

**M. E. Civil Engineering First Year First Semester Examination 2025**

**Environmental Pollution & Management**

Time: Three Hours

Full Marks: 100

Use separate Answer-Scripts for each part

**Part-1 (60 Marks)**

**Answer Question No. 1 & 2 and any Two from the rest.**

1. Answer in one or two words:

- a) What is the common reason of inclusion of two organic air pollutants in the National Ambient Air Quality Standards (NAAQS) list as criteria air pollutants (CAP)?
- b) What does the subscript in PM<sub>10</sub> and PM<sub>2.5</sub> represent?
- c) Mention the threshold pH of unpolluted rain water.
- d) Name two CAPs which should be minimized to control air pollution due to secondary particulate.
- e) Mention two particulate CAPs, which dictate AQI of India.
- f) What is the wavelength range of the UV ray which can reach to earth during ozone depletion?
- g) Name two gaseous CAPs which may be measured by high volume samplers along with particulates.
- h) *When* was suspended particulate matter (SPM) excluded from NAAQS?
- i) Name the PAH with five benzene rings only.
- j) What is the anhydride of sulfurous acid? 1X10=10

[ Turn over

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2. Answer very briefly

- a) Why waste treatment may not be sufficient to achieve the goal of sustainable development?
- b) Why is CO regarded as a CAP?
- c) Mention different mathematical units used to express the threshold concentrations of CAPs as mentioned in NAAQS table.
- d) Write the equation for formation of the CAP which is precursor for the formation of main photochemical oxidant.
- e) Why pulverization and subsequent washing of coal cannot minimize SO<sub>2</sub> completely?
- f) Why change of process is only practical option for minimization of NO<sub>x</sub>, before its generation?
- g) Why indoor air quality standard should not be same as ambient air quality standard?
- h) Mention two basic differences between a Halon and a CFC?
- i) 'Photochemical smog is also called \_\_\_\_\_ smog', mention two different words to fill up.
- j) Draw a sketch to define mixing depth. 2X10=20

3.
  - a) Draw the combined absorption spectra of the atmosphere and define natural and man-made Greenhouse Effect from the spectra drawn.
  - b) Write the chemical formula of the following compounds: (i) HCFC-31 (ii) H-2311 (iii) CFC-113
  - c) Write code number of the following compounds: (i) CH<sub>2</sub>F<sub>4</sub> (ii) CFCL<sub>2</sub>CH<sub>3</sub> 10+3+2=15

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4. a) What is classical smog? Mention two CAPs related with this type of smog. Comment about their combined effect on respiratory system of human beings.
- b) Write the following equations of the reaction describing
- (i) the effect of Acid Rain on marbles
  - (ii) formation of bicarbonate acidity in rain water.
  - (iii) natural destruction of tropospheric ozone
  - (iv) formation of stratospheric ozone
- 7+8=15**
5. a) Compare stable and absolutely stable condition with the help of a sketch. What is the environmental lapse rate during neutral stability condition?
- b) Name and draw the plume patterns during following conditions:
- (i) ground level inversion below the stack height
  - (ii) ground level inversion above the stack height
  - (iii) ground level inversion below the stack height and an elevated inversion
  - (iv) stable calm condition
- 5+10=15**