CUET PG 2024 Atmospheric Science Question Paper with Solutions

Time Allowed :1 Hour 45 Mins	**Maximum Marks :**300	**Total Questions :**75

General Instructions

Read the following instructions very carefully and strictly follow them:

1. The examination duration is 105 minutes. Manage your time effectively to attempt all questions within this period.
2. The total marks for this examination are 300. Aim to maximize your score by strategically answering each question.
3. There are 75 mandatory questions to be attempted in the Atmospheric Science paper. Ensure that all questions are answered.
4. Questions may appear in a shuffled order. Do not assume a fixed sequence and focus on each question as you proceed.
5. The marking of answers will be displayed as you answer. Use this feature to monitor your performance and adjust your strategy as needed.
6. You may mark questions for review and edit your answers later. Make sure to allocate time for reviewing marked questions before final submission.
7. Be aware of the detailed section and sub-section guidelines provided in the exam. Understanding these will aid in effectively navigating the exam.

1. On a hot summer day while travelling in a bus you notice a distant patch of road which appears to be wet. This phenomenon of mirage is due to:
(a) Chromatic aberration
(b) Rayleigh scattering
(c) Total internal reflection
(d) Mie scattering

Correct Answer: (c) Total internal reflection.

Solution: The phenomenon of mirage occurs due to total internal reflection. Light rays bend due to temperature gradients in the air, making distant objects appear displaced, especially on hot days.

Quick Tip

Mirages occur because of the refraction and total internal reflection of light, especially in hot environments where temperature differences create layers of air with different densities.

2. Arrange the principal gases of dry air in the decreasing order of their abundance in the atmosphere of the Earth.
(A) Krypton
(B) Argon
(C) Methane
(D) Carbon dioxide
Choose the correct answer from the options given below:
(a) (A). (B). (C). (D).
(b) (B). (D). (C). (A).
(c) (A). (B). (D). (O).
(d) (C). (B). (D). (A).
Correct Answer: (b) (B) (D) (C) (A).

Solution: The order of gases in Earth's atmosphere based on their abundance is: Argon, Carbon dioxide, Methane, and Krypton. Carbon dioxide is a trace gas but significant in climate dynamics.

Quick Tip

The most abundant gases in the atmosphere are nitrogen and oxygen, with trace gases like carbon dioxide and methane influencing climate.

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3. Which of the following are most suitable conditions for photochemical smog formation in ambient atmosphere?
(a) SO2, water vapors, sunlight (T ¿ 25°C)
(b) NO2, water vapors, sunlight (T ¿ 25°C)
(c) NO2, volatile hydrocarbons, sunlight (T ¿ 25°C)
(d) SO2, fog, volatile hydrocarbons, sunlight (T ¡ 25°C)

Correct Answer: (c) NO2, volatile hydrocarbons, sunlight (T ¿ 25°C).

Solution: Photochemical smog forms when nitrogen oxides (NO2) and volatile organic compounds (VOCs) react with sunlight at high temperatures (above 25°C), producing harmful secondary pollutants.

Quick Tip

Photochemical smog is common in urban areas with high vehicle emissions, especially under sunny, warm conditions.

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4. The potential energy of a system of four particles (mass 'm') placed at the

vertices of a square of side "l" would be
(a) 1.414 Gm2 /l
(b) 5.41 Gm2 /l
(c) -1.414 Gm2 /l
(d) -5.416 Gm2 /l

Correct Answer: (d) -5.416 Gm2 /l.

Solution: The potential energy of the system can be calculated by considering the gravitational potential energy between each pair of particles at the vertices of the square. The result is negative due to the attractive nature of the gravitational force.

Quick Tip

Gravitational potential energy between particles depends on their distance and the masses involved. A negative potential energy indicates attraction.

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5. Which of the following is NOT a criteria pollutant under National Ambient Air Quality Standards in India?
(a) Carbon monoxide
(b) Carbon dioxide
(c) Ground-level ozone
(d) PM10

Correct Answer: (b) Carbon dioxide.

Solution: Carbon dioxide is not a criteria pollutant under the National Ambient Air Quality Standards (NAAQS) in India, although it contributes to climate change. Criteria pollutants include substances like CO, Ozone, and PM10.

Quick Tip

Carbon dioxide is a greenhouse gas, but it is not considered a local air quality issue like the criteria pollutants.

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6. Average ocean salinity of 35 ppt can also be expressed as
(a) 35%
(b) 3.5%
(c) $35\text{x}10^{-12}$
(*d*)0.35%

Correct Answer: (b) 3.5

Solution: The average ocean salinity is 35 parts per thousand (ppt), which is equivalent to 3.5

Quick Tip

Salinity is often expressed in ppt or percentage, with seawater averaging 3.5

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7. Consider the following list of processes. L = P1, P2, P3, P4 having CPU bursts. T = 6, 8, 7, 4 in milliseconds. Applying shortest job first CPU scheduling, compute the average waiting time.
(a) 6.75 milliseconds
(b) 7.25 milliseconds
(c) 7.75 milliseconds
(d) 6.25 milliseconds

Correct Answer: (c) 7.75 milliseconds.

Solution: By applying the Shortest Job First (SJF) scheduling algorithm, the processes are executed in the order of their burst times: P4 (4 ms), P1 (6 ms), P3 (7 ms), P2 (8 ms). The average waiting time is calculated by determining the waiting times for each process and averaging them.

Quick Tip

SJF scheduling minimizes waiting time by processing the shortest tasks first, ensuring optimal scheduling when burst times are known in advance.

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8. The hotter objects radiate more total energy per unit area than do colder objects. This concept is referred to as
(a) Wien's displacement law
(b) Kirchhoff's law
(c) Kepler's law
(d) Stefan-Boltzmann law

Correct Answer: (d) Stefan-Boltzmann law.

Solution: The Stefan-Boltzmann law states that the total energy radiated by a blackbody is proportional to the fourth power of its temperature.

Quick Tip

Hotter objects emit more energy at all wavelengths, and this is quantified by the Stefan-Boltzmann law.

9. Match List I with List II

List I	List II
(A) UV-Visible	(I) Vibrational motion
(B) Infrared	(II) Ejection of internal electron
(C) Microwave	(III) Ejection of outer electron
(D) X-rays	(IV) Rotational motion

Choose the correct answer from the options given below:
(a) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
(b) (A) - (III), (B) - (I), (C) - (IV), (D) - (II)
(c) (A) - (III), (B) - (II), (C) - (IV), (D) - (I)
(d) (A) - (IV), (B) - (III), (C) - (II), (D) - (I)

Correct Answer: (b) (A) - (III), (B) - (I), (C) - (IV), (D) - (II)

Solution: UV-Visible radiation causes electronic transitions, Infrared radiation excites vibrations, Microwaves induce rotational motion, and X-rays cause ionization of atoms.

Quick Tip

Different types of electromagnetic radiation interact with matter in unique ways, depending on their energy and wavelength.

10. A cyclonic circulation denotes
(A) Counterclockwise circulation in the northern hemisphere
(B) Clockwise circulation in the northern hemisphere
(C) Clockwise circulation in the southern hemisphere
(D) Counterclockwise circulation in the southern hemisphere

Choose the correct answer from the options given below:
(a) (B) only.
(b) (B) and (D) only.
(c) (A) and (C) only.
(d) (D) only.

Correct Answer: (c) (A) and (C) only.

Solution: Cyclonic circulation refers to the rotation of air masses in a cyclone. In the Northern Hemisphere, cyclonic circulation is counterclockwise (A), while in the Southern Hemisphere, it is clockwise (C) due to the Coriolis effect. Therefore, the correct answer is (A) and (C).

Quick Tip

The Coriolis effect causes moving air to turn left in the Southern Hemisphere and right in the Northern Hemisphere, influencing cyclonic systems.

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11. Which of the following is not a consequence of increasing acidification of oceans?
(a) Adverse effects on growth and survival of calcareous phytoplanktons
(b) Adverse effects on growth and survival of coral reefs
(c) Adverse effects on cloud seedling and formation
(d) Adverse effects on survival of animals that have phytoplanktonic larvae

Correct Answer: (c) Adverse effects on cloud seedling and formation.

Solution: Ocean acidification primarily impacts marine life, especially organisms that rely on calcium carbonate, such as phytoplanktons and coral reefs. It does not directly affect cloud seeding and formation.

Quick Tip

Ocean acidification is caused by increased atmospheric CO2, leading to lower pH in seawater, which affects marine ecosystems.

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12. The average decrease of 6.5°C in temperature per kilometer in the troposphere is referred to as
(a) Temperature inversion
(b) Environmental lapse rate
(c) Adiabatic lapse rate
(d) Geothermal gradient

Correct Answer: (b) Environmental lapse rate.

Solution: The environmental lapse rate refers to the rate at which temperature decreases with altitude in the troposphere. Typically, this rate is around 6.5°C per kilometer.

Quick Tip

The environmental lapse rate is important for understanding atmospheric stability and weather patterns.

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13. In rate-monotonic scheduling, the worst-case CPU utilization achieved for execution of N processes can be expressed as

(a) 2^N
(b) $2^N - 1$
(c) $N(2^N - 1)$
(d) $N(2^{\frac{1}{N}} - 1)$

Correct Answer: (d) $N(2^{\frac{1}{N}} - 1)$.

Solution: In rate-monotonic scheduling, the worst-case CPU utilization for execution of N processes can be expressed as $N(2^{\frac{1}{N}} - 1)$. This formula provides the worst-case utilization when tasks have different execution times and periods.

Quick Tip

In rate-monotonic scheduling, higher priority is given to tasks with shorter periods, and the formula above calculates the worst-case CPU utilization.

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14. The occurrence of aurora borealis and aurora australis takes place in the
(a) Troposphere
(b) Stratosphere
(c) Thermosphere
(d) Tropopause

Correct Answer: (c) Thermosphere.

Solution: Auroras occur in the thermosphere due to the interaction of charged particles from the solar wind with Earth's magnetic field. These particles excite atoms, causing them to emit light.

Quick Tip

Auroras are visible near the poles and are caused by interactions between solar wind particles and Earth's magnetic field.

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15. Arrange the following greenhouse gases in increasing order of their contribution to total global warming.
(A) CH4
(B) N2O
(C) CO2
(D) CFCs
Choose the correct answer from the options given below:
(a) (C), (A), (B), (D)
(b) (B), (D), (A), (C)
(c) (D), (B), (A), (C)

(d) (C), (B), (D), (A)

Correct Answer: (b) (B), (D), (A), (C).

Solution: The contribution of greenhouse gases to global warming varies greatly due to differences in their global warming potential (GWP). CFCs have a much higher GWP compared to CO2 and methane. Nitrous oxide (N2O) has a higher GWP than CO2 but lower than CFCs. The order of increasing contribution to global warming is: N2O (B), CFCs (D), methane (CH4) (A), and CO2 (C).

Quick Tip

Greenhouse gases like CFCs and methane have much higher global warming potentials than CO2, which is more abundant but less potent in warming.

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16. Absolute humidity in ambient air at a given temperature T is 3 g/m^3. Maximum absolute humidity at the same temperature T is 10 g/m^3. What will the relative humidity at the same temperature T?
(a) 3%
(b) 0.3%
(c) 3.3%
(d) 30%

Correct Answer: (d) 30%.

Solution: Relative humidity is calculated as the ratio of the actual absolute humidity to the maximum absolute humidity at the same temperature. Here, $\frac{3}{10} \times 100 = 30\%$.

Quick Tip

Relative humidity indicates how much moisture is in the air relative to the maximum amount it can hold at a given temperature.

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17. The zone of atmospheric window falls in the wavelength range of
(a) 0.4 to 0.7 µm
(b) 8 to 12 mm
(c) 8 to 12 µm
(d) 1 to 3 µm

Correct Answer: (c) 8 to 12 µm.

Solution: The atmospheric window is the range of wavelengths in the infrared region (8 to 12

μm) through which Earth's radiation escapes into space.

> Quick Tip
>
> The atmospheric window allows for the escape of infrared radiation, which is important for Earth's energy balance.

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18. Match List I with List II

Types of Scattering	**Example**
(A) Rayleigh scattering	(I) Haze
(B) Mie scattering	(II) Blue Sky
(C) Non-selective scattering	(III) Scattering of low intensity light by electron
(D) Thomson scattering	(IV) Cloud appears white

Choose the correct answer from the options given below:
(a) (A) - (II), (B) - (I), (C) - (IV), (D) - (III)
(b) (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
(c) (A) - (I), (B) - (II), (C) - (IV), (D) - (III)
(d) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (a) (A) - (II), (B) - (I), (C) - (IV), (D) - (III)

Solution: Rayleigh scattering causes the blue sky, Mie scattering causes haze, Non-selective scattering causes white clouds, and Thomson scattering involves light scattered by electrons.

> Quick Tip
>
> Scattering is classified based on the particle size relative to the wavelength of light.

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19. Match List I with List II

Soil Type	**Characteristics**
(A) Oxisol	(I) Acid soil with leached upper horizon
(B) Spodosol	(II) Young soils with no horizon
(C) Entisol	(III) Clay rich soils
(D) Vertisol	(IV) Highly weathered tropical and sub-tropical soils

Choose the correct answer from the options given below:
(a) (A) - (III), (B) - (II), (C) - (I), (D) - (IV)
(b) (A) - (IV), (B) - (II), (C) - (I), (D) - (III)
(c) (A) - (I), (B) - (II), (C) - (IV), (D) - (III)

(d) (A) - (IV), (B) - (I), (C) - (II), (D) - (III)

Correct Answer: (d) (A) - (IV), (B) - (I), (C) - (II), (D) - (III)

Solution: Oxisols are highly weathered tropical soils (A - IV), Spodosols are characterized by acidic leaching (B - I), Entisols are young soils without well-developed horizons (C - II), and Vertisols are rich in clay (D - III).

Quick Tip

Soil types are classified based on their formation processes and characteristics such as acidity, horizon development, and clay content.

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20. PM10 stands for particulate matter having particles smaller than or equal to 10 µm, with respect to the particle characteristics 10 µm represents
(a) Radius of the particle
(b) Length of the particle
(c) Aerodynamic diameter of the particle
(d) Wavelength of the particle

Correct Answer: (c) Aerodynamic diameter of the particle.

Solution: PM10 refers to particulate matter with an aerodynamic diameter of 10 micrometers or less. This means the particle's size is defined by its ability to be suspended in the air and be inhaled.

Quick Tip

The aerodynamic diameter is used to describe how particles behave when suspended in air, influencing their ability to enter the respiratory system.

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21. Choose the incorrect statement
(a) Rising air expands and cools
(b) Moist air rises to lower height compared to hot air under adiabatic conditions
(c) Sinking air will compress
(d) Moist air cools and expands slowly than warm air under adiabatic conditions

Correct Answer: (b) Moist air rises to lower height compared to hot air under adiabatic conditions.

Solution: Moist air actually rises higher compared to dry air because it has a lower density due to the latent heat released during condensation.

Quick Tip

The presence of water vapor in air makes moist air less dense, allowing it to rise more easily than dry air under adiabatic conditions.

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22. Which of the following zones in a lake will have maximum nutrient and minimum dissolved oxygen?
(a) Littoral zone
(b) Profundal zone
(c) Benthic zone
(d) Epilimnion

Correct Answer: (c) Benthic zone.

Solution: The benthic zone, being the bottom layer of the lake, has higher nutrient levels due to the accumulation of organic matter, but it also has the lowest dissolved oxygen levels due to limited water circulation and decaying matter.

Quick Tip

The benthic zone is characterized by a high concentration of nutrients from decomposed organic matter, but also lower dissolved oxygen due to limited mixing and high organic decay.

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23. Mission LiFE was proposed by India in
(a) Paris convention held in the year 2015
(b) Conference of Parties-26 held in Glasgow in the year 2021
(c) G-20 presidency period in the year 2023
(d) Conference of Parties-27 held in Egypt in the year 2022

Correct Answer: (b) Conference of Parties-26 held in Glasgow in the year 2021.

Solution: Mission LiFE (Lifestyle for Environment) was proposed by India at COP-26 in Glasgow in 2021, with the aim of promoting sustainable lifestyles to mitigate climate change.

Quick Tip

Mission LiFE focuses on encouraging people to adopt sustainable living practices that contribute to global environmental goals, launched at COP-26.

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24. A narrow whitish ring with a large diameter centered on the sun is referred to as
(a) Corona
(b) Glory
(c) Halo
(d) Sun Pillar

Correct Answer: (c) Halo.

Solution: A halo is a ring of light that forms around the sun (or moon) due to the refraction of light by ice crystals in the atmosphere.

Quick Tip

Halos are caused by the interaction of light with ice crystals in high-altitude clouds, creating a ring of light around the sun or moon.

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25. Which of the following is an example of one of the most violent weather disturbances that occurs on the earth?
(a) Typhoons
(b) Hurricane
(c) Squall line
(d) Tornadoes

Correct Answer: (d) Tornadoes.

Solution: Tornadoes are the most violent weather disturbances, with wind speeds that can exceed 300 mph, making them much more destructive than typhoons or hurricanes.

Quick Tip

Tornadoes are characterized by their extreme wind speeds and localized destruction, often causing more damage than other storms in a concentrated area.

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26. Match List I with List II

Climate	**Characteristics**
(A) Tropical	(I) Humid, Warm Summer
(B) Drylands	(II) Ice caps
(C) Sub Tropical	(III) Steppe
(D) Polar	(IV) Rainforest

Choose the correct answer from the options given below:
(a) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
(b) (A) - (IV), (B) - (III), (C) - (I), (D) - (II)
(c) (A) - (I), (B) - (II), (C) - (IV), (D) - (III)
(d) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (b) (A) - (IV), (B) - (III), (C) - (I), (D) - (II)

Solution: Tropical climates are typically associated with rainforests, drylands are steppe climates, subtropical climates have warm summers, and polar climates are ice-capped.

Quick Tip

Climate classification helps to categorize regions based on temperature and precipitation patterns, with specific examples of flora and fauna adapted to each type.

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27. The process of aging of lakes/ponds (cultural Eutrophication) is primarily caused by
(a) Reduction in precipitation
(b) Excessive nutrient input to lake or ponds over short period
(c) Input from acid rain
(d) Deforestation along the lake and ponds

Correct Answer: (b) Excessive nutrient input to lake or ponds over short period.

Solution: Eutrophication occurs due to excessive nutrient loading, especially nitrogen and phosphorus, which leads to algal blooms and depletion of oxygen in the water.

Quick Tip

Excessive fertilizer use and wastewater discharge can accelerate eutrophication, which disrupts the aquatic ecosystem and leads to hypoxia.

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28. The Képpen classification is based on
(a) Monthly and average values of Temperature
(b) Monthly and average values of Evaporation
(c) Monthly and average values of Precipitation
(d) Monthly and average values of Evapotranspiration

Choose the correct answer from the options given below:
(a) (B) and (D) only
(b) (A) and (C) only

(c) (A), (B), (C), and (D)
(d) (C) only

Correct Answer: (b) (A) and (C) only.

Solution: The Képpen classification uses temperature and precipitation data to categorize climates, focusing on how they affect vegetation patterns.

Quick Tip

The Képpen system is one of the most widely used methods for climate classification, helping to understand regional climate patterns and their impact on ecosystems.

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29. Choose the correct statements
(A) Earth undergoes three basic motions: yearly revolution around Sun, daily rotation on its axis, and a slow wobble of its axis
(B) Precession is a slow wobbling of the axis as Earth spins
(C) Apparent solar day is twenty-four hours as determined from mean solar time
(D) The event of time, noon, is the instant the Sun appears to move across the celestial meridian.

Choose the correct answer from the options given below:
(a) (A), (C), and (D) only
(b) (A), (B), and (C) only
(c) (B), (C), and (D) only
(d) (A), (B), and (D) only

Correct Answer: (d) (A), (B), and (D) only.

Solution: Earth's three basic motions include its yearly revolution around the Sun, daily rotation on its axis, and the slow wobble of its axis (precession). The event of time "noon" refers to when the Sun crosses the celestial meridian. The apparent solar day is not fixed to 24 hours due to the Earth's elliptical orbit and axial tilt.

Quick Tip

The Earth's axial tilt and precession affect long-term variations in climate and the length of days and nights, which influence seasonal patterns.

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30. Choose the correct statements
(a) Transparent water can never be contaminated
(b) River water will have high dissolved oxygen in winter compared to summer
(c) Turbid water under sunlight becomes warmer faster than clean water

(d) Pure water is a good conductor of electricity

Choose the correct answer from the options given below:
(a) (A), (B), and (C) only.
(b) (A) and (C) only.
(c) (B) and (C).
(d) (A) and (D) only.

Correct Answer: (c) (B) and (C).

Solution: River water has higher oxygen levels in winter due to lower temperatures and less biological activity. Turbid water heats faster in sunlight due to its higher absorbance of light.

Quick Tip

Turbid water absorbs more solar radiation, causing it to warm faster, while clear water reflects more light, remaining cooler.

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31. Choose the correct statements about earthquakes.
(a) Seismograph measures P, S, and surface waves
(b) S and P waves leave the focus of the earthquake essentially at the same time
(c) S waves move faster than P waves and get separated from each other
(d) Shallow earthquakes occur up to a depth of 70 km from Earth's surface

Choose the correct answer from the options given below:
(a) (A), (B) and (C) only.
(b) (A), (B) and (D) only.
(c) (A), (C) and (D) only.
(d) (B), (C) and (D) only.

Correct Answer: (b) (A), (B) and (D) only.

Solution: Seismographs measure P, S, and surface waves. S waves move slower than P waves, not faster, and do not separate in the way described. Shallow earthquakes typically occur at depths up to 70 km.

Quick Tip

Seismic waves are classified into body waves (P and S) and surface waves, and they travel at different speeds through various layers of the Earth.

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32. Choose the correct statements about El-Nino.

(a) El-Nino is a warm current in the Pacific ocean near the coast of Peru
(b) El-Nino is a cold current in the Pacific ocean near the coast of Peru
(c) El-Nino is an example of atmosphere-ocean interaction
(d) El-Nino is an equatorial counter current.

Choose the correct answer from the options given below:
(a) (B) and (D) only.
(b) (A), (B), (C) and (D)
(c) (C) and (D) only.
(d) (A), (C) and (D) only

Correct Answer: (d) (A), (C) and (D) only.

Solution: El-Nino refers to the warm ocean current in the Pacific near Peru, which is an example of atmosphere-ocean interaction and is a significant equatorial countercurrent.

Quick Tip

El-Nino impacts global weather patterns by disrupting normal ocean currents and atmospheric conditions in the tropical Pacific region.

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33. Reconstruction of past climates can be done using indirect evidence from
(a) Tree-growth rings
(b) Cobalt isotope ratio in ice core
(c) Oxygen isotope ratio in glacial ice
(d) Sulphur isotope ratio in ice core

Choose the correct answer from the options given below:
(a) (A), (B), (C), (D)
(b) (A) and (C) only.
(c) (A), (C) and (D) only.
(d) (B), (C) and (D) only.

Correct Answer: (b) (A) and (C) only.

Solution: Past climates can be reconstructed using tree rings and oxygen isotope ratios in ice cores, which provide valuable data on historical temperature and precipitation patterns.

Quick Tip

Tree rings, oxygen isotope ratios in ice, and other proxies provide insights into past climate conditions, helping scientists understand historical climate changes.

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34. Match List-I with List-II

Natural Causes of Climate Change	Associated Activity
(A) Plate tectonics	(I) Sing ge-mirariils along femm climate
(B) Solar variability	(II) Change in reflectivity of the atmosphere
(C) Variation in Earth's orbit	(III) Rearrangement of the continents
(D) Volcanic activity	(IV) Sunspots activity

Choose the correct answer from the options given below:
(a) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
(b) (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
(c) (A) - (III), (B) - (II), (C) - (I), (D) - (IV)
(d) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (d) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Solution: Plate tectonics influences Earth's climate by rearranging continents and oceans. Solar variability, such as sunspots activity, affects Earth's climate by changing the amount of sunlight. The Earth's orbit variation and volcanic activity contribute to long-term climate changes.

Quick Tip

Natural climate change is influenced by factors such as plate tectonics, solar activity, volcanic eruptions, and variations in Earth's orbit.

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35. Choose the correct statements
(a) Ozone depletion/ozone layer thinning in stratosphere occurs only over the south pole
(b) Ozone depletion/ozone layer thinning in stratosphere does not occur over the north pole
(c) Columnar ozone in atmosphere is measured in 1/100 unit of mm
(d) Polar stratospheric clouds are largely responsible for ozone layer thinning over the south pole

Choose the correct answer from the options given below:
(a) (B) and (D) only.
(b) (B) and (C) only.
(c) (A) and (C) only.
(d) (C) and (D) only.

Correct Answer: (d) (C) and (D) only.

Solution: Ozone layer thinning occurs over both poles, but it is more pronounced over the south pole. Polar stratospheric clouds contribute to ozone depletion. Columnar ozone is measured in Dobson units.

Quick Tip

Ozone depletion is a significant environmental issue, mainly caused by CFCs and other chemicals that break down ozone molecules in the stratosphere.

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36. Match List I with List II

Radiation Law	**Equation**
(A) Beer Lambert's Law	(I) $\lambda_{\max} = bT$
(B) Wien's displacement law	(II) $\alpha_\lambda = \epsilon\lambda$
(C) Planck's formula of low frequencies	(III) $I = I_0 e^{-\mu(x)}$
(D) Kirchof's law	(IV) $I_\lambda = 2C\lambda^{-4}KT$

Choose the correct answer from the options given below:
1. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
2. (A) - (I), (B) - (III), (C) - (IV), (D) - (II)
3. (A) - (III), (B) - (I), (C) - (IV), (D) - (II)
4. (A) - (III), (B) - (I), (C) - (II), (D) - (IV)

Correct Answer: (c) (A) - (III), (B) - (I), (C) - (IV), (D) - (II)

Solution: - Beer Lambert's law is associated with the equation for light absorption: $I = I_0 e^{-\mu(x)}$. - Wien's displacement law relates the maximum wavelength of emitted radiation to temperature: $\lambda_{\max} = bT$. - Planck's formula describes the spectral distribution of blackbody radiation at low frequencies. - Kirchof's law relates the emission of radiation to the temperature of an object: $I_\lambda = 2C\lambda^{-4}KT$.

Quick Tip

Radiation laws govern how energy is emitted or absorbed by bodies, especially in the context of temperature and wavelength.

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37. Given below is the concentration of CO in the atmosphere in the last 11 years. Calculate the mean and median concentration of CO.
Year Concentration of CO (in ppm)
2013 330
2014 340
2015 350
2016 360
2017 370
2018 380
2019 390
2020 400

2021 410
2022 420
2023 425

Choose the correct answer from the options given below:
1. 390 and 370
2. 379.54 and 370
3. 379.54 and 380
4. 370 and 380

Correct Answer: (c) 379.54 and 380

Solution: The mean concentration is calculated by summing the concentrations and dividing by the number of years. The median is the middle value when the data is ordered.

Quick Tip

To calculate the mean, sum all values and divide by the number of values. For the median, order the values and find the middle value.

---

38. Arrange the following periods of the Paleozoic era in the correct order starting from older to younger.
(A) Cambrian
(B) Devonian
(C) Carboniferous
(D) Permian
(E) Silurian

Choose the correct answer from the options given below:
(a) (A), (E), (B), (D), (C)
(b) (A), (C), (B), (D), (E)
(c) (A), (E), (B), (C), (D)
(d) (D), (C), (B), (E), (A)

Correct Answer: (c) (A), (E), (B), (C), (D).

Solution: The Paleozoic era is divided into five periods in the following order: Cambrian, Silurian, Devonian, Carboniferous, and Permian.

Quick Tip

The Paleozoic era spans from approximately 541 to 252 million years ago and saw the emergence of complex life forms.

39. The two coherent sources of intensity ratio β interfere. The value of $\frac{I_{max}-I_{min}}{I_{max}+I_{min}}$ is:
(a) $\frac{2}{\beta\sqrt{1+\beta}}$
(b) $\frac{1+\beta}{2\sqrt{\beta}}$
(c) $\frac{2\sqrt{\beta}}{1+\beta}$
(d) $\frac{\beta}{\sqrt{1+\beta}}$

Correct Answer: (c) $\frac{2\sqrt{\beta}}{1+\beta}$.

Solution: The intensity ratio $\frac{I_{max}-I_{min}}{I_{max}+I_{min}}$ in interference patterns is related to the amplitude ratio β using the formula $\frac{2\sqrt{\beta}}{1+\beta}$.

Quick Tip

In wave interference, the intensity difference depends on the amplitude ratio between the sources, influencing the constructive and destructive interference patterns.

---

40. A radio station which can tune in to 7.5 MHz to 12 MHz corresponds to the wavelength band,
(a) 4.0m to 2.5m
(b) 40m to 25m
(c) 10m to 25m
(d) 1.0m to 35m

Correct Answer: (b) 40m to 25m.

Solution: The wavelength (λ) is related to frequency (f) by the formula $\lambda = \frac{c}{f}$, where c is the speed of light. For frequencies of 7.5 MHz to 12 MHz, the corresponding wavelengths are in the range of 40m to 25m.

Quick Tip

To calculate the wavelength from the frequency, use the formula $\lambda = \frac{c}{f}$, where c is approximately 3×10^8 m/s.

---

41. The magnetic field of the earth is thought to arise due to
(a) A bar magnet placed inside the Earth
(b) Iron in the crust
(c) Convective motion of metallic fluids in the outer core

(d) Electric currents running through the mantle of the Earth

Correct Answer: (c) Convective motion of metallic fluids in the outer core.

Solution: The Earth's magnetic field is generated by the movement of molten iron and other metals in the outer core, creating convection currents that generate the magnetic field.

Quick Tip

Earth's magnetic field is mainly caused by the movement of conductive molten materials in its outer core.

---

42. Standard deviation for the first 10 even natural numbers is
(a) 11
(b) 7.74
(c) 5.74
(d) 11.48

Correct Answer: (c) 5.74.

Solution: The standard deviation for the first 10 even natural numbers can be calculated by finding the square root of the average of the squared deviations from the mean.

Quick Tip

The standard deviation measures how spread out the numbers are in a dataset, and can be calculated using the deviations from the mean.

---

43. Mean square deviation of a distribution is least when deviations are taken about
(a) Mean
(b) Median
(c) Mode
(d) Both mean and mode

Correct Answer: (a) Mean.

Solution: The mean square deviation (or variance) is minimized when the deviations are taken about the mean, because the mean is the point that minimizes the sum of squared deviations.

Quick Tip

The mean minimizes the sum of squared deviations, making it the best measure for minimizing variance.

---

44. 10 is the mean of a set of 7 observations and 5 is the mean of a set of 3 observations, the mean of the combined set is
(a) 10
(b) 15
(c) 8.5
(d) 7.2

Correct Answer: (c) 8.5.

Solution: To find the mean of the combined set, use the formula for the combined mean:

$$\frac{(7 \times 10) + (3 \times 5)}{7 + 3} = \frac{70 + 15}{10} = 8.5$$

Quick Tip

The combined mean is calculated by taking the weighted average of the individual means based on the number of observations in each set.

---

45. A statistical measure which cannot be determined graphically is
(a) Median
(b) Mode
(c) Harmonic mean
(d) Mean

Correct Answer: (c) Harmonic mean.

Solution: The harmonic mean is a specific type of average that cannot be determined directly from graphical methods, as it involves reciprocals of the data points.

Quick Tip

The harmonic mean is best calculated algebraically, particularly when dealing with rates or ratios.

---

46. An ogive is used to determine

(a) Mean
(b) Median
(c) Mode
(d) Harmonic mean

Correct Answer: (b) Median.

Solution: An ogive is a cumulative frequency curve that is used to determine the median and other percentiles of a dataset.

Quick Tip

Ogives are useful for determining the median, quartiles, and percentiles in a dataset.

---

47. If the coefficient of variance and the standard deviation of a distribution are 60 and 21 respectively, then their arithmetic mean is
(a) 35
(b) 2000/7
(c) $2\sqrt{3}$
(d) $\sqrt{35}$

Correct Answer: (a) 35

Solution: The coefficient of variation is the ratio of the standard deviation to the mean, and with the given values, we can use algebraic manipulation to find the mean.

Quick Tip

The coefficient of variation provides a measure of relative variability, and can be used to compute the mean when combined with the standard deviation.

---

48. For dealing with qualitative data the best average is
(a) Arithmetic mean
(b) Geometric mean
(c) Mode
(d) Median

Correct Answer: (d) Median.

Solution: For qualitative data, the median is the best measure of central tendency, as it is not affected by extreme values and better represents the middle value.

Quick Tip

The median is often preferred for ordinal data or data with outliers, as it represents the middle point without being skewed by extreme values.

---

49. The coefficient of correlation between X and Y is 0.6. Their covariance is 4.8. The variance of X is 9. Then the standard deviation of Y is
(a) $\frac{4.8}{3\times0.6}$
(b) $\frac{0.6}{3\times4.8}$
(c) $\frac{3}{0.6\times4.8}$
(d) $\frac{4.8}{9\times0.6}$

Correct Answer: (a) $\frac{4.8}{3\times0.6}$.

Solution: The formula for the correlation coefficient is $r = \frac{\text{cov}(X,Y)}{\sigma_X \sigma_Y}$, and using this, we can solve for the standard deviation of Y.

Quick Tip

The correlation coefficient helps us relate the standard deviations of two variables with their covariance.

---

50. The correlation coefficient between X and Y will have a positive sign when
(a) X is increasing and Y is decreasing
(b) Both X and Y are increasing
(c) X is decreasing and Y is increasing
(d) There is no change in X and Y

Correct Answer: (c) X is decreasing and Y is increasing.

Solution: The correlation coefficient will be positive when both variables are moving in opposite directions, such as when X decreases and Y increases, indicating an inverse relationship.

Quick Tip

A positive correlation occurs when variables tend to move in opposite directions, such as one decreasing while the other increases.

---

51. The coefficient of correlation is independent of
(a) Change of scale only
(b) Change of origin only

(c) Both change of scale and origin
(d) Neither change of scale nor change of origin

Correct Answer: (c) Both change of scale and origin.

Solution: The coefficient of correlation is independent of changes in scale and origin, meaning that multiplying or adding a constant to the data does not affect the correlation coefficient.

Quick Tip

The correlation coefficient is a normalized measure, making it unaffected by changes in the units or starting point of the data.

---

52. Kepler's laws deal with
(A) Law of orbits
(B) Law of periods
(C) Law of gravitation
(D) Law of areas

Choose the correct answer from the options given below:
(a) (A), (B) and (D) only.
(b) (A), (B) and (C) only.
(c) (B) and (C) only.
(d) (C) and (D) only.

Correct Answer: (a) (A), (B) and (D) only.

Solution: Kepler's laws describe planetary motion, including the shape of orbits, the relationship between the orbital period and distance, and the conservation of angular momentum. The law of gravitation is not part of Kepler's laws but is Newton's law.

Quick Tip

Kepler's laws are fundamental in understanding planetary motion and the dynamics of objects in orbit.

---

53. In order to increase the resolving power of a telescope it is necessary to:
(a) Increase the diameter of the eyepiece
(b) Decrease the diameter of the eyepiece
(c) Increase the diameter of the objective lens
(d) Decrease the diameter of the objective lens

Correct Answer: (c) Increase the diameter of the objective lens.

Solution: The resolving power of a telescope increases with the diameter of the objective lens or mirror, which gathers more light and resolves finer details.

> Quick Tip
>
> Larger objective lenses allow telescopes to collect more light, which improves the resolution and allows the viewing of finer details.

---

54. Match List I with List II

Type of Processes	**Feature**
(A) Adiabatic	(I) Temperature constant
(B) Isochoric	(II) Pressure constant
(C) Isobaric	(III) Volume constant
(D) Isothermal	(IV) No heat flow between the system and surroundings

Choose the correct answer from the options given below:
(a) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
(b) (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
(c) (A) - (IV), (B) - (II), (C) - (I), (D) - (III)
(d) (A) - (IV), (B) - (III), (C) - (II), (D) - (I)

Correct Answer: (d) (A) - (IV), (B) - (III), (C) - (II), (D) - (I).

Solution: - Adiabatic processes have no heat exchange, so no heat flow occurs between the system and surroundings (A - IV).
- Isochoric processes occur at constant volume (B - III).
- Isobaric processes happen at constant pressure (C - II).
- Isothermal processes occur at constant temperature (D - I).

> Quick Tip
>
> The behavior of thermodynamic processes is defined by whether the system exchanges heat or work and whether certain physical properties like pressure or temperature remain constant.

---

55. Match List I with List II

Discontinuity	Boundary location
(A) Moho	(I) Crust and Upper mantle
(B) Repetti	(II) Upper mantle and Lower mantle
(C) Gutenberg	(III) Lower mantle and Outer core
(D) Lehmann	(IV) Outer and Inner core

Choose the correct answer from the options given below:
(a) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
(b) (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
(c) (A) - (I), (B) - (II), (C) - (IV), (D) - (III)
(d) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (a) (A) - (I), (B) - (II), (C) - (III), (D) - (IV).

Solution: - The Mohorovičić discontinuity (Moho) is the boundary between the Earth's crust and the upper mantle (A - I). - The Repetti discontinuity is between the upper and lower mantle (B - II). - The Gutenberg discontinuity is between the lower mantle and outer core (C - III). - The Lehmann discontinuity is between the outer and inner core (D - IV).

Quick Tip

Discontinuities within the Earth's layers provide insight into the structure and composition of the Earth, crucial for understanding seismic waves and mantle dynamics.

---

56. Arrange the following in order of their occurrence starting from land surface to deep ocean.
(A) Abyssal Plains
(B) Continental Rise
(C) Continental Slope
(D) Continental Shelf

Choose the correct answer from the options given below:
(a) (A), (B), (C), (D).
(b) (A), (C), (B), (D).
(c) (D), (C), (B), (A).
(d) (C), (B), (D), (A).

Correct Answer: (c) (D), (C), (B), (A).

Solution: The continental shelf is the shallow area closest to the land, followed by the slope, rise, and finally the abyssal plains which are the deepest areas of the ocean floor.

Quick Tip

The ocean floor features distinct zones from the continental shelf, slope, rise, to the abyssal plains, which are all critical for marine ecosystems.

---

57. In an ocean, Pycnocline refers to a layer representing
(a) Steep change in the density of the ocean
(b) Steep change in the temperature of the ocean
(c) Steep change in the salinity of the ocean
(d) Steep change in the biomass of the ocean

Correct Answer: (a) Steep change in the density of the ocean.

Solution: Pycnocline is a layer in the ocean where the density changes rapidly with depth, primarily due to changes in temperature and salinity. This layer is found between the surface and deep ocean layers.

Quick Tip

The pycnocline is an important layer in oceanography that affects water circulation, nutrient distribution, and marine life.

---

58. The general solution of the differential equation $\frac{dy}{dx} = e^{x-y} + 2x^3e^{-y}$ is (Where C is an arbitrary constant)

(a) $e^y = e^x + x^4 + C$
(b) $e^y = e^x + \frac{x^4}{2} + C$
(c) $e^y = 4e^x + x^3 + C$
(d) $e^y = 4e^x + x^4 + C$

Correct Answer: (a) $e^y = 4e^x + x^4 + C$.

Solution: This is a differential equation that involves both exponential and polynomial terms. The solution can be found by solving the equation for y in terms of x and integrating both sides.

Quick Tip

Differential equations can be solved using separation of variables, integrating factors, or other methods depending on the form of the equation.

---

59. If the order of the differential equation $x^3 \frac{dy}{dx} \frac{dx^2}{2} + 4 + y = 0$ is a, then $2a + 3$ is
(a) 7
(b) 9
(c) 5
(d) 3

Correct Answer: (b) 9.

Solution: The order of the differential equation is determined by the highest derivative with respect to x. In this case, we need to calculate the derivatives and identify the order.

> Quick Tip
>
> The order of a differential equation corresponds to the highest derivative present in the equation.

---

60. $2x \cdot \begin{bmatrix} 4 \\ 7 \end{bmatrix} + 3y \cdot \begin{bmatrix} 1 \\ 2 \end{bmatrix} = \begin{bmatrix} 3 \\ 12 \end{bmatrix}$**, then**
(a) $x = 9, y = -3$
(b) $x = 3, y = 2$
(c) $x = -3, y = 9$
(d) $x = 9, y = -2$

Correct Answer: (c) $x = -3, y = 9$.

Solution: We can solve for x and y by solving the system of equations derived from the matrix multiplication and the given equation. By performing matrix multiplication and solving for x and y, we find the solution $x = -3, y = 9$.

> Quick Tip
>
> To solve matrix equations, break them down into component equations and solve for the unknowns, ensuring each matrix multiplication is correctly performed.

---

61. The value of the determinant

$$\Delta = \begin{vmatrix} 0 & a & -b \\ -a & 0 & -c \\ b & c & 0 \end{vmatrix}$$

is,
(a) $(a + b + c)^2$
(b) $a + b + c$

(c) $(a-b)(b-c)(c-a)$
(d) 0

Correct Answer: (d) 0.

Solution: The determinant of this 3x3 matrix is calculated by expanding it. In this case, the result simplifies to 0 due to the structure of the matrix.

> Quick Tip
>
> For determinants of 3x3 matrices with specific symmetries, such as this one, the result can often simplify to 0.

---

62. Let

$$g(x) = \begin{cases} -3\pi, & -\pi < x \leq 0 \\ 3\pi, & 0 < x < \pi \end{cases}$$

be a periodic function of period 2π. The coefficient of $\sin(3x)$ in the Fourier series expansion of $g(x)$ on the interval $[-\pi, \pi]$ is,
(a) 6
(b) 4
(c) 3π
(d) 4π

Correct Answer: (b) 4.

Solution: The Fourier coefficient of a sine term can be calculated using the Fourier series formula. For this piecewise function, the coefficient of $\sin(3x)$ is found to be 4.

> Quick Tip
>
> The Fourier series can be used to represent periodic functions in terms of sine and cosine terms. The coefficient is determined by integrating over the period of the function.

---

63. The inverse Laplace transform of $\frac{1}{s(s^2+\omega^2)}$ is,
(a) $\frac{\sin(\omega t)}{\omega}$
(b) $\frac{1}{\omega^2}(1-\cos(\omega t))$
(c) $\frac{1}{\omega}(1-\cos(\omega t))$
(d) $\frac{1}{\omega^2}(1-\sin(\omega t))$

Correct Answer: (b) $\frac{1}{\omega^2}(1-\cos(\omega t))$.

Solution: The inverse Laplace transform can be calculated using standard Laplace transform tables and finding the appropriate expression corresponding to the given function. The correct result is $\frac{1}{\omega^2}(1 - \cos(\omega t))$.

Quick Tip

The inverse Laplace transform is useful for solving differential equations and analyzing systems in the time domain.

---

64. If the centre of the circle $x^2 + y^2 - 4x - 8y - 45 = 0$ is (a, b), then the value of $3a + 2b$ is
(a) 3
(b) 7
(c) 26
(d) 14

Correct Answer: (d) 14.

Solution: The center of a circle $(x - h)^2 + (y - k)^2 = r^2$ is (h, k). Completing the square on the equation $x^2+y^2-4x-8y-45 = 0$ gives the center $(2, 4)$, and $3a+2b = 3(2)+2(4) = 14$.

Quick Tip

Completing the square is a standard method for finding the center of a circle from its general equation.

---

65. The real numbers a and b if $(a - ib)(3 + 5i)$ is the conjugate of $-6 - 24i$, are:
(a) $a = 3, b = -3$
(b) $a = -3, b = 3$
(c) $a = 3, b = 2$
(d) $a = 2, b = -3$

Correct Answer: (a) $a = 3, b = -3$.

Solution: The conjugate of a complex number $a + ib$ is $a - ib$. By setting up the equation, we can solve for a and b. The correct values are $a = 3$ and $b = -3$.

Quick Tip

The conjugate of a complex number is found by changing the sign of its imaginary part.

66. If A and B are two sets such that $|A \cup B| = 20$, $|A| = 10$ and $|B| = 17$, then the number of elements in $A \cap B$ is
(a) 5
(b) 7
(c) 3
(d) 2

Correct Answer: (b) 7.

Solution: Using the formula for the union of two sets $|A \cup B| = |A| + |B| - |A \cap B|$, we can solve for $|A \cap B|$. Substituting the given values gives $|A \cap B| = 7$.

> Quick Tip
>
> The number of elements in the intersection of two sets can be found using the formula for the union of sets.

---

67. If $y'' + y' + 5y = 6$, $y(0) = 0$, $y'(0) = 0$, then the Laplace Transformation $Y(s)$ of the solution $y(t)$ of the differential equation is equal to
(a) $\frac{6}{s^2+s+5}$
(b) $\frac{3}{s+(s^2+5)}$
(c) $\frac{6}{s(s^2+s+5)}$
(d) $\frac{5}{s^2 \cdot (s^2+s+5)}$

Correct Answer: (c) $\frac{6}{s(s^2+s+5)}$.

Solution: To solve this using Laplace Transforms, we take the Laplace of each term of the differential equation and solve for $Y(s)$. After applying the initial conditions, the result is $\frac{6}{s(s^2+s+5)}$.

> Quick Tip
>
> Laplace Transforms are useful for converting differential equations into algebraic equations, which are easier to solve.

---

68. Which of the following are statistical techniques for data pre-processing?
(A) Measures of variability
(B) Structured querying
(C) Substring pattern matching
(D) Central tendency

Choose the correct answer from the options given below:
(a) (B) and (C) only
(b) (A) and (C) only
(c) (A), (B), and (D) only
(d) (A) and (D) only

Correct Answer: (d) (A) and (D) only.

Solution: Data pre-processing typically involves statistical techniques such as measures of central tendency (mean, median, mode) and measures of variability (standard deviation, range). Structured querying and substring pattern matching are not commonly used for pre-processing.

Quick Tip

Statistical techniques like central tendency and variability are essential for summarizing and understanding data before further analysis.

---

69. In the context of traditional file systems, which are considered to be the limitations that eventually motivated the emergence of database management systems?
(A) Data redundancy
(B) Data independence
(C) Data inconsistency
(D) Data isolation

Choose the correct answer from the options given below:
(a) (B) and (D) only
(b) (A) and (C) only
(c) (A), (C), and (D) only
(d) (B), (C), and (D) only

Correct Answer: (c) (A), (C), and (D) only.

Solution: Traditional file systems suffer from issues like data redundancy, data inconsistency, and data isolation, which motivated the development of database management systems to provide more efficient and reliable data handling.

Quick Tip

Database management systems address the limitations of traditional file systems by offering better organization, consistency, and reduced redundancy.

---

70. In the given uniform resource locator, correctly identify the domain name.
`https://www.cuet.gov.in/exam/paper.html`
(a) paper.html
(b) www.cuet.gov.in
(c) https://www.cuet.gov.in
(d) gov.in

Correct Answer: (b) www.cuet.gov.in.

Solution: The domain name in the URL is the part that represents the website's address, which is www.cuet.gov.in. This is the server that hosts the page.

Quick Tip

The domain name is part of the URL that specifies the address of the server where the website or resource is hosted.

---

71. Consider the following with respect to a network interface card used for communication.
(a) It is also called an ethernet card
(b) It is an instance of a network router
(c) Data transfer rate is between 10 Mbps to 1 Gbps
(d) Each network interface card is associated with a unique MAC address

Choose the correct answer from the options given below:
(a) (a), (b) and (d) only.
(b) (a), (b) and (c) only.
(c) (b), (c) and (d) only.
(d) (a), (c) and (d) only.

Correct Answer: (d) (a), (c) and (d) only.

Solution: A network interface card (NIC) is also known as an ethernet card, has data transfer rates between 10 Mbps to 1 Gbps, and is associated with a unique MAC address. It is not an instance of a network router.

Quick Tip

The MAC address is unique to each network interface card and serves as an identifier in local network communication.

---

72. Consider the following milestones towards the evolution of networking
(A) Emergence of world wide web (WWW)

(B) Use of TCP/IP as standard network protocol
(C) Launch of ARPANET by UCLA
(D) Introduction of 802.11 communication standard

Choose the correct order of the events from old to recent:
(a) (A), (B), (C), (D)
(b) (C), (B), (A), (D)
(c) (B), (A), (D), (C)
(d) (C), (B), (D), (A)

Correct Answer: (b) (C), (B), (A), (D).

Solution: The correct chronological order of these milestones is:
1. Launch of ARPANET (c),
2. Use of TCP/IP (b),
3. Emergence of WWW (a),
4. Introduction of 802.11 standard (d).

Quick Tip

The development of networking protocols and standards has been crucial for the growth of the internet and wireless communication technologies.

---

73. Which of the following is a valid malware identification method used by antivirus software?
(a) Signature based detection
(b) Iris based detection
(c) Abusive language detection
(d) Copyright violation detection

Correct Answer: (a) Signature based detection.

Solution: Signature-based detection is a method used by antivirus software to identify malware by comparing files to known malware signatures or patterns. Other methods like iris-based detection are not related to malware identification.

Quick Tip

Signature-based detection is one of the most commonly used techniques in antivirus software for identifying malicious files or programs.

---

74. Identify the appropriate file type employed for storing and managing fully

structured data in workstations.
(a) Cascading stylesheet
(b) Rich text format
(c) Comma separated values
(d) Graphics interchange format

Correct Answer: (c) Comma separated values.

Solution: Comma-separated values (CSV) files are widely used for storing and managing structured data, as they store data in tabular form with commas separating the values. Other formats like RTF and GIF are used for text and graphics, respectively.

Quick Tip

CSV files are ideal for representing structured data and are easily readable by various software programs like spreadsheet tools.

---

75. Following are the major stages in the software development life cycle.
(A) Performance Evaluation
(B) Development and Testing
(C) Data Analysis and Design
(D) Implementation Phase

Choose the correct order of the stages from the options given below:
(a) (A), (B), (C), (D)
(b) (C), (B), (D), (A)
(c) (B), (A), (D), (C)
(d) (C), (B), (A), (D)

Correct Answer: (b) (C), (B), (D), (A)

Solution: The correct order of stages in the software development life cycle is: 1. Data Analysis and Design (C)
2. Development and Testing (B)
3. Implementation Phase (D)
4. Performance Evaluation (A)

Quick Tip

In the software development life cycle, the stages are generally followed in this order to ensure that the system is designed, developed, tested, and evaluated efficiently.
