Avinashilingam Institute for Home Science and Higher Education for Women

Deemed to be University Estd. u/s 3 of UGC Act 1956, Category A by MHRD (now MoE)
Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC
Coimbatore - 641 043, Tamil Nadu, India

Master's Degree Examination – May 2025
II Semester

Class : I P.G. **Time: 3 Hours**
Major : Food Service Management and Dietetics **Max. Marks: 100**

23MBCI01 Natural Antioxidants in Human Health and Diseases

Course Outcomes:
CO1: Acquire knowledge about the free radicals and oxidative stress
CO2: Understand the pathophysiology of oxidative stress associated diseases
CO3: Attain knowledge about different criteria of antioxidants classification and their role incombating free radical- induced diseases
CO4: Identify different phytoconstituents with antioxidant activity
CO5: Explore the role of antioxidants to neutralize free radicals and combat oxidative stress

Part A **10 x 1 = 10**
Choose the Correct Answer

1. Identify the molecule that is most commonly associated with the formation of free radicals in the body? CO1K1
   a. Hydrogen b. Oxygen c. Nitrogen d. Carbon

2. Which of the following is an antioxidant that helps combat oxidative stress? CO1K2
   a. Vitamin C b. Vitamin D c. Iron d. Glucose

3. The genetic mutation causing Huntington's disease is inherited in which pattern? CO2K1
   a. X-linked recessive b. X-linked dominant
   c. Autosomal recessive d. Autosomal dominant

4. Find an example of a biomarker for oxidative stress in cancer from the following. CO2K2
   a. Malondialdehyde (MDA) b. Interleukin-6 (IL-6)
   c. C-reactive protein (CRP) d. p53 tumor suppressor gene

5. Name the molecule that is considered as a Class II antioxidant because it helps to regenerate other antioxidants, such as vitamin E? CO3K1
   a. Glutathione b. Coenzyme Q10 c. Ascorbic acid d. Lipoic acid

6. Which of the following antioxidants is lipid-soluble and protects cellular membranes from oxidative damage? CO3K2
a. Vitamin C b. Vitamin E c. Glutathione d. Alpha-lipoic acid

7. Mention a polyphenol-rich food that is also known for its anti-inflammatory properties in the following. CO4K1
a. Spinach b. Dark chocolate c. Chicken d. Cheese

8. Show the enzyme that is responsible for recycling oxidized glutathione back to its active form? CO4K2
a. Glutathione reductase b. Superoxide dismutase
c. Catalase d. Glutathione peroxidase

9. Find a potent antioxidant compound found in green tea that neutralizes free radicals? CO5K1
a. Quercetin b. Lutein c. Catechins d. Carotenoids

10. Name the process by which antioxidants neutralize free radicals and prevent cellular damage. CO5K2
a. Oxidative stress b. DNA repair
c. Free radical formation d. Redox reaction

Part B **5 x 6 = 30**

Answer ALL questions

Each answer should not exceed 400 words or two pages

11.a. Discuss on free radicals and its harmful effects. CO1K2

(or)

11.b. Write about oxidative stress and its endogenous generation. CO1K3

12.a. Focus on the role of oxidative stress in diabetis mellitus. CO2K4

(or)

12.b. Explain the role of oxidative stress in rheumatoid arthritis. CO2K3

13.a. Describe synthetic antioxidants with its characteristics and importance. CO3K2

(or)

13.b. Outline on non-enzymic antioxidants for its oxygen scavenging and reducing activities. CO3K4

14.a. Explain the structure and functions of flavonoids and anthocyanins. CO4K4

(or)

14.b. Infer on the structure and functions of glutathione transferase and glutathione reductase. CO4K4

15.a. Illustrate on the principle and applications of DPPH assay. CO5K4

(or)

15.b. Write about the antioxidant supplements in health and disease condition. CO5K3

Part C 5 x 12 = 60

Answer ALL questions

Each answer should not exceed 800 words or four pages

16.a. Discuss on the types of ROS, RNS and RSS. CO1K2

(or)

16.b. Write about the biomolecular damage on lipids and proteins by free radicals. CO1K3

17.a. Summarize on the role of oxidative stress in cancer and atherosclerosis. CO2K2

(or)

17.b. Explain the role of oxidative stress in alzheimer's and parkinson's disease. CO2K3

18.a. Outline on the preventive nature of various class II antioxidants. CO3K4

(or)

18.b. Show the mechanism of action of Catalase and SOD in oxygen scavenging and reducing action. CO3K3

19.a. Elaborate on the action of alkaloids and tannins. CO4K4

(or)

19.b. Explain the mechanism of action of vitamin A, C and E. CO4K3

20.a. Summarize on neutralizing free radicals and combating oxidative stress in health and disease. CO5K5

(or)

20.b. Examine the free radical antioxidant's imbalance leading to degenerative diseases. CO5K4

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