PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

MAKE UP EXAMINATION – JAN 2023

Course Code : CIV 330

Course Name : Urban air pollution and control

Program: B.Tech (Civil Engineering)

Date: 24/01/2023

Time: 09.30AM to 12.30PM

Max Marks: 100

Weightage: 50%

Instructions:

(i) ***Read the question carefully and answer all the questions.***

(ii) ***Question paper consists of 3 parts.***

(iii) ***Scientific and Non-programmable calculators are permitted.***

Part A [Memory Recall Questions]

Answer all the Questions. Each Question carries six marks.   **(5Qx6M=30)**

1) The primary factor which controls gas absorption by the leaves is the degree of the opening of the stomata. When stomata are wide open absorption is maximum & vice versa. Predict the different forms of damage caused by air pollution to plants.   (C.O.NO.1) [Knowledge]

2) Plume refers to the path and extent in the atmosphere of the gaseous effluents released from a source, usually a stack. Based on meteorological conditions the plume exhibits different behavior. List the different behavior of plume.   (C.O.NO.2) [Knowledge]

3) The direction & speed of surface winds govern the drift & diffusion of air pollutants discharged into air. The precipitation has cleansing action. Recognize the concentration of air pollution based on above parameters.   (C.O.NO.2) [Knowledge]

4) The rate of change in temperature observed while moving upward through the Earth's atmosphere. In relation to this what is Lapse rate and Inversion?   (C.O.NO.2) [Knowledge]

5) Meteorology is the study of the atmosphere, atmospheric phenomena, and atmospheric effects on our weather. List the various Meteorological parameters influencing the air pollution.

(C.O.NO.2) [Knowledge]

Part B [Thought Provoking Questions]

Answer all the Questions. Each Question carries ten marks. **(5Qx10M=50)**

6) Poor air quality has harmful effects on human health, particularly the respiratory and cardiovascular systems. Pollutants can also damage plants and buildings, and smoke or haze can reduce visibility. Discuss how zoning and use of tall Stacks helps in controlling air pollution.

(C.O.NO.3)[Comprehension]

7) The pollutant discharged at source must be reduced by use of controlling equipment's. Many equipment's are available for controlling Particulate Matter. Explain the equipment which uses gravitation force to separate dust particles from gas. (C.O.NO.3) [Comprehension]

8) A cyclone is a centrifugal separator in which particles, due to their mass, are pushed to the outer edges as a result of centrifugal force. Draw Cyclone Separator. (C.O.NO.3) [Comprehension]

9) Gravity settling chambers are the oldest and simplest means of removing large diameter suspended particles from a gas. High-efficiency settling chambers are often fitted with baffles or deflectors to change the gas flow direction. Summarize its advantages and disadvantages in controlling air pollution. (C.O.NO.3) [Comprehension]

10) Wet Scrubbers are effective air pollution control devices for removing particles and/or gases from industrial exhaust streams. Distinguish any two wet scrubber. (C.O.NO.3) [Comprehension]

Part C [Problem Solving Questions]

Answer the Question. The Question carries twenty marks. **(1Qx20M=20)**

11) Inertial separators concentrate or collect particles by changing the direction of motion of the flowing gas, in such a way that the particle trajectories cross over the gas steam lines and the particles are either concentrated into a small part of the gas flow or are separated by impingement onto a surface. Illustrate baffle, dust trap and louver separators.

[20m](C.O.NO.3) [Application]