

Total No. of Questions: 6

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Enrollment No.....



Faculty of Engineering  
End Sem (Even) Examination May-2022  
ME3EE07 Bio & Solid Waste Management  
Programme: B.Tech. Branch/Specialisation: ME

Duration: 3 Hrs.

Maximum Marks: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

- Q.1 i. Minister of State for Environment, Forest & Climate Change (India): 1  
(a) Jairam Ramesh (b) Babul Supriyo  
(c) Prakash Javadekar (d) Mahesh Sharma
- ii. Which of the below is not an idea behind solid waste management? 1  
(a) Control of waste generation  
(b) Storage and collection  
(c) Disposal  
(d) Stop waste generation
- iii. According to SWM Rules, 2016, Dry waste is stored in: 1  
(a) Green Bin (b) Blue Bin (c) Red Bin (d) None of these
- iv. According to Swachh Survekshan 2019, Indore named 'cleanest city' for third year in a row. The second and third positions in the category were grabbed by Ambikapur in Chhattisgarh and \_\_\_\_\_ in Karnataka. 1  
(a) Mangalore (b) Bengaluru (c) Udupi (d) None of these
- v. A mixture of hydrogen and carbon monoxide (with possibility of having carbon dioxide content sometimes) produced during gasification is known as: 1  
(a) Syn Gas (b) Producer Gas  
(c) Both (a) and (b) (d) None of these
- vi. \_\_\_\_\_ is also known as destructive distillation/carbonization. 1  
(a) Incineration (b) Pyrolysis  
(c) Gasification (d) None of these

P.T.O.

[2]

- vii. According to SWM rules 2016, the concentration of methane gas generated at landfill site shall not exceed \_\_\_\_ per cent of the lower explosive limit. **1**  
 (a) 30 (b) 25 (c) 20 (d) 55
- viii. \_\_\_\_ is a liquid that passes through solid waste and extract suspended impurities from it. **1**  
 (a) Leachate (b) Sludge  
 (c) Distilled water (d) Municipal waste
- ix. Best management practices (BMPs) is a term used in \_\_\_\_ and \_\_\_\_ to describe management practices of preventing or reducing the pollution of waters. **1**  
 (a) United States and Canada (b) India and China  
 (c) Japan and Korea (d) None of these
- x. PPP Stands for: **1**  
 (a) Private-private partnership  
 (b) Private-public partnership  
 (c) Public-private partnership  
 (d) None of these
- Q.2 i. Define: **2**  
 (a) Waste (b) Solid Waste Management
- ii. Write any three problems associated with SWM in India. **3**
- iii. Write any five duties/responsibilities of waste generator(s) according to SWM Rules, 2016. **5**
- OR iv. Write any five duties/responsibilities of local authorities in regard of collection/transportation of solid waste. **5**
- Q.3 i. Provide physical composition of MSW in India in the form of a pie-chart. **2**
- ii. Explain any eight properties or characterisation of solid waste. **8**
- OR iii. Define Segregation according to SWM Rules, 2016. Give the classification of waste segregated (BASIC SEGREGATION) containing the list of wastes in tabulated form. **8**

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- Q.4 i. Define: **3**  
 (a) Refuse Derived Fuel (b) Recycling  
 (c) Composting
- ii. Write down the five typical reactions which takes place during gasification. Give any two differences between incineration and pyrolysis. **7**
- OR iii. Explain three stages involved in biogas formation from organic fraction of SW with a neat block diagram. Also mention any three advantages of anaerobic digestion. **7**
- Q.5 i. Write any four impacts of open dumping of solid waste. **4**
- ii. Draw a neat diagram of landfill. Explain the functions of cell, leachate collection system, liner and gas collection system of landfill. **6**
- OR iii. Explain any six site selection considerations for landfill. **6**
- Q.6 Attempt any two: **5**
- i. "Waste is a resource". Explain it by taking example of any two Indian start-ups/companies which are converting trash into cash. **5**
- ii. Explain power generation by MSW incineration plant with suitable diagram. **5**
- iii. List any five advantages of using demolition waste and plastic waste in construction. **5**

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### Marking Scheme - ME3EE07 Bio & Solid Waste Management

Q.1	i.	Minister of State for Environment, Forest & Climate Change (India):	1
		(b) Babul Supriyo	
	ii.	Which of the below is not an idea behind solid waste management?	1
		(d) Stop waste generation	
	iii.	According to SWM Rules, 2016, Dry waste is stored in:	1
		(b) Blue Bin	
	iv.	According to Swachh Survekshan 2019, Indore named 'cleanest city' for third year in a row. The second and third positions in the category were grabbed by Ambikapur in Chhattisgarh and _____ in Karnataka.	1
		(d) None of these	
	v.	A mixture of hydrogen and carbon monoxide (with possibility of having carbon dioxide content sometimes) produced during gasification is known as:	1
		(a) Syn Gas	
	vi.	_____ is also known as destructive distillation/carbonization.	1
		(b) Pyrolysis	
	vii.	According to SWM rules 2016, the concentration of methane gas generated at landfill site shall not exceed ____ per cent of the lower explosive limit.	1
		(b) 25	
	viii.	_____ is a liquid that passes through solid waste and extract suspended impurities from it.	1
		(a) Leachate	
	ix.	Best management practices (BMPs) is a term used in ____ and ____ to describe management practices of preventing or reducing the pollution of waters.	1
		(a) United States and Canada	
	x.	PPP Stands for:	1
		(c) Public-private partnership	

Q.2	i.	Define:	2
		(a) Waste	1 mark
		(b) Solid Waste Management	1 mark
	ii.	Any three problems	3
		1 mark each	(1*3) marks

	iii.	Any five duties/responsibilities	1 mark each	(1*5) marks	5
OR	iv.	Any five duties/responsibilities	1 mark each	(1*5) marks	5
Q.3	i.	Pie-chart with % of physical composition	2 marks		2
	ii.	Any eight properties or characterisation	(1*8) marks		8
OR	iii.	Define Segregation	2 marks		8
		Any three classification with list	(2*3) marks		
Q.4	i.	Define:			3
		(a) Refuse Derived Fuel	1 mark		
		(b) Recycling	1 mark		
		(c) Composting	1 mark		
	ii.	Any five typical reactions	1 mark each	(1*5) marks	7
		Any two differences	1 mark each	(1*2) marks	
OR	iii.	Explain three stages involved	1 mark each	(1*3) marks	7
		Neat block diagram	1 mark		
		Any three advantages	1 mark each	(1*3) marks	
Q.5	i.	Any four impacts,	1 mark each	(1*4) marks	4
	ii.	Draw a neat diagram of landfill	2 marks		6
		Functions of cell	1 mark		
		Leachate collection system	1 mark		
		Liner	1 mark		
		Gas collection system of landfill	1 mark		
OR	iii.	Any six site selection,	1 mark each	(1*6) marks	6
Q.6		Attempt any two:			
	i.	Description of any two Indian start-ups	(2.5*2) marks		5
	ii.	Explain power generation by MSW	3 marks		5
		Suitable diagram	2 marks		
	iii.	Any five advantages,	1 mark each	(1*5) marks	5

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