ENVIRONMENTAL POLLUTION & CONTROL
(CIVL 4163)

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

Figures out of the right margin indicate full marks.
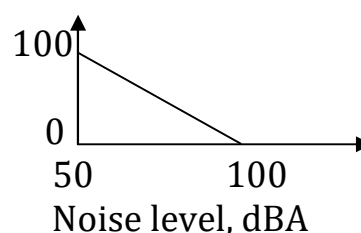
Candidates are required to answer Group A and
<u>any 5 (five)</u> from Group B to E, taking <u>at least one</u> from each group.

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)   Acid rains are caused by the following pollutants
   (a) SO_2 and O_3 (b) SO_2 and NO_X
   (c) NO_X and O_3 (d) CO and SO_2.

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

   (iii)   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.

   (iv)   When was the Water (Prevention and Control of Pollution) Act enacted by the Indian parliament?
   (a) 1970   (b) 1974   (c) 1980   (d) 1985.

   (v)   Which of the following parameters is not included in the routine characterization of solid waste for its physical composition?
   (a) Moisture content   (b) Density
   (c) Particulate size analysis   (d) Energy value.

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

   Percentage of time greater than stated value

   100 ⌐
   |
   |
   0 └_____→
   50   100
   Noise level, dBA

   The value of L_{40} is equal to
   (a) 90 dBA   (b) 70 dBA   (c) 80 dBA   (d) 60 dBA.

(vii) The average consumption of air by an adult human being is of the order of
(a) 5kg   (b) 12kg   (c) 25kg   (d) 32kg.

(viii) *Leachate* is a coloured liquid, that comes out from:
(a) Septic tank   (b) Sanitary landfill
(c) Compost plants   (d) Aerated lagoons.

(ix) Pyrolysis is a process in
(a) Water Treatment   (b) Solid Waste Management
(c) Vehicular Air Pollution   (d) Industrial Waste Treatment.

(x) Silicosis is caused in the
(a) Textile industries   (b) Sugar industries
(c) Storage battery industries   (d) Stone crushers.

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) What do you mean by secondary pollutants? Explain the formation of photochemical smog.

(b) What do you mean by the effective height of a chimney? During rush hour on a busy road crossing, nearly 1200 vehicles ply per hour at an average speed of 20kmph. Of these about 70% cars use leaded petrol. The average fuel consumption is one litre for an average of 8km of travel. Considering that 70% of the lead present in the fuel is emitted in the form of particulate aerosol. Find the emission rate of lead aerosol in the ambient air. (Given concentration of lead in the fuel 0.4µg/L).

5 + (2 + 5) = 12

Group – C

4. Write short notes on any three of the following (Mention the merits, demerits and the principle with neat sketches):
(i) Electrostatic precipitators.
(ii) Venturi-scrubbers
(iii) Cyclone collectors.
(iv) Gravitational settling chambers.

(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: 40, 56, 702 and 68 dB(A)re : 30mPa. What is the average sound level?

   5 + 7 = 12

7. (a) Write a short note on Global warming.

   (b) Traffic noise data are given below in the table. Compute L_{eq}

Time (s)	10	20	30	40	50	60	70	80	90	100
Noise (dBA)	70	80	79	69	86	76	74	81	75	74

   4 + 8 = 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) Explain the different methods of solid waste collection along with their sketches.

   (b) Define leachate. Draw the graph showing the different phases of landfill.

   6 + 6 = 12

Department & Section	Submission link:
CE A	https://classroom.google.com/w/MjQxMDU4NTcxNzQ1/tc/Mjc0NjYyNjQ5OTE1
CE B	https://classroom.google.com/c/Mjc0NTY2MDU4OTQ4/a/Mjc0NzEwODMzNzM3/details