Full Marks: 30

Indian Institute of Technology Kharagpur

CLASS TEST-1

Date: 07-09-2021

Sub: IPC

Answer all the questions

TIME: 30 MINS

(Open Book, Open Note examination. Assume suitable data whenever necessary with justification)

Upload neat and clean hand-written answer script only in A-4 size

1.
   I) Explain types and mechanism of inversion with example

   I)   Define primary and secondary pollutants with example.

   [5 + 5]

2. A coal-fired power plant burns 80,000 tones of coal per day and an ESP is used to collect the fly-ash from power plant with an working efficiency of 99.25%. The coal has a sulfur content 0.5 % and total amount of fly ash generated is 4 kg /ton of coal burnt . The physical stack height is 275 m and inside diameter of 3.5 m with a stack gas velocity of 7 m/s. The stack gas leaves at 140 $^\circ$C. The ambient temperature 25 $^\circ$C. and barometric pressure of 930 milibars. A neutral plume is found at the exit of the chimney. The wind velocity measured at 6 meter height from the ground and the average wind velocity recorded as 2.8 m/s . The values of exponent p for various stability classes is given below.

Stability Class	A	B	C	D	E	F
Rural	0.07	0.08	0.10	0.15	0.35	0.55
Urban	0.15	0.17	0.20	0.25	0.30	0.35

Calculate:
- i) Effective stack height
- ii) The maximum concentration of fly-ash and how far is this form from the plant. Is it acceptable as per NAAQS?

[20]