

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034****M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY****FIRST SEMESTER – NOVEMBER 2023****PBT1MC02 – BIOMOLECULES AND METABOLISM**

Date: 03-11-2023

Dept. No. 

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

**SECTION A – K1 (CO1)****Answer ALL the questions****(5 x 1 = 5)****1 Choose the best option**

- a) Lipid molecules are \_\_\_\_\_.
- i) Hydrophobic      ii) Hydrophillic      iii) Zwitter ions      iv) Neutral
- b) The biochemical reaction in which the energy is released is
- i) Endogonic reactions      ii) Exergonic reactions  
iii) Electron transport chain      iv) Phosphorylation
- c) Which of the following amino acids is considered as both ketogenic and glucogenic?
- i) Lysine      ii) Valine      iii) Tryptophan      iv) Proline
- d) Which of the following lipid is mostly present in mitochondrial membranes?
- i) Cardiolipin      ii) Lecithin      iii) Cephalin      iv) Ceramide
- e) Which juice secreted in the alimentary canal plays a vital role in the digestion of fats?
- ii) Saliva, HCl      ii) Pancreatic juice, Saliva  
iii) Bile juice, Pancreatic juice      iv) HCl, Mucus

**SECTION A – K2 (CO1)****Answer ALL the questions****(5 x 1 = 5)****2 Answer in one or two sentences**

- a) Distinguish between nucleoside and nucleotide.
- b) Comment on G-3-P shuttle.
- c) Define biological polymers.
- d) Identify the complications of hyperlipoproteinemia.
- e) Differentiate prebiotic and probiotic.

**SECTION B – K3 (CO2)****Answer any THREE of the following****(3 x 10 = 30)**

- 3 Classify essential and non-essential amino acid with examples for each class.
- 4 Differentiate between the chemiosmotic mechanisms of ATP synthesis in mitochondria and chloroplast.

5	Explain pyruvate metabolism and enzyme activities where it takes place.
6	Discuss the importance of lipoproteins and mention various causes of hyperlipoproteinemia.
7	Write the importance and significance of water soluble vitamins and fat soluble vitamins.

**SECTION C – K4 (CO3)**

	<b>Answer any TWO of the following</b> <span style="float: right;"><b>(2 x 12.5 = 25)</b></span>
8	Give an account on the biosynthesis of saturated and unsaturated fatty acids.
9	'Bioenergetics of a cell relies on free energy available in a cell to proceed with biochemical reactions'. Support the statement with detailed answer.
10	Mention inborn errors of metabolism and discuss in detail on any two of them.
11	Define ketone bodies. Describe the formation and fate of ketone bodies. Add a note on ketosis.

**SECTION D – K5 (CO4)**

	<b>Answer any ONE of the following</b> <span style="float: right;"><b>(1 x 15 = 15)</b></span>
12	C3 and C4 cycle of photosynthesis are interlinked in some of the tropical plants. Explain the mechanism and evaluate.
13	Describe the detoxication of ammonia by urea cycle. Explain its regulation and disorders.

**SECTION E – K6 (CO5)**

	<b>Answer any ONE of the following</b> <span style="float: right;"><b>(1 x 20 = 20)</b></span>
14	Enumerate the gluconeogenic substrates and energetics reactions of gluconeogenesis.
15	Diagnosing different lipid, protein, and carbohydrate metabolic diseases can be done with the aid of blood serum profiles. Justify.

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