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Course Name: BSc Toxicology, Semester-III End term Examination (2022-23)

Paper Name: Molecular and Biochemical Basic of Toxicology Paper Code: BTX-CC09

Time: 3 hrs Maximum Marks: 75

Q.1. Attempt all the questions (15x1=15)

I. Which of the following are often used as a biomarker of oxidative stress?

a). 8-oxoAde b). FapyAde c). 8-OxoGua d). FapyGua

II. Why certain proteins are more susceptible to oxidation than others?
III. BER uses specific .....to release the damaged base leaving an AP site.
IV. Formation of isopeptide bond takes place between.....and.....
V. p53 can activate_____ proteins when DNA has sustained damage.
VI. Metalloenzyme catalyzes the dismutation of superoxide anion free radical ($O_2^{\cdot-}$) into_____ and_____.
VII. Write the name of the caspase-independent pathway of the cell death mechanism.
VIII. Caspases stands for_____
IX. How many glutathiones are present in the oxidized form of glutathione?
X. Write the names of the amino acids that participate in the formation of glutathione.
XI. SOD converts superoxide free radical into_____
XII. Write the structure of metallothionein.
XIII. Retinopathy occurs due to the deficiency of_____
XIV. FapyGua, which originates from the addition of the hydroxyl radical to the_____ position of the guanine ring.
XV. MDA is an oxidative stress product of which biomolecule? _____

Q.2 Explain any three (3x5=15)

A. Action mechanism of SOD
B. Mitochondrial membrane permeability
C. Alpha-tocopherol as an antioxidant
D. Necrotic cell death mechanism
E. Action mechanism of Metallothioneins

Q.3. Answer any three in brief (3x5=15)

A. Why does protein undergo the process of ubiquitination? Elucidate the role of the proteasome in ubiquitination.
B. How is DNA protected from the deleterious effects of oxidative stress? Explain with the help of example.
C. What role does apoptosis play during the process of development?
D. How ROS generation takes place during the process of the electron transport chain?

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Q.4. Write down the toxicological consequences of increased intracellular calcium concentrations.

[OR]

Discuss glutathione, its synthesis, functions, and its role.

Q. 5. Define oxidative stress and how it leads to DNA damage, and explain in detail.

[OR]

How do different toxic chemicals disrupt oxidative phosphorylation, discuss in detail.