REV-01
MSZ/104/109

2022/07

M.Sc. ZOOLOGY
SECOND SEMESTER
MOLECULAR BIOLOGY & BIOCHEMISTRY
MSZ -202

(Use Separate Answer Scripts for Objective & Descriptive)

Duration:3 hrs. Full Marks:70

(PART-A: Objective)

Time: 20 min. Marks:20

Choose the correct answer from the following: ***1X20=20***

1. Which of the following statements is incorrect?
   a. The holoenzyme includes the sigma factor.
   b. The core enzyme includes the sigma factor
   c. It requires Mg 2+ for its activity
   d. It requires Zn 2+ for its activity
2. Pribnow box is centered at-
   a. +10
   b. -10
   c. +35
   d. -35
3. An aminoacyl t RNA synthetase is responsible for -
   a. Formation of a peptide bond
   b. Binding of mRNA to ribosomes
   c. Attaching an amino acid to organic acid.
   d. joining an amino acid to t RNA.
4. Synthesis of peptide bond is catalyzed by-
   a. A site of ribosome
   b. P site of ribosome
   c. 23S rRNA
   d. t RNA
5. Which of the following factors facilitates the initiation codon?
   a. IF-1
   b. IF-2
   c. IF-3
   d. All of the above
6. Which of the following enzyme catalyzes the reversible reaction of glycolysis?
   a. Glucokinase
   b. Phosphofructokinase
   c. Pyruvate kinase
   d. None of the above
7. Which compound generates acetyl-CoA?
   a. Lactate
   b. Pyruvate
   c. Glucose
   d. Fructose
8. Which enzyme catalyzes the conversion of pyruvate to oxaloacetate?
   a. Pyruvate carboxylase
   b. Pyruvate dehydrogenase
   c. Pyruvate kinase
   d. Phosphofructokinase

9. Each cycle of b-oxidation produces-
   a. 1 FAD, 1 NADH, and 1 acetyl-CoA.
   b. 1 FADH2, 1 NADH, and 1 acetyl-CoA
   c. 1 FAD, 1 NAD+, and 2 CO2 molecules.
   d. 1 FADH2, 1 NADH, and 2 CO2 molecules.

10. Transamination reaction in amino acid synthesis is catalysed by enzyme-
   a. Nitric oxide synthase
   b. Decarboxylase
   c. Aminotransferase
   d. Glutamate decarboxylase

11. When the velocity of enzyme activity is plotted against substrate concentration, which of the following is obtained?
   a Hyperbolic curve
   b. Parabola
   c Straight line with positive slope
   d. Straight line with negative slope

12. Which of the following rule was not given by the enzyme commission?
   a. Assigned each enzyme a name
   b. Assigned each enzyme a 4-digit code
   c. Divided enzymes into 6 main groups
   d. Mention of cofactors

13. In this below equation, Enzyme belongs to which class of enzymes?
   A-X + H_2O ----------> X-OH + AH
   a. Peroxidase
   b. Hydrolases
   c. Pectinase
   d. Aldolase

14. Which of the following statements are true regarding enzyme inhibition?
   a. It may be reversible or irreversible
   b. Reversible can be competitive or non-competitive
   c. Both a and b
   d. It is always reversible

15 Which of the following equation shows the relationship between free energy change (ΔG) and the change in entropy (ΔS), under constant temperature and pressure?
   a. $\Delta G = T\Delta H - \Delta S$
   b. $\Delta G = T\Delta H/\Delta S$
   c. $\Delta G = \Delta H/T\Delta S$
   d $\Delta G = \Delta H - T\Delta S$

16. What is the name of the molecule which donates its electrons?
   a. Reducing agent
   b. Oxidative agent
   c. Standard reduction potential
   d. Oxidant

17. Which form of DNA is described by Watson-Crick model?
   a. B-DNA
   b. Z-DNA
   c. A-DNA
   d. Quadraplex DNA

18 According to Chargaff's rule, in a DNA molecule-
   a. The amount of adenine and thymine is equal to the amount of guanine and cytosine
   b. The amount of adenine and guanine is equal to the amount of thymine and cytosine
   c. The amount of adenine and uracil is equal to the amount of guanine and cytosine
   d. The amount of adenine and guanine is equal to the amount of uracil and cytosine

19. DNA polymerase III has _____ subunits.

a. 4 b. 6

c. 8 d. 10

20. Which two Uvr component molecules scan the DNA during nucleotide excision repair?

a. UvrC, UvrA b. UvrA, UvrB

c. UvrB, UvrC d. UvrD, UvrA

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PART-B:Descriptive

Time : 2 hrs. 40 min. **Marks : 50**

[Answer question no.1 & any four (4) from the rest]

1.	What is the property of degeneracy of genetic code?What is the role of sigma factor in transcription?Differentiate between rho dependent and rho independent transcription in prokaryotes withdiagram.	2+2+6 =10
2.	Describe in details the splicing mechanism of RNA in prokaryotes.How does translation initiates in prokaryotes?	6+4=10
3.	Explain beta oxidation of fatty acid. How many ATP produced from oxidation of 15 Carbon fatty acid?	8+2=10
4.	Describe TCA cycle? Why TCA cycle is called amphibolic?	8+2=10
5.	Write a detailed note on factors affecting enzyme activity.	10
6.	What is Bio Energetics? Explain redox reaction with example. Write briefly how free energy changes in redox reaction.	2+4+4 =10
7.	Why is it important in mismatch repair that the cell distinguish the parentalstrands from newly synthesized strands? Contrastthe mechanism of nucleotideexcision repair with illustrations.	4+6=10
8.	Explain with proper illustration the mechanism of replication in telomeric site with the specific telomerase enzyme.	10

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