

2023

FOOD INDUSTRY WASTE MANAGEMENT*Full Marks: 100*

Time: Three hours

*The figures in the margin indicate full marks for the questions.**Answer any five questions.*

1.	a)	Fill in the blanks:	1×5=5
	i)	BOD ₅ of treated water as per EPA Act 1986 should be _____ for disposal on land.	
	ii)	Algal blooms occur on the surface of water bodies due to the presence of higher amount of nitrogen and _____.	
	iii)	_____ oxidant is used during the chemical oxygen demand (COD) test.	
	iv)	As per EPA Act 1986 the pH of water should be _____ for disposal.	
	v)	The minimum amount of dissolved oxygen to be present in natural water body to sustain aquatic life is _____.	
	b)	Write true or false	1×5=5
	i)	Brine waters cause metal corrosion and toxic environment to freshwater aquatic animals.	
	ii)	BOD is determined under aerobic condition.	
	iii)	Molasses from sugar mills can be used in pulp and paper industry as raw materials.	
	iv)	Heavy suspended solids form sludge deposits in the ponds.	
	v)	Disposal of organic waste in the natural water body will decrease dissolved oxygen.	
	c)	Describe the procedure to determine dissolved oxygen (DO) of a water sample.	8
	d)	Differentiate between BOD and COD.	2

2.	(a)	Discuss the various waste generated in dairy processing industry mentioning the processing operations of food sources during which those waste is produced. Highlight the utilizations of dairy processing wastes.	5+5=10
	b)	Give some detail about the wastage or losses that occur during rice milling industries.	5
	c)	What are the various by-products that can be produced from the solid waste from fruits and vegetable processing industries?	5
3.	Write short notes on (Any four)		4×5=20
	a)	Characteristics of wastes generated in meat processing industry.	
	b)	Utilization of the wastes generated in meat processing industry.	
	e)	Characteristics of waste generated in fish processing industry.	
	f)	Utilization of the wastes generated in fish processing industry.	
	g)	Characteristics of waste generated in oilseeds processing industry.	
	h)	Utilization of the wastes generated in oilseeds processing industry.	
4.	a)	What is preliminary treatment of wastewater? Describe the various unit operations used during the preliminary treatment of wastewater.	1+6=7
	b)	Explain the sedimentation process of wastewater treatment with suitable diagram.	4
	c)	Describe coagulation and flocculation assisted sedimentation process with diagram.	5
	d)	Briefly explain the dissolved air floatation process of wastewater treatment with suitable diagram.	4
5.	a)	What is vermicomposting? Write the advantages of vermicompost.	2+2
	b)	Discuss the various steps involve in vermicomposting technique by giving a schematic diagram.	10
	c)	Discuss the various types of Aerobic Composting techniques.	6
6.	Write short notes on the followings		4×5=20
	a)	Greenhouse gases	

	b)	Pyrolysis	
	c)	Incineration	
	d)	Hazardous wastes	
	e)	Rubbish and garbage	
7.	a)	Describe the working principle of activated sludge process (ASP). How the wastewater is treated using ASP?	10
	b)	Describe the process of rotating biological contactor (RBC). Write the advantages of RBC.	8+2

