel structure

c. B meander is multiple sheets
d. the most common one is B a B

62. Proline containing type 2 reverse turn:

a. the second a.a is glycine and the third is proline
b. the importance of proline is its cyclic structure
c. the importance of glycine is its titrable side chain
d. it binds primary protein with another one

Answers sheet

1		**19**		**37**		**55**	
2		**20**		**38**		**56**	
3		**21**		**39**		**57**	
4		**22**		**40**		**58**	
5		**23**		**41**		**59**	
6		**24**		**42**		**60**	
7		**25**		**43**		**61**	
8		**26**		**44**		**62**	
9		**27**		**45**			
10		**28**		**46**			
11		**29**		**47**			
12		**30**		**48**			
13		**31**		**49**			
14		**32**		**50**			
15		**33**		**51**			
16		**34**		**52**			
17		**35**		**53**			
18		**36**		**54**			

Answers sheet

1	D	19	D	37	A	55	D
2	A	20	B	38	D	56	D
3	C	21	D	39	B	57	C
4	D	22	B	40	B	58	C
5	F	23	A	41	C	59	C
6	B	24	A	42	A	60	C
7	A	25	D	43	A	61	B
8	A	26	C	44	B	62	B
9	A	27	A	45	B		
10	A	28	D	46	B		
11	B	29	B	47	D		
12	C	30	D	48	E		
13	C	31	E	49	D		
14	D	32	D	50	C		
15	A	33	E	51	D		
16	A	34	C	52	C		
17	B	35	A	53	D		
18	B	36	C	54	E		