B.Sc. Part-I (Semester–I) Examination

1S : BIOCHEMISTRY

(Biomolecules and Nutrition)

Time : Three Hours] [Maximum Marks : 80

Note :— All questions are compulsory and carry equal marks except question No. 1 carrying 8 marks.

1. (A) Fill in the blanks (½ mark each) :

(i) The charged molecule which is electrically neutral is known as _____. ½

(ii) Nucleic acids are polymers of _____. ½

(iii) The Pyrimidine present in DNA but absent in RNA is _____. ½

(iv) The vitamin required for carboxylation reaction is _____. ½

(B) Choose the correct alternatives :

(1) Which one of the following is not a basic amino acid ?

(a) Arginine (b) Histidine

(c) Lysine (d) Glycine ½

(2) Deficiency of which one of the following causes Night blindness ?

(a) Vitamin A (b) Vitamin K

(c) Vitamin C (d) Vitamin D ½

(3) Number of base pairs present in B-DNA are :

(a) 10 (b) 11

(c) 9 (d) 7 ½

(4) One gram of carbohydrate produces :

(a) 4 K cal (b) 9 K cal

(c) 10 K cal (d) 3 K cal ½

(C) Answer in one sentence :

(a) Define essentials of Amino Acids 1

(b) Define RQ 1

(c) Define Acid Value 1

(d) Define Vitamin. 1

2. Describe structure and functions of cellulose, starch and chondriotin sulfate. 12

OR

Describe with examples Mutarotation, Optical Activity and Epimerism in Carbohydrates. 12

3. (a) Discuss with examples Saponification value and Iodine number of fats. 4

(b) Describe structure and functions of sphingomyelin. 4

(c) Describe structure and functions of Ergosterol. 4

OR

(p) Discuss Nomenclature and structures of unsaturated fatty acids. 4

(q) Discuss the Chemistry and functions of Gangliosides. 4

(r) Explain Rancidity of fats. 4

4. Describe classification of proteins based on solubility, shape and composition and add a note on Zwitter ionic structure of amino acids. 12

OR

Describe structure and functions of Myoglobin, Keratins and add a note on salting out of Proteins. 12

5. (a) Explain the importance of Iodine and Calcium in human nutrition. 4

(b) Explain diet for old persons. 4

(c) Describe in brief nutritional importance of proteins. 4

OR

(p) Describe Fatty liver. 4

(q) Explain the concept of SDA and RQ. 4

(r) Explain Nutritional importance of lipids. 4

6. (a) Draw the structure of ATP, GTP, TTP and CTP. 4

(b) Describe in brief double Helical Structure of DNA. 4

(c) Describe Hershey and Chase experiment. 4

OR

(p) Explain Physiological role of Bile pigments. 4

(q) Explain chemistry of Cytochromes. 4

(r) Describe structure and functions of t-RNA. 4

7. (a) Describe structure, functions and deficiency of Vitamin B_6. 4

(b) Describe Chemistry and functions of Hormones of Adrenal Medulla. 4

(c) Describe sources, daily allowances and functions of Vitamin B_{12}. 4

OR

(p) Describe Hormones of Posterior Pituitary Gland. 4

(q) Describe classification of Hormones. 4

(r) Describe structure and functions of Vitamin D. 4