


<b>Name:</b>	 <b>UPES</b> <small>UNIVERSITY WITH A PURPOSE</small>
<b>Enrolment No:</b>	

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**Online End Semester Examination, May 2020**

**Course: MSc. Biochemistry**  
**Program: MSc. Microbiology**  
**Course Code: I.VR\_B\_1021**

**Semester: I**  
**Time 03 hrs.**  
**Max. Marks: 100**

**SECTION A**

- 1. Each Question will carry 5 Marks**
- 2. Instruction: Complete the statement / Select the correct answer(s)**

S. No.	Question	CO
Q 1	a. ----- is a phosphoshingolipid and is present in ..... of neurons. b. Kcat for Cytidine deaminase (enzyme A) is $300 \text{ s}^{-1}$ , Km for Cytidine is 15 M. There is another enzyme (enzyme B) which has Kcat of $200 \text{ s}^{-1}$ and Km for cytidine is 10 M. Calculate catalytic efficiency and write which one has higher affinity. A) $10 \text{ M}^{-1}\text{s}^{-1}$ , $15 \text{ M}^{-1}\text{s}^{-1}$ , enzyme A B) $10 \text{ M}^{-1}\text{s}^{-1}$ , $10 \text{ M}^{-1}\text{s}^{-1}$ , enzyme A C) $20 \text{ M}^{-1}\text{s}^{-1}$ , $20 \text{ M}^{-1}\text{s}^{-1}$ , enzyme B D) $10 \text{ M}^{-1}\text{s}^{-1}$ , $15 \text{ M}^{-1}\text{s}^{-1}$ , enzyme B	<b>C4/5</b>
Q2	a. Cholesterol biosynthesis happens in ----- of the cell while beta oxidation happens in ..... b. Gluconeogenesis is reverse of glycolysis. True/False  c. At high ADP/ATP ratio cell would prefer ----- (Glycolysis/Gluconeogenesis).  d. Pentose phosphate phosphate pathway generates ----- (any one of two products).	<b>CO2</b>
Q3	a. At Isoelectric pH the net charge on protein is ----- b. All proteins fold spontaneously True/False c. ATP:ADP ratio is maintained in the cell. Is it: A) High B) Low C) 1 D) Changes with cellular needs d. An analytical method of separation of proteins based on mol. weight is called ----- while chromatographic method of separation of proteins based on mol. weight is called -----	<b>CO3</b>

Q4	<p>a. Biological membranes are asymmetric. True/False.</p> <p>b. Lateral diffusion of lipids is allowed and frequent while transverse diffusion is rare and catalysed event. True/False</p> <p>c. ----- are ether containing lipids.</p> <p>d. Fatty acyl derivate of Sphingosine is called -----</p> <p>e. Glycolysis happens in both aerobic and anaerobic bacteria. True/False</p>	<b>CO4</b>
Q5	<p>a. Being a biochemist, you analyse the following pathway; you observe that intermediate B accumulates in the cells you are using</p> <div style="text-align: center; margin: 10px 0;"> <math display="block">A \xrightarrow{\text{Enzyme 1}} B \xrightarrow{\text{Enzyme 2}} C \xrightarrow{\text{Enzyme 3}} D</math> </div> <p>What could be the reason? The cell is defective in:</p> <p>A) Enzyme 1 B) Enzyme 3 C) Enzyme 2 D) Both B and C</p> <p>b. You made extract of these cells above and added intermediate C and found that C is converted to D but B still accumulates. Now which enzyme do you think is definitely missing?</p> <p>A) Enzyme 2 B) Enzyme 3 C) Enzyme 1 D) All of the above</p> <p>c. Negative log of hydronium ion concentration is known as -----</p>	<b>CO1</b>
Q6	<p>-----, -----, -----, -----, ----- ----- are coenzymes of Pyruvate Dehydrogenase.</p>	<b>CO5</b>
<p><b>SECTION B</b></p> <p><b>1. Each question will carry 10 marks</b></p> <p><b>2. Instruction: Write short / brief notes</b></p>		
Q7	<p>a. Give an account of high energy compounds in cell with examples. OR Explain what happens to bacterial cell membrane if you grow bacteria at low temperature versus at high temp.</p>	<b>CO4</b>
Q8	<p>Draw glycolytic pathway with the help of flow chart. Contrast it with Gluconeogenesis.</p>	<b>CO2</b>

Q 9	<p>a. What is Hydropathy index. Preferably draw an imaginary plot and explain.</p> <p>b. Define Circular Dichroism. What is it used for? Show a typical plot of CD.</p> <p style="text-align: center;">OR</p> <p>What does ATP synthase do? Explain its structure with aid of a diagram.</p>	<b>CO2/3</b>
Q 10	<p>Define a glycosidic bond, name its types and also draw at least two disaccharides.</p> <p style="text-align: center;">OR</p> <p>Explain why did cell chose to keep two oxygen binding proteins Myoglobin and Hemoglobin. What are the differences between them.</p>	<b>CO2/3</b>
Q 11	<p>Compare and contrast alpha helix and beta sheets. Give examples.</p> <p style="text-align: center;">OR</p> <p>Explain Ramachandran plot with the help of suitable diagram and and perhaps a plot.</p>	<b>CO3</b>
<b>Section C</b>		
<p><b>1. Each Question carries 20 Marks.</b></p> <p><b>2. Instruction: Write long answer.</b></p>		
Q12	<p>Explain with help of illustrations biomembranes. Which model of plasma membrane is accepted. Give details of this model.</p> <p style="text-align: center;">OR</p> <p>Derive Michelis menten equation. And explain it. Also, write line weaver burk's equation.</p> <p style="text-align: center;">OR</p> <p>Explain why is citric acid cycle called amphibolic.</p>	<b>CO2/4/5</b>