**BIRLA INSITUTE OF TECHNOLOGY AND SCIENCES PILANI, Hyderabad Campus**

**Comprehensive examination 2022-2023 1st semester; 17th December 2022**

**BIOCHEMISTRY (BIOF211) CLOSED BOOK (Total 30 Marks) Maximum time (60 minutes)**

**PART B**

1. Cytochrome oxidase and succinate-CoQ oxidoreductase are isolated from mitochondria and are incubated in the presence of oxygen, along with cytochrome C, coenzyme Q, and succinate. What is the most likely oxidation-reduction reaction that may happen? Justify your answer. **3M**
2. Comment on the following statement – The role of the proton gradient in chemiosmosis is to provide the energy to phosphorylate ATP” **3M**
3. Identify which of the following is not a redox reaction and, justify your answer – **3M**
4. Fumarate to malate conversion
5. Succinate to fumarate
6. Citrate to isocitrate
7. What are the possible metabolic fates of pyruvates after glycolysis? **3M**
8. Suggest why a different reducing agent (NADPH) is used in anabolic reactions and NADH in catabolic reactions? **3M**
9. Would you expect the citric acid cycle to be more or less active when a cell has a) a high ATP/ADP and b) a high NADH/NAD+ ratio? Justify your answer. **4M**
10. What is the most important difference between the biosynthesis of purine nucleotides and pyrimidine nucleotides? **2M**
11. What is the end product of purine degradation in humans? How gout, is related to this end product?  **3M**
12. Name three carrier molecules involved in the one-carbon unit transfer. Mention three biochemical pathways where these one-carbon units are involved.  **6M**