SBI4U, 2022

**UNIT#2 REVIEWS: METABOLIC PROCESSES**

# CHAPTER#3 (An intro to metabolism)

*TERMS TO LEARN:

* **Metabolism**
* **Kinetic energy**
* **Potential energy**
* **Bond energy**
* **Exothermic energy**
* **Endothermic energy**
* **Gibbs Free energy (ΔG):**
  1. **Negative free energy (-ΔG )=exothermic/spontaneous reaction**
  2. **positive (+ΔG )=endothermic/non-spontaneous reaction**
* **Catabolic (respiration) & anabolic pathway (photosynthesis)**
* **Phosphorylation (transfer of P from ATP to another molecule)**
* **Hydrolysis of ATP (ATP to ADP+iP)**
* **Dehydrogenase**

*Thermodynamics Law:

1. First Law/ the law of energy conservation
2. Second law (Entropy)

*Sample problem: pg#130-133; sample solution 1, 3, exercise:2)

**Enzymes as Catalysts: How does an enzyme work? (**with diagram of ‘Key and Lock’ theory) Factors that affect enzymes activity (Substrate conc.; Enzyme conc.; Temp.; pH)**

*Why Glucose molecules are known as the ‘universal storage of energy’ or ‘food as fuel’?

**Exercise: Chapter#3**

* SELF QUIZ PG# 159 (all questions)
* Pg# 160-165

Q# 2, 3, 4, 6, 7, 10, 20, 21, 23, 37, 43, 59, 73

# CHAPTER# 4 (Cellular respiration)

*TERMS TO LEARN:

* + **Aerobic respiration (with equation)**
  + **Glycolysis**
  + **TCA/ Krebs cycle**
  + **Pyruvate oxidation**
  + **Beta-oxidation**
  + **ETC**
  + **Chemiosmosis**
  + **ATP synthase**
  + **BMR (Basal Metabolic Rate)**
  + **Lactate fermentation**

*Compare and contrast:

* + Photosynthesis & cellular respiration
  + Cellular respiration & Fermentation
  + *Aerobic respiration & Anaerobic respiration Overview of cellular respiration (Fig. 2; pg# 169)

*Labelled diagram of Mitochondrion and name of the reaction/s take place in each of inner compartment of a Mitochondrion (Fig. 3; pg# 170)

*Full name of: ATP; NADH; GTP; FAD+; G3P; RuBP

*Total ATP yield by aerobic respiration (Fig. 1; pg#184)

**Exercise: Chapter#4**

SELF QUIZ (ALL QUESTIONS; PG# 203) Pg# 204-209

Q.1, 4, 6, 19, 20, 25, 29, 32, 38, 41, 68, 74

# CHAPTER# 5(Photosynthesis: The Energy Of Life)

*TERMS TO LEARN

* + ***Photosynthesis***
  + ***PS (Photosystem) I & II***
  + ***Rubisco***
  + ***Photorespiration***
  + ***CAM***

***Briefly describe the two stages of photosynthesis (Fig. 2; pg# 212) **Labelled diagram of ‘A leaf (CS)’ and ‘A chloroplast’ (Fig. 3; pg# 214)** What happened in Calvin cycle (overview) (Fig. 7; pg# 226)

*Compare and contrast:

1. C3 vs. C4 plants
2. Mitochondrion vs. Chloroplast
3. Respiration vs. Photosynthesis
4. *Light-dependent vs. light-independent reaction of photosynthesis Comparison of plant and animal demands for energy and materials (Table. 1; pg# 239)

**Exercise: Chapter 5**

SELF QUIZ (ALL QUESTIONS; PG# 245) Pg# 246-251

Q.2, 3, 4, 5, 9, 21, 30, 38, 48, 50, 62, 83