

CVL 721 Solid Waste Engineering

Major Exam

Total Marks = 40

Time: 1 Hr 30 Mins

Please read these instructions before you start answering:

This is an open book / open PPT examination. But no downloading / copying from internet allowed. Also, no exchange of documents, answers and no discussions.

If there is any assumption to be made, indicate that it in your answer script.

There is negative marking for irrational / illogical statements/answers. This is not for wrong answers. Maximum of -2 per question.

Kindly stop writing at 11.30 AM (after 1 hr 30 mins), scan your answer script, and email to alappat@iitd.ac.in as a single PDF doc once. Kindly use your name and Roll number as the file name.

All these operations must be over well before 12.00 noon. No answer scripts will be accepted after that.

1. Explain the use and operation of bioreactor landfills for MSW based on the Solid Waste Management Rules of 2016. No sketch required. **(5 Marks)**
2. The characteristics of leachate that is generated from a sanitary landfill will change considerably over the years. Discuss the treatment strategy for leachate generated from sanitary landfills across the life (age) of the landfill. **(5 Marks)**
3. a. Based on the notification on the Fly Ash utilization from Thermal Power Plants (1999; final amendment in 2016), discuss: The use of fly ash for the manufacture of bricks, and other construction activities. **(2.5 Marks)**
b. Compare the properties of Fly-ash-mixed cement concrete with the concrete made from OPC (Ordinary Portland Cement). **(2.5 Marks)**
4. Why the original hazardous waste management rules in India (implemented in 1989) were required to be amended / modified quickly ? Discuss the major amendments. **(5 Marks)**

5. Briefly explain the philosophy behind the recommendation: clubbing gasification and incineration for dealing with biomedical waste using the existing double chambered fixed hearth incineration facility. How can that be actually implemented. **(5 Marks)**

6. Waste plastic materials are being collected in many municipalities. What can be done with these waste plastics ? **(5 Marks)**

7. What do you understand by EPR in the management of e-waste ? How can it be actually implemented in your opinion ? **(5 Marks)**

8. With respect to Bio-medical Waste Management Rules, 2016: An autoclave operated at a temperature of 121°C at 15 psi pressure requires at least 60 minutes of residence time for complete destruction of the microorganisms. What are the different ways to improve the efficiency of this autoclave system ? **(5 Marks)**
