

MA./M.Sc. GEOGRAPHY
SECOND SEMESTER
AIR POLLUTION & CONTROL
MOOCS
[USE OMR SHEET]

Duration: 1.30 hrs.

Full Marks: 35

Choose the correct answer from the following:

1X35=35

1. Photochemical smog comes under which of air pollution?
a. Micro scale
b. Meso scale
c. Macro scale
d. Global scale
2. As a preservative coating on the building surface, materials used like acrylic copolymers and siloxanes because of their _____ film forming properties.
a. Good adhesion
b. Good cohesion
c. Weak cohesion
d. Weak adhesion
3. Which part of plant plays a role in the reactions of pollutants in an indirect way?
a. Stem of the plant
b. Water film present on cuticle
c. Roots of the plant
d. Leaf of the plant
4. How are film drops formed in the context of aerosol production from bursting bubbles?
a. By shattering the thick lower surface of the bubble
b. By shattering the thin upper surface of the bubble
c. By direct emission from ocean surfaces
d. By condensation of water vapor
5. Which one of the following weather patterns is responsible for the Sunny and calm weather with poor dispersion of air?
a. Anticyclones
b. Cyclone
c. El Nino
d. La Nina
6. How does the heat released by condensation affect the wet adiabatic lapse rate?
a. It has no effect
b. It intensifies adiabatic cooling
c. It mitigates adiabatic cooling, resulting in warmer air
d. It causes air parcel to become completely saturated
7. Which method is used in sampling and analysis of PM_{2.5} in ambient air?
a. Gravimetric method
b. Improved West and Gaeke method
c. Modified Jacob and Hochheiser method
d. UV photometric
8. Which of the following pollutants is NOT measured using the MultiGas Monitor?
a. Carbon Monoxide (CO)
b. Carbon Dioxide (CO₂)
c. Particulate Matter (PM₁₀)
d. Volatile Organic Compounds (VOC_s)
9. The maximum time interval for monitoring of the particulate matter using the spectrometer software is:

- a. 60 minutes
c. 15 minutes
- b. 30 minutes
d. 10 minutes
10. The principle of the method involved in the measurement of particulate matter in a spectrometer is:
a. Scattering of light
c. Chemical method
- b. Gravimeter
d. UV photometric
11. Which type of samples are used for long term monitoring of NO₂ for exposure assessment?
a. Badge type
c. Questionnaire
- b. Tube type
d. Biomarker
12. Which of the following pollutants concentration is expressed in Becquerels per cubic meter (Bq/m³)
a. NO₂
c. Formaldehyde
- b. VOCs
d. Radon
13. In the case study related to Personal Exposure to Fine Particles, the expression for calculating the exposure to PM_{2.5} is given as:
a. Exposure = Concentration x Time
c. Exposure = (Concentration)^{Time}
- b. Exposure = $\frac{\text{Concentration}}{\text{Time}}$
d. Exposure = Ln (Concentration/Time)
14. Which of the following plume exists under the neutral lapse rate when wind speed is greater than 32 km per hour?
a. Looping
c. Coning
- b. Fanning
d. Lofting
15. When does eclipsing occur in the context of air pollution indices?
a. When pollution is over estimated
c. When pollution is underestimated
- b. When concentrations of pollutants are within acceptable limits
d. When historical data is missing
16. In the case study related to Indoor Air Quality in Nursery Buildings, UAE, match the pollutant (List-I) with their corresponding measuring equipment (List-II) used in the study:

List - I Pollutant	List -II Measuring equipment
P. Total Volatile Organic Compounds (TVOC)	1. Indoor Air Quality meter
Q. Carbon Dioxide	2. Air metrics Mini Tool Portable sampler
R. Total Suspended Particles (TSP)	3. VOC Environmental Meter

- a. P-3, Q-1, R-2
c. P-2, Q-1, R-3
- b. P-3, Q-2, R-1
d. P-1, Q-2, R-3
17. The urban centre that is warmer than the surrounding less populated area is called as
a. Cold island
c. Heat island
- b. Global warming potential
d. Climate change

18. When the acidic particles and gases get deposited from the atmosphere in the absence of moisture, it is termed as _____
- Wet deposition
 - Dry deposition
 - Alkalinity
 - Emission
19. What pollutants are associated with non-exhaust emissions from vehicles?
- PM₁₀, PM_{2.5}, and heavy metals
 - Carbon monoxide (CO)
 - Hydrocarbons (HC)
 - Nitrogen oxides (NO₂)
20. What modes of operation are available for the GAINS (Greenhouse Gas and Air Pollution Interactions and Synergies) model ?
- Only in "optimization" mode
 - Only in "scenario analysis" mode
 - Only in "simulation" mode
 - In both "scenario analysis" and "optimization" modes
21. Aerosol Optical Depth expresses the quantity of light removed from a beam by _____ aerosols during its path through the atmosphere.
- Dispersion
 - Diffusion
 - Scattering
 - Absorption
22. An electrostatic precipitator, in which the collection plate area is 120 m², collection efficiency is 99.94%, and the migration velocity is 0.25 m/s, will have the gas flow rate _____
- 1.5 m³/s
 - 4 m³/s
 - 6.7 m³/s
 - 13 m³/s
23. Which of the following pollutants was added to revised National Ambient Air Quality Standards (NAAQS) of India in 2009?
- Lead
 - Carbon dioxide
 - Ozone
 - Ammonia
24. According to the Ringelmann chart method, a visual assessment method for smoke emissions, if the Ringelmann number is 4, it represents:
- 20% opacity - barely visible smoke
 - 40% opacity - clearly visible smoke
 - 60% opacity - somewhat transparent smoke
 - 80% opacity - barely transparent smoke
25. Which of the following plans aims to achieve national fuel security by promoting hybrid and electric vehicles in the country
- National Electric Mobility Mission Plan
 - National Clean Air Programme
 - National air quality index
 - None of these
26. What is assumed in the Gaussian Plume Model regarding the time required for pollutants to travel to the receptor?
- Wind speed variations
 - Molecular Diffusion
 - Buoyancy effects
 - Steady state
27. The basic equation for emission estimation is _____
- Emission = Emission factor - Activity Data
 - Emission = Emission factor + Activity Data

- c. Emission = Emission factor x Activity Data
 d. Emission = Emission factor/Activity Data

28. As per the given case study on the impact of Lockdown on Air Quality, which of the following pollutants increased after imposing the lockdown in Sao Paulo, Brazil?
 a. CO
 b. NO
 c. NO₂
 d. O₃
29. Match the List -I and List -II based on the AVOID-SHIFT-IMPROVE approach

List-I Approach	List-II Strategy
P. IMPROVE	1. Prioritize public/non-motorized modes over private/motorized modes.
Q. AVOID	2. Reduces travel demands
R. SHIFT	3. Enhances quality of fuels, technologies and strengthens the systems for pollution control.

- a. P-3, Q-2, R-1
 b. P-3, Q-1, R-2
 c. P-2, Q-1, R-3
 d. P-1, Q-2, R-3
30. Biochar is a finely divided, carbon-rich, porous substance that can be obtained from the crop stubble through the process of _____
 a. Composting
 b. Pyrolysis
 c. Mechanical processing
 d. Happy seeder
31. In sampling of PM₁₀ using High volume sampler, what is the cut point diameter of inlet where particles are collected by the filter paper.
 a. 0.1µm
 b. 1µm
 c. 10 µm
 d. 100 µm
32. How is wind direction analysis typically represented in model performance validation?
 a. Scatter plot with time trends
 b. Polar scatter plot
 c. Distribution of residuals
 d. Ratio analysis
33. Which activity is likely to increase the presence of butanal, a common VOC.
 a. Cooking with proper ventilation
 b. Burning candles and barbecues indoors
 c. Using water-based furniture polish
 d. Drinking bottled water
34. The type of force involved in physical absorption which are electrostatic in nature is called _____
 a. Chemical interaction
 b. Van der Waal force
 c. Centrifugal force
 d. No force is involved
35. Which of the following technique is adopted when the contaminated concentration is high enough to make a recovery feasible and economical.
 a. Biofiltration
 b. Oxidation
 c. Condensation
 d. Absorption

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