

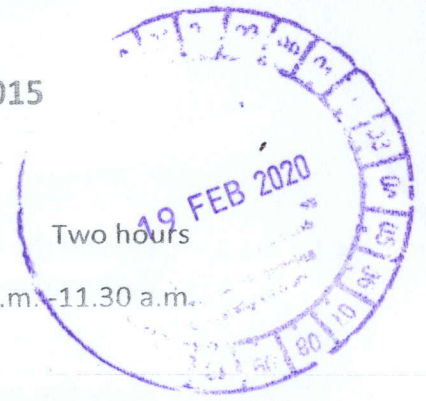


Cell Biology and Biochemistry

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)
- 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)

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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)
