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DF-3001

B. Sc. (Microbiology) (Sem. III) Examination

March / April - 2016

MB-06 : Bioenergetics & Enzymology

Time : Hours] [Total Marks :

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ B. Sc. (MICROBIOLOGY) (SEM. 3)

Name of the Subject :

☛ MB-06 : BIOENERGETICS & ENZYMOLOGY

☛ Subject Code No. : 3 0 0 1 ☛ Section No. (1, 2,.....) : Nil

Seat No. :

Student's Signature

(2) This exam contains 50 multiple choice questions, each worth I mark.

(3) Choose only ONE most appropriate answer per question.

(4) Do not crease or fold the answer sheet.

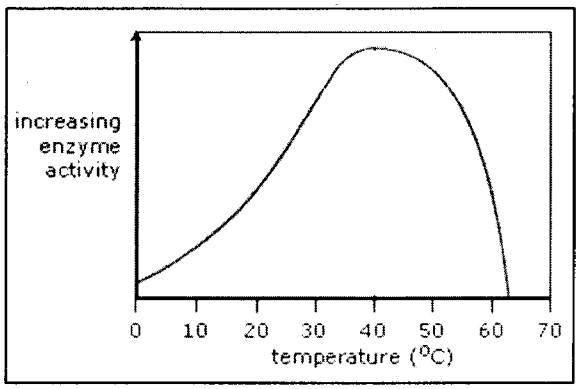
O.M.R. Sheet ભરવા અંગેની અગત્યની સૂચનાઓ આપેલ *O.M.R. Sheet*ની પાછળ છાપેલ છે.

Important instructions to fillup O.M.R. Sheet is given on back side of the provided O.M.R. Sheet.

1 Remarkable similarity has been found in the ribonuclease structure of :
(A) *E.coli* and humans
(B) Cows and humans
(C) Rat and *E.coli*
(D) Mice and humans

2 Lysozyme is also known as :
(A) All of these
(B) Muramidase
(C) RNase
(D) Ribonuclease

3 Identify correct optimum temperature for an enzyme from below graph :



(A) 60°C
(B) 10°C
(C) 30°C
(D) 40°C

4 Lysozyme is devoid of :
(A) Co-factors
(B) Co enzyme
(C) Co-enzyme or metal-ion co-factors
(D) Metal ion co-factors

5 Complex enzyme systems that are not independent molecules, but occurs as aggregates in a mosaic pattern involving several different enzymes are known as :
(A) None of these
(B) Multienzyme system
(C) Enzyme system
(D) Both Multienzyme system and Enzyme system

6 The shape of Lysozyme is :

(A) None of these

(B) Ellipsoidal

(C) Roughly ellipsoidal

(D) Smooth ellipsoidal

7 In trypsine, an aspartate residue is present at _____ :

(A) The top of S_2 pocket

(B) The bottom of the S_1 pocket

(C) The top of the S_1 pocket

(D) The bottom of the S_2 pocket

8 Activation energy is best defined as the difference between the :

(A) Molecular levels of the energy gap state and the normal state

(B) Energy levels of the ground state and the transition state

(C) Molecular levels of the ground state and the transition state

(D) Molecular levels of the ground state and the normal state

9 The higher activation energy, _____ reaction.

(A) All

(B) Neutral

(C) Faster

(D) Slower

10 In MM equation, the rate of appearance of products is proportional to the concentration of the enzyme-substrate complex which is generally expressed by the following equation :

(A) $K = V \neq (ES)$

(B) $V = K \neq (PS)$

(C) $V = K \neq (ES)$

(D) $K = V \neq (PS)$

11 During the experimental determination of K_m, the velocity of reaction is measured as the function of :

(A) Catalytic concentration

(B) Product concentration

(C) Enzyme concentration

(D) Substrate concentration

12 Enzyme Substrate complex are directly observed by :

(A) Electron microscope and X-ray crystallography

(B) Phase contrast microscope

(C) Compound microscope

(D) Darkfield microscope

13 Conformational changes during substrate binding and catalysis have been demonstrated for various enzymes such as :

(A) All of these

(B) Phosphoglucomutase

(C) Creatinine kinase

(D) Carboxypeptidase

14 K_m is defined as _____ in an enzyme catalysed reaction.

(A) Substrate concentration to produce half-maximum velocity

(B) Product concentration to produce half-maximum velocity

(C) Substrate concentration to produce maximum velocity

(D) Product concentration to produce maximum velocity

15 Zinc containing metalloenzyme is :

(A) All of these

(B) Alcohol dehydrogenase

(C) Alkaline phosphate

(D) Carbonic anhydrase

16 The chemical nature of inhibitors is :

(A) None of these

(B) Organic

(C) Inorganic

(D) Both Organic and Inorganic

17 Substrate analogue is the :

(A) Inhibitor which closely resembles the real substrate

(B) Isomer which closely resembles the real substrate

(C) Enzyme which closely resembles the real substrate

(D) Product which closely resembles the real substrate

18 Disadvantage of Lineweaver – Burk plot is :

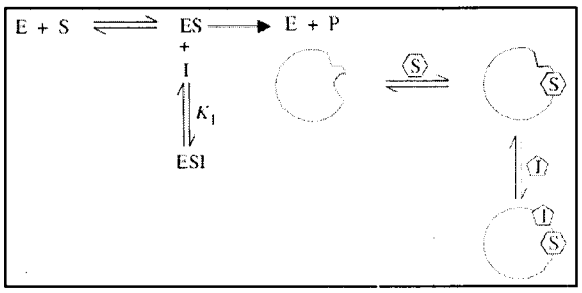
(A) None of these

(B) Long extrapolation to determine Km

(C) Uncertainty in results

(D) Both Long extrapolation to determine Km and Uncertainty in results

19 Identify the type of inhibition of enzyme shown below :



(A) Any of the these

(B) Noncompetitive inhibition

(C) Competitive inhibition

(D) Uncompetitive inhibition

20 A single crystal of protein or the protein fibers is capable of deflecting :

(A) None of these

(B) α rays

(C) β rays

(D) X-rays

21 Energy conserving reaction is also called :

(A) Fuelling reactions

(B) Anabolism

(C) Catabolism and fuelling reactions

(D) Catabolism

22 _____ organisms reducing the organic molecules by using CO_2 as carbon source with the release of both energy and electron.

(A) Chemoorganotrophs

(B) Chemolithoautotrophs

(C) Chemoheterotrophs

(D) Chemoorganoheterotrophs

23 Thermodynamics is a branch of science dealing with energy changes in a collection of matter, which is called :

(A) None of these

(B) System

(C) Assembly

(D) Reaction

24 The second law of thermodynamics involves, which of the following process?

(A) None of these

(B) Chemical

(C) Physical

(D) Both Chemical and Physical

25 One calorie of heat is equivalent to _____ Joules.

(A) 4.4840

(B) 4.4810

(C) 4.1840

(D) 4.8140

26 Identify the correct definition of equilibrium constant :

(A) Equilibrium is the state of a reaction where the rate of reaction in both sides is unequal, with no further net change occurring in the concentration of reactants.

(B) Equilibrium is the state of a reaction where the rate of reaction in both sides is unequal, with no further net change occurring in the concentration of reactants and products.

(C) Equilibrium is the state of a reaction where the rate of reaction in both sides is unequal, with no further net change occurring in the concentration of products.

(D) Equilibrium is the state of a reaction where the rate of reaction in both sides is equal, with no further net change occurring in the concentration of reactants and products.

27 What is the relationship between $\Delta G^{o\prime}$ and Keq ?

(A) $G^o = -2.303RT.LogKeq$

(B) $G^{o\prime} = -2.203RT.\ LogKeq$

(C) $G^{o\prime} = -2.303RT.LogKeq$

(D) $G^o = -2.203RT.LogKeq$

28 Endergonic reaction is said to be :

(A) When $\Delta G^{o\prime}$ is positive, the equilibrium constant is less than 2

(B) When $\Delta G^{o\prime}$ is negative, the equilibrium constant is less than 1

(C) When $\Delta G^{o\prime}$ is positive, the equilibrium constant is less than 1

(D) When $\Delta G^{o\prime}$ is negative, the equilibrium constant is less than 2

29 Which one is the true sentence for ATP in metabolism ?

(A) All of these

(B) ATP as a coupling agent

(C) ATP makes endergonic reactions more favourable

(D) ATP is formed by exergonic reactions

30 Peptidoglycan layer of the bacterial wall is activated by the higher energy compund of :

(A) Guanosine

(B) Cytidine

(C) Deoxythymidine

(D) Uridine

31 Which one is true for the standard reduction potential ?

(A) The equilibrium constant for reaction, E^o, is a measure of tendency of the acceptant to accept electron

(B) The equilibrium constant of a reaction, E^o, is a measure of tendency of the donor to lose electron

(C) The equilibrium constant of a reaction, E^o, is a measure of tendency of the donor to acquire electron

(D) The equilibrium constant for reaction, A^o, is a measure of tendency of the donor to lose electron

32 The reference standard for the reduction potential is :

(A) None of these

(B) Hydrogen system with an E'_o of – 0.42 volts

(C) Hydrogen system with an E'_o of – 420 millivolts

(D) Both Hydrogen system with an E'_o of – 0.42 volts and Hydrogen system with an E'_o of – 420 millivolts

33 The difference in reduction potentials between NAD + / NADH and $1/20_2/H_2O$ is :

(A) 1.15 volts

(B) 1.12 volts

(C) 1.13 volts

(D) 1.14 volts

34 Select the most suitable statement for ETC :

(A) The carriers are organized such that the first electron carrier has the most negative E'^o and each successive carrier is slightly less negative.

(B) The carriers are organized such that the first electron carrier has the positive E'^o and each successive carrier is slightly less negative.

(C) The carriers are organized such that the last electron carrier has the most negative E'^o and each successive carrier is negative.

(D) The carriers are organized such that the second electron carrier has the most negative E'^o and each successive carrier is more negative.

35 The nonheme iron protein active in photosynthetic electron transport system is _____.

(A) Co enzyme Q

(B) Ferredoxin

(C) Quinone

(D) Ubiquinone

36 Trypsine enzyme was isolated by John H. Northrop and Kunitz from :

(A) Swine stomach

(B) Beef kidney

(C) Beef liver

(D) Beef pancreas

37 The ratio of enzyme : substrate molecules can be as high as :

(A) 1 : 100000

(B) 1 : 1000

(C) 1 : 10000

(D) 1 : 50000

38 Enzymes, vitamins and hormones can be classified in a single category of biological chemicals because all of them are :

(A) Enhance the oxidative metabolism

(B) Proteins

(C) Aid in regulating metabolism

(D) Synthesized in organisms

39 Example of lipid hydrolyzing enzyme is :

(A) Dipeptidase

(B) Lecithinases

(C) Pepsin

(D) Bromolin

40 The enzymes, which act normally within cells, are called :

(A) Ferment

(B) Endoenzyme

(C) Exoenzyme

(D) Apoenzyme

41 Which of the following are co-enzymes ?

(A) NAD, K, CoA

(B) Vitamin, Fe, Cu

(C) $NADPH_2$, Ca, Co

(D) NAD, NADP, FAD, FMN

42 Which of the following is not an oxidation-reduction enzyme ?

(A) Hydrolases

(B) Mutases

(C) Sulfatases

(D) Oxidases

43 Radio immuno assay procedure for diagnosis cases of hypertension has been developed by :

(A) None of these

(B) BARC

(C) TIFR

(D) Both BARC and TIFR

44 Endonucleases promotes reactions leading to

(A) Recombination

(B) Polymerisation

(C) Co-angulations

(D) DNA fragmentation

45 Generally, co-enzymes accounts for about _____% of entire enzyme molecule.

(A) 4

(B) 1

(C) 2

(D) 3

46 The catalytic power of an enzyme is measured by the

(A) Topology

(B) Turn over number

(C) Molecular activity

(D) Both Turn over number and Molecular activity

47 A single molecule of enzyme catalase can convert _____ H_2O_2 molecules into H_2O and CO_2 in a minute.

(A) 50,00,000

(B) 5,000

(C) 50,000

(D) 5,00,000

48 The pattern of enzyme specificity has been recognised as :

(A) All of these

(B) Absolute specificity

(C) Group specificity

(D) Optical specificity

49 The enzyme specificity of sucrose has been found mainly for :

(A) Glucose

(B) Sucrose

(C) Raffinose

(D) Both Sucrose and Raffinose

50 The value used to measure the temperature sensitivity of a biological function is :

(A) None of these

(B) Temperature quotient

(C) Q_{10}

(D) Both of these