

Exam Date & Time: 21-May-2022 (10:00 AM - 01:00 PM)



VI Semester End Semester Examination
SOLID AND HAZARDOUS WASTE MANAGEMENT (CHE 4058)
SOLID AND HAZARDOUS WASTE MANAGEMENT [CHE 4058]

Marks: 50

Duration: 180 mins.

Descriptive Questions

Answer all the questions.

Section Duration: 180 mins

- 1) Explain about the designs of larger transfer stations. Also mention the advantages and disadvantages of each design. (5)
 - A)
 - B) Write a short note on any four thermal disposal options available for solid wastes. (2)
 - C) Classify the following wastes based on its type and source: (3)
 - (i) Boiler house cinders (ii) Coarse screening grit (iii) Pathological wastes
- 2) The leachate from a municipal landfill has the following characteristics:
COD: 575 kg; BOD: 369 kg; Suspended solids: 125 kg; Cr^{6+} : 6 kg, $\text{NH}_4\text{-N}$: 760 mg/L
 - A) Discuss about the physico-chemical and biological treatment methods which can be used for the treatment of leachate with the above said properties. (4)
 - B) What is the composition of landfill gas? Explain the variation in the composition of landfill gas during the four phases of bacterial decomposition. (4)
 - C) What is the significance of calorific values in solid waste management systems? Compare the calorific value of lipids, wood and paper with cooking oil. (2)
- 3) The residents of a community have segregated recyclable and non-recyclable wastes at source. Non-recyclable organic wastes are sent to composting facility. Design of a model material recovery and processing facility with a neat flowsheet to segregate different types of recyclable materials to be sent to a recycling facility. (5)
 - A)
 - B) Write a short note on any four characteristics of hazardous wastes. (2)
 - C) Explain the working of hammer mills with a neat sketch. (3)
- 4) Write a short note on two-stage anaerobic digesters with a neat sketch. (4)

- A)
- B) Discuss about influence of any four chemical parameters on composting process. (4)
- C) Mention any four advantages of in-vessel composting over open-air composting system. (2)
- 5) A community produces 600 tons of combustible solid wastes per day which is to be incinerated for energy recovery. Also explain the appropriate incineration technology with a neat sketch. (5)
 - A)
 - B) Write a short note on precautionary labelling for transportation of hazardous wastes. Also, make a precautionary labelling for the transportation of diesel fuel. (3)
 - C) Discuss about any four disposal options for hazardous wastes. (2)

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