



MBBS FIRST PROFESSIONAL (PART-I)
MODEL PAPER FOR ANNUAL 2009
Biochemistry
(Short Essay Questions)

Max. Marks 32.5

Time Allowed 2 hours

1. a) What are the intracellular events following the activation of Gq protein? 2
b) Define osmotic pressure. What is the importance of osmotic pressure exerted by plasma proteins? 2
2. a) A young lady presents to the clinic with complaints of alternating diarrhea and constipation. She complains of abdominal discomfort and bloating that is relieved with her bowel movement. She states that her episodes are worse in times of stress. She denies any blood in her diarrheal stools. Her physical examination is all within normal range. She has been prescribed a cellulose containing dietary supplement, which her doctor says will increase the bulk of her stool. She was diagnosed as a case of irritable bowel syndrome:
i) What is the biochemical mechanism of this dietary supplement's effect on the intestines? 1
ii) What is the structure of cellulose? 0.5
iii) What is hemicellulose? 0.5
b) What do you understand by omega-3 fatty acids? What are the principal biologic functions of prostacyclin and leukotriene B4? 2
3. a) What is the role of amino acid side chain (R group) in protein folding? Briefly describe the relationship of protein structure to its function. Give at least one example. 2
b) What are different types of immunoglobulins? Give clinical significance of IgG and IgE. 1,1
4. a) Define nucleosides and nucleotides. Write down important functions of nucleotides in human body. 2
b) Write down the role of Selenium as an antioxidant. 2
5. a) How can you differentiate competitive inhibition from the non-competitive inhibition of enzyme activity? 2
b) Enumerate two clinically important enzyme inhibitors along with examples of enzymes inhibited by them. 2
6. a) What is the mechanism of action of retinol in extraocular tissue? 2
b) A woman who suffers from chronic peptic ulcer undergoes gastrectomy. After some years she starts suffering from lethargy, tiredness and 'pins and needles' sensation in her lower limbs. The doctor on examination finds her to be anaemic and diagnoses PERIPHERAL NEUROPATHY. Her blood test reveals low Hb, 8.1 g/dl (normal 12-16 g/dl). Peripheral smear shows macrocytosis. The serum B12 level is 8ng/dl (normal 10-70 ng/dl):
i) Which vitamin is likely to be deficient and why? 0.5
ii) Write down two reactions in the body in which this vitamin is required as coenzyme. 0.5
iii) What is folate trap hypothesis? 1
iv) What is the biochemical defect underlying neuropathy? 0.5
7. a) Define the terms: Body Mass Index (BMI), Basal Metabolic Rate (BMR), Waist to Hip Ratio (WHR), Resting Metabolic Rate (RMR), Thermogenic Effect of Food. 2.5
b) What is glycemic index of food? 1.5
8. What are thalassemias? Describe various types of alpha thalassemias? 1,3