



Department of Mechanical Engineering

CE8005 AIR POLLUTION AND CONTROL ENGINEERING

Unit II -METEOROLOGY MCQ Bank

1. What does the word 'meteorology' define?

- a) Study of meteors and asteroids
- b) Study of measurements and instruments
- c) Study of chemical properties of metals
- d) Study of the weather and atmospheric changes**

Answer: d

Explanation: Meteorological information is necessary predict and plan the control of air pollution.

2. What is a "tetron" in the field of meteorology?

- a) A tool used to study wind patterns**
- b) A tool used to study pressure variations
- c) A tool used to study temperature deviations
- d) A tool used to study humidity

Answer: a

Explanation: Tetron – Tetrahedral Balloon drifts horizontally along with the wind and is tracked by radar. It is used to analyse local wind patterns.

3. What does the Richardson number indicate in wind analysis?

- a) Mechanical turbulence
- b) Convective heat production
- c) Mechanical turbulence & Convective heat production**
- d) None of the mentioned

Answer: c

Explanation: Richardson number ($-Ri$) gives a relative rate of production of mechanical and convective energy.

4. Above which Richardson number does vertical mixing in winds disappear?

- a) 1
- b) 0.25**
- c) 0.5
- d) 0.75

Answer: b

Explanation: Beyond Richardson number of 0.25, the vertical mixing comes to a standstill and weak horizontal eddies alone remain.

5. When Richardson number is equal to zero, what is the wind turbulence characteristic?
- a) No vertical mixing
 - b) Weak mechanical turbulence due to stratification
 - c) Convective mixing is greater than mechanical turbulence
 - d) Only mechanical turbulence**

Answer: d

Explanation: When Richardson number is zero, there is mechanical turbulence alone.

6. Below what Richardson number does convective mixing start dominating mechanical turbulence?
- a) 0
 - b) -0.04**
 - c) -0.03
 - d) -0.1

Answer: b

Explanation: Between 0 and -0.03, both mechanical turbulence and convective mixing are present, but mechanical turbulence is greater. Below -0.04, convective mixing starts dominating.

7. What is high pressure area with sinking air also known as?
- a) Cyclone
 - b) Anti-cyclone**
 - c) Eddy zone
 - d) Richardson zone

Answer: b

Explanation: Anticyclones are high pressure regions with low ventilation where air is sinking, and is warmed by compression.

8. What does the term "turbidity" indicate in atmospheric quality?
- a) Indicates density of clouds
 - b) Reduction of light due to dust particles**
 - c) Indicates the humidity
 - d) Turbulence of winds

Answer: b

9. Which of the following gases vary significantly over time and place at the atmospheric boundary level?
- a) Carbon dioxide
 - b) Ozone
 - c) Water vapour**
 - d) Oxygen

Answer: c

Explanation: Water vapour varies based on time and place at the atmospheric boundary level due to the continuous action of evaporation and condensation near water bodies.

10. How does atmospheric pressure vary with increase in altitude?
- a) It decreases linearly
 - b) It decreases exponentially**
 - c) It increases linearly
 - d) It increases till stratosphere and then starts decreasing exponentially

Answer: b

11. What does the term obliquity indicate?
- a) Earth's axial tilt of 23.5 degrees**
 - b) Alignment of the Earth's internal magnetic field
 - c) Analysis of ocean currents
 - d) Pressure variation over different seasons

Answer: a

12. Which are the two forces balanced by the geostrophic wind?
- a) Coriolis effect and pressure gradient force**
 - b) Coriolis force and centrifugal force
 - c) Frictional force and pressure gradient force
 - d) Pressure gradient force and centrifugal force

Answer: a

13. Which of the following has the highest albedo?
- a) Water surface
 - b) Plateau surfaces
 - c) Vegetation
 - d) Fresh snow**

Answer D

14. The stability of the stratosphere is due to which of the following reasons?
- a) Absorption of solar energy by ozone layer**
 - b) Strong wind currents
 - c) Pressure is minimal
 - d) All of the mentioned

Answer: a

Explanation: The ozone layer in the stratosphere absorbs radiations (mainly UV) coming from the sun. This energy is the key to stratospheric stability.

15. Which of the following is regarded as climate control factor(s)?
- a) Latitude
 - b) Elevation
 - c) Ocean currents
 - d) All of the mentioned**

Answer: d

Explanation: Climate is affected by latitude, elevation, ocean currents, etc.

16. Which plant helps in detection of pollution from automobile exhaust?

- a) Neem
- b) Tulsi**
- c) Lichen
- d) Lettuce

Answer: b

Explanation: The tulsi plant is used as a bio-indicator to detect pollution due to exhaust from automobiles.

17. Which of the following plants aid as an indicator to ozone pollution?

- a) Tomato
- b) Tobacco
- c) Watermelon
- d) All of the mentioned**

Answer: d

Explanation: Tomato, tobacco and watermelon are highly sensitive to ozone, and thereby contribute to indicating ozone pollution.

18. Greater the Air Quality Index of a region, more polluted is the air.

- a) True**
- b) False

Answer: a

Explanation: Air Quality Index is a number used to indicate the severity of air pollution in a given region. Hence more the AQI more is the pollution.

19. How many parameters are taken into consideration when measuring air quality, in India?

- a) 4
- b) 3
- c) 8**
- d) 9

Answer: c

20. Which of the following pollutants are considered when measuring air quality?

- a) CO, O₃, PM_{2.5}
- b) NH₃, PM₁₀, Pb
- c) NO₂, SO₂
- d) All of the mentioned**

Answer: d

Explanation: All the mentioned 8 pollutants' concentrations over a 24 hour period are considered when measuring air quality.

21. What range of air quality index has the most severe impact on human health?
- a) 101-200
 - b) 201-300
 - c) 301-400
 - d) 401-500**
- Answer: d
- Explanation: Air quality is regarded as severe when it has an index of 401-500, and affects even healthy people and impacts them even during simple activity.
22. Hazardous pollutants are those pollutants for which air quality standards have been devised.
- a) True
 - b) False**
- Answer: b
- Explanation: Hazardous pollutants do not have a defined air quality standard but contribute to severe health damage and mortality rate.
23. Which of the following devices is NOT used to control particulate emissions?
- a) Electrostatic precipitator
 - b) Bag filters
 - c) Catalytic converters**
 - d) All of the mentioned
- Answer: c
24. Which of the mentioned devices are used for removing vapour phase/ gaseous pollutants?
- a) Absorption towers
 - b) Catalytic converters
 - c) Thermal oxidisers
 - d) All of the mentioned**
- Answer: d
- Explanation: Absorption tower, catalytic converters and thermal oxidisers filter out harmful gaseous pollutants from the air.
25. At what concentration (in ppm), is nitrogen present in the atmosphere?
- a) 780,840**
 - b) 390,420
 - c) 78,084
 - d) 900,000
- Answer: a
27. In the lower layers of atmosphere, what range of wavelengths of light is predominant?
- a) Less than 100 nm
 - b) Greater than 300 nm**
 - c) Between 100-300 nm

d) All wavelengths are equally present

Answer: b