

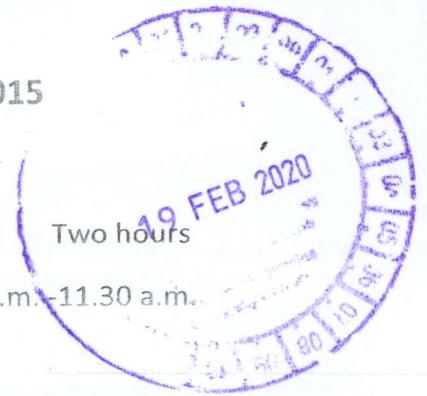


Cell Biology and Biochemistry

28th December 2015

Answer any four questions.

9.30 a.m. - 11.30 a.m.



Marks allocated to each question are given within parenthesis.

1. 1.1 1.1.1 Explain the biochemical basis for the formation of cataract in an individual with galactose 1-phosphate uridylyltransferase deficiency. (30 marks) 42
- 1.1.2 Explain the biochemical significance of performing following tests on the urine sample of the above patient.
- (a) Benedict test (10 marks)
- (b) Barfoed test (10 marks)
- (c) Osazone test (10 marks)
- 1.2 "Glycogen metabolism is triggered by adrenaline in liver cells". Explain the above statement by giving the molecular mechanisms involved. (40 marks)
2. 2.1 List the lipoproteins present in a plasma sample of an individual after an overnight fast. (10 marks)
- 2.2 Using diagrams, briefly explain two laboratory techniques that can be used to observe the distribution of lipoproteins in a serum/plasma sample. (30 marks)
- 2.3 Explain the criteria to be considered before a sample of blood is collected to perform a lipid profile. (30 marks)
- 2.4 "Elevated level of LDL-cholesterol leads to atherosclerosis". Explain. (30 marks)
3. Explain the biochemical basis of the following.
- 3.1 Newborns are at a higher risk of developing hemorrhagic diseases. (30 marks)
- 3.2 α - tocopherols protect membranes from lipid peroxidation. (30 marks)
- 3.3 Polymerization of HbS leads to anaemia in patients with sickle cell disease. (40 marks) 42

4. 4.1 4.1.1 Explain the biochemical basis for the occurrence of neural dysfunction in hyperammonaemia. (15 marks)
- 4.1.2 State the rationale behind the estimation of serum creatinine concentration, as an estimation of renal function. (15 marks)
- 4.1.3 Briefly explain the transcription of protein biosynthesis in an eukaryotic cell. (20 marks)
- 4.2 Explain the biochemical basis of the following.
- 4.2.1 Zn supplementation is recommended for post surgical patients. (25 marks)
- 4.2.2 Excessive intake of fluoride could be harmful. (25 marks)
5. 5.1 "Congenital disorders of purine metabolism could lead to severe combined immune deficiency". Explain. (40 marks)
- 5.2 Briefly explain the mechanism of action of the following.
- 5.2.1 Cholera toxin. (30 marks)
- 5.2.2 Atrial natriuretic peptides. (30 marks)
