22BTP320AN

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2025
(Third Semester)

Branch - **BIOTECHNOLOGY**

MAJOR ELECTIVE COURSE – II : WASTE MANAGEMENT

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10 × 1 = 10)

Question No.	Question	K Level	CO
1	The composition of municipal solid waste mainly depends on: A) Water table B) Soil pH C) Population size and lifestyle D) Rainfall pattern	K1	CO1
2	The chemical properties of municipal solid waste are important because they: A) Influence potential for energy recovery and decomposition B) Only affect color and odor C) Are unrelated to disposal method D) Determine moisture content only	K2	CO1
3	Which of the following processes involves conversion of organic waste into methane and carbon dioxide under anaerobic conditions? A) Bioremediation B) Biomethanation C) Gasification D) Pyrolysis	K1	CO2
4	In nanoremediation, the use of nanosorbents and nanofilters primarily helps in: A) Increasing landfill space B) Enhancing the adsorption and filtration of contaminants C) Diluting pollutants with water D) Reducing the particle size of metals only	K2	CO2
5	Which of the following is not covered under solid waste management rules? A) Plastic waste B) Municipal solid waste C) Biomedical waste D) Radioactive waste	K1	CO3
6	The E-Waste Management Rules (2016) emphasize: A) Extended Producer Responsibility (EPR) B) dumping C) Open Burning of e-waste D) Export of e-waste	K2	CO3
7	The Air (Prevention and Control of Pollution) Act, 1981 aims to: A) Regulate Forest land use B) Protect groundwater C) Conserve biodiversity D) Prevent and control air pollution	K1	CO3
8	The Environment (Protection) Act, 1986 was enacted after: A) 1974 drought B) UN Rio Summit C) 1984 Bhopal gas tragedy D) Kyoto Protocol	K2	CO3
9	CSR refers to: A) Community Service Regulation B) Corporate Social Responsibility C) Central Social Reform D) Company Sustainability Rule	K1	CO4
10	INGOs like WWF and Greenpeace work to: A) Develop fossil fuels B) Increase industrial production C) Address global environmental issues D) Promote deforestation	K2	CO4

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SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Question No.	Question	K Level	CO
11.a.	Explain the physical, chemical, and biological properties of municipal solid waste and describe how they influence handling and disposal.	K2	CO1
	(OR)		
11.b.	Describe the methods used to measure solid waste generation and explain the major factors affecting the rate of solid waste generation in cities.	K2	CO1
12.a.	Explain the various biological treatment methods of solid waste such as composting, bioremediation, biomethanation, and production of biofuels.	K3	CO2
	(OR)		
12.b.	Describe the thermal treatment processes of solid waste including incineration, pyrolysis, and gasification and discuss their residues and potential for energy recovery.	K3	CO2
13.a.	Explain the sources and characteristics of hazardous and biomedical waste and how they influence management practices.	K3	CO3
	(OR)		
13.b.	Describe the modes and regulations for transportation of hazardous and biomedical wastes.	K3	CO3
14.a.	Define E-waste and explain its types and associated environmental hazards.	K4	CO3
	(OR)		
14.b.	Write short notes on the major Indian waste management rules (E-Waste, Hazardous, Plastic).	K4	CO3
15.a.	Explain the importance of CSR in promoting environmental sustainability.	K4	CO4
	(OR)		
15.b.	Explain the key provisions of the following environmental rules: Bio-Medical Waste Rules, 1998 & Recycled Plastics Manufacture and Usage Rules, 1999.	K4	CO4

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Question No.	Question	K Level	CO
16	Discuss the transformation processes of municipal solid waste—physical, chemical, and biological—and analyze how understanding these processes helps in planning effective treatment, recycling, and energy-recovery systems.	K4	CO1
17	Analyze how SCADA systems contribute to efficient monitoring and automation in waste management processes.	K4	CO2
18	Explain how proper handling of biomedical waste, segregation, compatibility, and recycling can prevent environmental and health impacts.	K4	CO3
19	Discuss the dangers and disposal methods of e-waste and analyze how legal frameworks like the E-Waste Management Rules (2016) promote sustainable practices.	K4	CO3
20	Discuss the major environmental legislations in India, including the Water Act (1974), Air Act (1981), and Environment (Protection) Act (1986).	K4	CO4

Z-Z-Z END