

NAGARJUNA COLLEGE OF ENGINEERING AND TECHNOLOGY

Department of Civil Engineering.

Even Semester 2023-24
Internal Assessment Test – I

Course Name: Waste Management	Course Code: 23ETC 25F	Semester: II
Date: 29/04/2024	Time: 1:00 PM to 2:00 PM	Max. Marks: 25

[Note: Answer any THREE full questions as indicated below]

Sl. No	QUESTIONS	COs	RBT Levels	Marks
1.	a) Explain the elements of waste management with a neat flow sheet.	CO2	L2	04M
	b) Calculate the number of vehicles required to collect waste from a house - house waste collection system having 1800 households and the waste will be collected every day using cycle driven vehicle with 2 crews. i) Number of pick up trips 2 ii) Length of working day is 7 hrs iii) off route time is 15% iv) Round trip haul distance 2.5 km/ trip v) At site time is 0.18 hrs/ trip vi) Number of containers/ location is 3 vii) Driving between containers (dbc) is 1 collector - minute/ location. Assume the suitable data required.	CO2	L3	06M
OR				
2.	a) With a neat sketch, explain the stationary collection system.	CO2	L2	04M
	b) From hauled container system, it is estimated that, the average time to drive from disposal site to first container and from the last container to the disposal site each day is 10 min and 20 min respectively. If dbc is 5 min and round trip haul distance is 30 Km, Find the number of trips per day by assuming length of working day as 7hrs.	CO2	L3	06M
3.	a) With a neat sketch, describe the importance of labelling of industrial hazardous waste.	CO2	L2	04M
	b) Design the components of sanitary landfill, from the following data i) Population = 50,000 ii) Quantity of waste produced = 2kg/ day iii) Density of solid waste in landfill = 475 kg/ m ³ iv) Depth of compacted solid waste = 5m.P	CO2, CO4	L3	06M
OR				
4.	a) Compare hazardous and non-hazardous industrial solid waste.	CO1	L2	04M
	b) Estimate the quantity of solid waste generation rate per annum and number of collectors required per day, for a municipal area having 50,000 houses. Assume each person produces 250 grms of solid waste per day and a collector collects 15kg of waste/ hr. The length of working day is 8hr/ day. Also assume 5 residents in each house.	CO2, CO4	L3	06M
5.	Compare aerobic and anaerobic composting methods.	CO4	L2	05M
OR				
6.	List and describe any two chemical treatment methods for hazardous industrial solid waste.	CO2, CO4	L1, L2	05M

NAGARJUNA COLLEGE OF ENGINEERING AND TECHNOLOGY

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Even Semester 2023-24
Internal Assessment Test – II

Course Name: Waste Management	Course Code: 23ETC 25F	Semester: 2 nd
Date: 14/06/2024	Time: 1:00 PM to 2:00 PM	Max. Marks: 25

[Note: Answer any THREE full questions as indicated below]

Sl. No	QUESTIONS		COs	RBT Levels	Marks
1.	a)	Define biomedical waste.	CO1, CO5	L1	02M
	b)	List and explain the different types of biomedical waste.	CO1	L2	08M
OR					
2.	a)	List the general wastes and other wastes from health care centers.	CO1	L1	02M
	b)	Describe the importance of record keeping in biomedical waste management.	CO2	L2	08M
3.	a)	Define radioactive waste and explain its different types.	CO1	L2	08M
	b)	Starting with 24 atoms of a sample, how many atoms will be left after 4 half-life period.	CO2	L3	02M
OR					
4.	a)	A sample of radioactive element containing 4×10^{16} active nuclei, half-life of the element is 10 days. Determine the number of decayed nuclei after 30 days.	CO2	L3	04M
	b)	Explain the segregation of radioactive waste depending on half-life period.	CO2, CO3	L2	06M
5.	Enumerate yellow and white categories of biomedical waste with examples.		CO2, CO5	L2	05M
OR					
6.	Radioactive substance has a mass of 800 grams and half-life of 12 years, calculate the decayed and undecayed mass of the substance after 48 years		CO2	L3	05M

Note: Answer any one full questions from each module

Module - 1

		COs	M	BL
1a	Describe the Bangalore method of composting solid waste.	CO2	06	L2
b	Calculate the number of vehicles required to collect waste from a house - house waste collection system having 1800 households and the waste will be collected every day using cycle driven vehicle with 2 crews. i) Number of pick up trips 2 ii) Length of working day is 7 hrs iii) off route time is 15% iv) Round trip haul distance 2.5 km/ trip v) At site time is 0.18 hrs/ trip vi) Number of containers/ location is 3 vii) Driving between containers (dbc) is 1 collector - minute/ location. Assume the suitable data required.	CO2	08	L3
c	With a neat sketch, explain the collection of solid waste by stationary container system.	CO4	06	L2

OR

2a	Explain the importance of 3T's in incineration process.	CO2 CO4	06	L2
b	From hauled container system, it is estimated that, the average time to drive from disposal site to first container and from the last container to the disposal site each day is 10 min and 20 min respectively. If dbc is 5 min and round trip haul distance is 30 Km, Find the number of trips per day by assuming length of working day as 7hrs.	CO2	08	L3
c	Describe the classification of waste depending on the physical state.	CO1	06	L2
3a	Explain the factors considered in selection of site for the storage of industrial hazardous waste.	CO2	08	L2
b	Design the components of sanitary landfill, from the following data i) Population = 30,000 ii) Quantity of waste produced = 5kg/ day iii) Density of solid waste in landfill = 675 kg/ m ³ iv) Depth of compacted solid waste = 3m.	CO2, CO4	08	L3
c	Describe shredding and pulverization of dry waste.	CO2	04	L2

OR

4a	Estimate the quantity of solid waste generation rate per annum and number of collectors required per day, for a municipal area having 30,000 houses. Assume each person produces 850 grms of solid waste per day and a collector collects 10 kg of waste/ hr. The length of working day is 8.5 hr/ day. Also assume 5 residents in each house.	CO2, CO4	08	L3
b	Explain the following with respect to incineration of solid waste i) Time ii) Temperature and iii) Turbulence.	CO2, CO4	06	L2
c	Describe the following i) Hazardous industrial solid waste ii) Nonhazardous industrial solid waste	CO1	06	L2

Module - 3

5a	Sketch the label used for radioactive waste and describe the packing of radioactive liquid waste.	CO2, CO4	06	L2
b	Describe the following i) Yellow category waste ii) White category waste iii) Red category iv) Blue category waste as per bio medical waste management rule 2016.	CO2	08	L2
c	List and explain the responsibilities of generators of biomedical waste.	CO2	06	L2

OR

- 6a Describe the treatment of different types of biomedical waste by CBWT. CO3, 10 L2
CO4
- b List the standards for autoclave and deep burial. CO3, 10 L2
CO4

Module - 4

- 7a Enumerate the effects of radiation on different parts of human body. CO4 10 L2
- b A sample of radioactive element containing 5×10^{16} active nuclei, half-life of the element is 12 days. Determine the number of decayed nuclei after 35 days. CO1 05 L3
- c Explain the following CO1 05 L2
i) Low level radioactive waste ii) High level radioactive waste.

OR

- 8a The initial mass of an isotope of iodine is 500 grams, determine the iodine mass after 50 days, if half-life is 10 days. CO1 05 L3
- b Calculate the half-life of the substance and quantity of decayed sample when a certain radioactive substance with initial mass of 50 kg decayed and remaining substance is 3 kg after a period of 50 minutes. CO1 05 L3
- c Describe the need for radioactive waste management along with a case study. CO1, 10 L2
CO4

Module - 5

- 9a List and explain the responsibilities of E – waste producers in E waste management. CO4 10 L2
- b Explain the effect of E – waste on human health. CO4 10 L2
- OR**
- 10a Enumerate on E – waste management rule 2016 and its importance in India. CO5 10 L2
- b List and Explain the 4R's technology in E – waste management. CO3 10 L2
