JAR-1603220001010400 Seat No. _____

B. Sc. (Bioinformatics) (Sem. I) (CBCS) Examination

December - 2019

BI - 104 : Fundamentals of Biochemistry & Biophysics

(New Course)

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) All questions are compulsory.
(2) The right side figure indicates total marks of the question.

1 The following questions from Unit-1 : **14**

(A) Attempt the following objective questions : **4**

(1) The pH of a solution is determined by _____ concentration.

(2) The H-O-H bond angle in water molecule is _____.

(3) A segment of DNA has 120 adenine and 120 cytosine bases. The total number of nucleotides present in the segment is _____

(4) How many pyrimidine bases are in GATCAATGC nucleotide sequence?

(B) Attempt any **one** out of two from the following : **2**

(1) Ionization of water

(2) Structure of atom

(C) Attempt any **one** out of two from the following : **3**

(1) pH Scale

(2) Bronstead concept of acid/base

(D) Attempt any **one** out of two from the following : **5**

(1) Explain Henderson and Haselbatch equation

(2) Explain non-covalent bonds/interactions: electrostatic (ionization), hydrogen bond, non-polar interaction (hydrophobic interaction), vander Walls interaction, dipolar interaction.

2 The following questions from Unit -2 : **14**

(A) Attempt the following objective questions : **4**

(1) Fat soluble Vitamins are _____

(2) Retinol is the scientific name of which Vitamin?

(3) The second law of thermodynamics says that _____ always increases with time.

(4) The most abundant free nucleotide in mammalian cells is _____.

(B) Attempt any **one** out of two from the following : **2**

(1) Structure of ATP

(2) Free energy

(C) Attempt any **one** out of two from the following : **3**

(1) Technique to study biomolecules : Sedimentation and Light scattering

(2) Write source, function, deficiency/disorders of Vitamin C.

(D) Attempt any **one** out of two from the following : **5**

(1) Fat soluble vitamins

(2) Laws of Thermodynamics : Zeroth, 1^{st}, 2^{nd}, 3^{rd}, Law.

3 The following questions from Unit-3 : **14**

(A) Attempt the following objective questions : **4**

(1) Enzyme term given by _____

(2) The Michaelis-Menton equation relates the rate of an enzyme-catalysed reaction to Substrate concentration. (True or False)

(3) Blocking of enzyme action by blocking its active sites is _____ inhibition.

(4) The combination of Apoenzyme and coenzyme is _____.

(B) Attempt any **one** out of two from the following : **2**

(1) Active site

(2) Effects of temperature & pH on enzyme.

(C) Attempt any **one** out of two from the following : **3**

(1) Mechanism of enzyme action or Lock & Key model and Induce-fit model

(2) Explain inhibition : competitive and non-competitive inhibition.

(D) Attempt any **one** out of two from the following : **5**

(1) Explain enzyme classification with one example in each class.

(2) Explain M. M. Equation along with Line-Weaver Burk Equation. Write significance of K_m and V_{max}

4 The following questions from Unit-4 : **14**

(A) Attempt the following objective questions : **4**

(1) Six member ring structure of monosachharide are called as _____

(2) The enzymes of beta-oxidation are found in _____

(3) The number of molecules of ATP produced by the total oxidation of acetyl CoA in TCA cycle is _____

(4) D-Glucose and D mannose are epimer. (True or False)

(B) Attempt any **one** out of two from the following : **2**

(1) Draw the structure of glucose

(2) Mutarotation

(C) Attempt any **one** out of two from the following : **3**

(1) Lipid function

(2) Disaccharides

(D) Attempt any **one** out of two from the following : **5**

(1) Beta oxidation of fatty acids

(2) Glycolysis

5 The following questions from Unit-5 : **14**

(A) Attempt the following objective questions : **4**

(1) Which type of RNA is smallest?

(2) Amino acids are joined by _____ bond.

(3) Hemoglobin is the example of _____ protein structure.

(4) Which Nucleotide form hydrogen bonds with thymine in DNA?

(B) Attempt any **one** out of two from the following : **2**

(1) Types of RNA

(2) Pyrimidines

(C) Attempt any **one** out of two from the following : **3**

(1) Difference between DNA and RNA

(2) Explain urea cycle

(D) Attempt any **one** out of two from the following : **5**

(1) Protein Primary Structure Determination : Sanger's method

(2) Explain denovo synthesis of purine