7. (a) 50dB(A) noise lasting for 55 minutes is followed by 90dB(A) noise lasting for 5 minutes . What is the L_{eq} of this noise?

(b) What is photochemical Smog? Describe the causes of photochemical Smog with the help of chemical reactions involve.

5+7 = 12

Group – E

8. (a) Write a short note on The Air (Prevention and Control Pollution) Act, 1981.

(b) Discuss in details the methods of land filling?

6 + 6 =12

9. (a) A contractor agreed to haul the solid waste from an industrial district of a city. The industries agreed to store their waste on large containers located at strategic points. Due to the sizes of the containers, the hauled-container system of collection is to be used. Based on a traffic study, t_1, t_2 and d_l were found to be 20, 25 and 8 minutes, respectively. If the round trip haul distance averaged 60 km at a speed limit 55 mph, how many containers can be serviced on a collection day of 8h?

(b) Describe the different methods for solid waste processing.

5 + 7 = 12

ENVIRONMENTAL POLLUTION & CONTROL
(CIVL 4163)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) Non-biodegradable pollutants are created by
(a) Nature (b) Excessive use of resources
(c) Humans (d) Natural disaster.

(ii) SO_2 and CO adversely affect
(a) Oxygen carrying capacity of blood and functioning of lungs, respectively
(b) Functioning of the respiratory system and brain, respectively
(c) Functioning of the respiratory system and oxygen carrying capacity of blood, respectively
(d) Functioning of air passages and chest respectively.

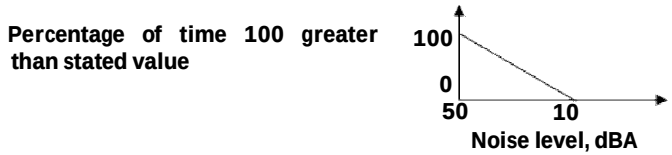
(iii) During temperature inversion in atmosphere, air pollutants tend to:
(a) Accumulate above inversion layer
(b) Accumulate below inversion layer
(c) Disperse laterally
(d) Disperse vertically.

(iv) The device which can be used to control gaseous as well as particulate pollutants in the industrial emissions is known as:
(a) Cyclone separator (b) Spray tower
(c) Dynamic precipitator (d) Fabric filters.

(v) Vanadium pentoxide is used as a catalyst to treat:
(a) Sulphur dioxide in exhausts (b) Carbon monoxide in exhausts
(c) Arsenic in water (d) Chromium in wastewater.

(vi) The material generally used for sound proofing of rooms like a recording studio and auditorium is?
(a) Cotton (b) Coir
(c) Wood (d) Styrofoam.

(vii) The cumulative noise power distribution curve at a certain location is given below .



The value of L40 is equal to
(a) 90 dBA (b) 70 dBA (c) 80 dBA (d) 60 dBA.

(viii) The Water Act was amended in the year
(a) 1987 (b) 1981 (c) 1988 (d) 1980.

(ix) The average composition of Municipal solid waste is:
(a) 41% organic, 40% inert & 19% recyclable
(b) 20% organic, 60% inert & 20% recyclable
(c) 30% organic, 20% inert & 50% recyclable
(d) 19% organic, 41% inert & 40% recyclable.

(x) Which one of the following solid waste disposal methods is ecologically most acceptable?
(a) Sanitary Landfill (b) Incineration
(c) Composting (d) Pyrolysis.

Group – B

2. (a) Define air pollution, and differentiate between primary and secondary pollutants with example.

(b) Illustrate the formation of any two secondary pollutants. What is double inversion?

4+ 4 + 4 =12

3. (a) A factory uses 1.5 Ml of fuel oil per month. The exhaust gases from the factory contain the following quantities of pollutants per ML per year:
(i) Particulate Matter = 4t/year
(ii) SO_2 = 20t/year
(iii) NO_x = 5t/year
(iv) HC, CO and others= 3t/year
Determine the safe height of chimney required for safe dispersion of the pollutants.

(b) Define effective height of a stack.

(c) Enlist the natural self-cleansing method of air pollutant removal from the atmosphere.

6+ 2 + 4 = 12

Group – C

4. Describe any three equipment in detail used for control of particulate pollutants.

(3× 4 = 12)

5 Discuss in detail about the suggested treatment for the following industries:
(i) Dairy Industry (Milk processing industries)
(ii) Petro Chemical Industries

6 + 6 =12

Group – D

6. (a) What is noise? Differentiate between L_{eq} and L_n in relation to expression of sound levels.

(b) While recording A-weighted sound levels, 4 readings have been taken at a site at different times of a day. These readings are: 30, 55, 72 and 61dB(A)re : 20mPa. What is the average sound level?

5 + 7 = 12