MAH M Arch CET Environment

Sample Paper – 7

Duration: 12 Minutes
Maximum Marks: 20

Instructions

1. This paper contains **10 Multiple Choice Questions (MCQs)**.
2. Each question carries **+2 marks** for a correct answer.
3. There is **no negative marking** for wrong or unattempted answers.
4. Each question has **four options (A, B, C, D)**; choose the **single best** answer.
5. The total time allotted for this section is **12 minutes**.
6. Attempt all questions; do not spend more than 1–2 minutes on any single question.
7. Detailed solutions with full explanations are provided after all questions.
8. Scan the QR code in the footer to access additional sample papers on Collegedunia.

Environment

Q1. On a standard psychrometric chart (dry-bulb temperature on the horizontal axis, humidity ratio on the vertical axis), which of the following statements about **lines of constant wet-bulb temperature** is *correct*?

(A) They are vertical lines parallel to the y-axis, representing a fixed specific humidity (moisture content) of the air.

(B) They are horizontal lines parallel to the x-axis, representing a fixed dry-bulb temperature.

(C) They coincide exactly with lines of constant relative humidity, running from the saturation curve to the dry side of the chart.

(D) They slope diagonally downward from upper-left toward lower-right and run nearly parallel to (but are not identical with) lines of constant enthalpy.

Q2. Which of the following statements **correctly distinguishes** Direct Evaporative Cooling (DEC) from Indirect Evaporative Cooling (IEC) in building-services applications?

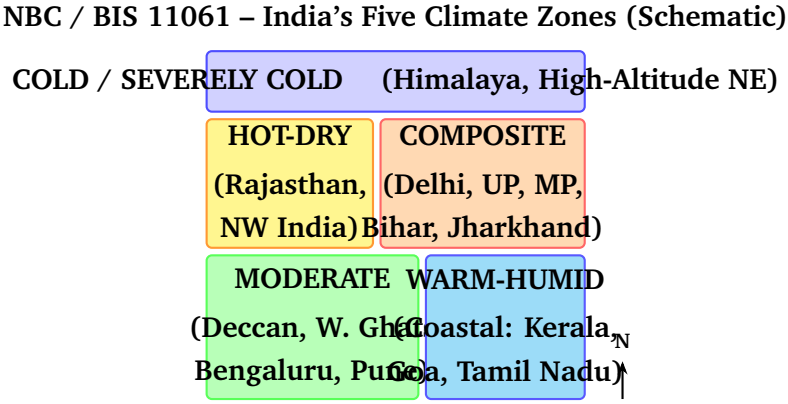
(A) DEC lowers the dry-bulb temperature of supply air *without* adding moisture to it; IEC humidifies the supply air before delivering it to the conditioned space.

(B) DEC adds moisture to the supply air and lowers its dry-bulb temperature along a constant wet-bulb line; IEC cools the primary supply air *without* adding moisture by transferring heat through an exchange surface wetted only on a secondary (exhaust) air side.

(C) Both DEC and IEC add moisture to the supply air, but IEC adds a greater quantity of moisture per unit of cooling delivered.

(D) IEC is applicable only in hot-dry climates, whereas DEC can be used effectively in all climate types including warm-humid conditions.

Q3. As per **BIS 11061** and the **National Building Code of India (NBC)**, the country is classified into five principal climate zones for building-design purposes. The schematic below shows their approximate geographic distribution. Which option correctly lists **all five** climate zone designations used in these standards?



(A) Four zones: Hot-dry, Warm-humid, Composite, and Cold only.

(B) Six zones: Hot-dry, Warm-humid, Composite, Cold, Moderate, and Tropical.

(C) Five zones: Hot-dry, Warm-humid, Composite, Cold (including Severely Cold), and Moderate.

(D) Five zones: Tropical, Sub-tropical, Temperate, Alpine, and Arid.

Q4. Under the criteria established by **Conservation International (CI)**, an area is formally designated a **Biodiversity Hotspot** only when it simultaneously satisfies which **two** quantitative threshold conditions?

(A) It must contain at least **1,500 species of endemic vascular plants**, AND it must have already lost at least **70%** of its original primary habitat (i.e., $\leq$30% of primary vegetation remains).

(B) It must contain more than 5,000 animal species (vertebrates and invertebrates combined), AND at least 50% of its original forest cover must still be intact.

(C) It must be situated in a tropical or subtropical climate zone, AND must harbour at least 10 endemic vertebrate families.

(D) It must exceed 10,000 km^2 of contiguous primary forest, AND must support at least 500 endemic bird species as recognised by BirdLife International.

Q5. The **Montreal Protocol on Substances that Deplete the Ozone Layer** (1987) introduced differentiated obligations for developed and developing countries. Which of the following statements about **India's obligations** as an **Article 5 (developing) country** is *correct*?

(A) India is not a signatory to the Montreal Protocol and therefore has no legally binding phase-out obligations.

(B) India was required to freeze CFC consumption at its 1990 baseline level immediately upon accession to the Protocol in 1992.

(C) The Kigali Amendment mandates India to reduce HCFC consumption to zero by 2020, the same target date that applies to developed (non-Article 5) countries.

(D) As an Article 5 country, India operates under a delayed phase-out schedule: HCFCs were frozen at the 2009–2010 average baseline (effective 2013), with a 10% cut by 2015, 35% by 2020, 67.5% by 2025, and **complete phase-out by 2030** (2.5% service tail permitted until 2040).

Q6. The claim that **biomass combustion** is "**carbon neutral**" is based on which of the following arguments?

(A) Biomass combustion produces no CO_2 at all because all the carbon in plant material is converted exclusively to water vapour during complete oxidation.

(B) The CO_2 released during biomass combustion is part of the **short-cycle biogenic carbon loop**: plants absorb an equivalent quantity of CO_2 from the atmosphere during growth, so the net addition to atmospheric CO_2 over the full growth-harvest-combustion cycle is theoretically zero.

(C) Biomass has a significantly higher energy density than fossil fuels and therefore emits considerably less CO_2 per unit of useful energy produced, making it effectively carbon neutral.

(D) International climate treaties formally classify biomass combustion as a "zero-emission" activity, legally exempting its CO_2 releases from national greenhouse gas inventories.

Q7. **Transit-Oriented Development (TOD)** is a key strategy in contemporary sustainable urban planning. Which of the following **best** defines TOD and identifies its primary sustainability benefit?

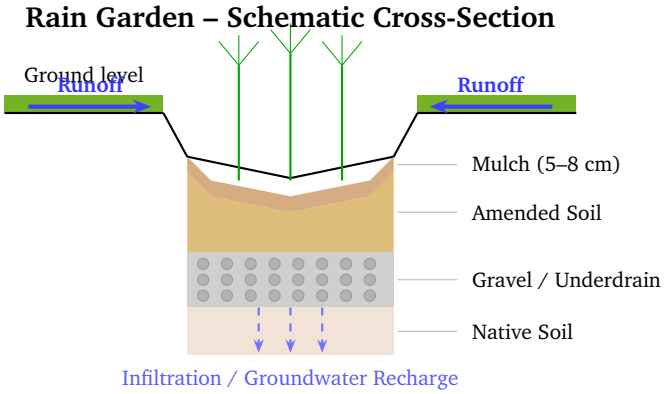
(A) Relocating all major commercial and employment centres to suburban fringe areas served exclusively by Bus Rapid Transit (BRT) corridors, in order to reduce central-city congestion.

(B) Eliminating all vehicular infrastructure within a metropolitan area by mandating that every resident must live within 200 m of a mass-transit stop.

(C) Creating compact, mixed-use, pedestrian-friendly neighbourhoods centred within a **400–800 m walkable radius** of high-capacity transit nodes (metro, BRT, suburban rail), thereby reducing automobile dependence, lowering per-capita emissions, and promoting equitable urban mobility.

(D) Restricting all new residential development to locations *more than* 2 km from any existing transit station in order to distribute population density uniformly and avoid overcrowding near transport hubs.

Q8. A **rain garden** (bioretention cell) is a Sustainable Urban Drainage (SUDS) technique. The cross-section below illustrates its construction layers. Which statement **best** describes the design principle and primary hydrological function of a rain garden?



(A) A rain garden captures roof and surface runoff in a vegetated, shallow bowl underlain by engineered soil media (mulch $\rightarrow$ amended soil $\rightarrow$ gravel), enabling slow biofiltration of pollutants and groundwater recharge through infiltration into the native soil below.

(B) A rain garden is a sealed, raised planter box filled entirely with gravel that stores rainwater in an underground cistern for later irrigation use, with no infiltration into the surrounding ground intended by design.

(C) A rain garden functions primarily as an aesthetic landscape element; its contribution to stormwater management is incidental and is not the basis of any formal engineering design standard.

(D) A rain garden uses a concrete-lined impermeable basin to intercept peak stormwater flow and releases it at a controlled rate through a mechanical outlet valve connected to downstream storm drains.

Q9. Under the **Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008** (as amended in 2016), which of the following **correctly** describes the categorisation across the three Schedules?

(A) Schedule I lists all recyclable wastes that are *exempt* from all regulatory provisions of the Rules and require no authorisation.

(B) Schedule II exclusively covers radioactive wastes originating from nuclear power plants and research reactors.

(C) Schedule III lists wastes that are hazardous *solely* because of their infectious (biomedical) characteristics.

(D) Schedule I identifies wastes from **specific industrial processes and streams**; Schedule II identifies wastes as hazardous based on **concentration thresholds** of defined hazardous constituents; Schedule III lists wastes subject to **Basel Convention transboundary movement** controls.

Q10. **ISO 14001** is the internationally recognised standard for **Environmental Management Systems (EMS)**. Which of the following statements **correctly** describes the ISO 14001 framework?

(A) ISO 14001 prescribes specific numerical emission limits and mandatory environmental performance targets that all certified organisations are legally required to achieve.

(B) ISO 14001 is structured around the **Plan–Do–Check–Act (PDCA)** cycle; it requires organisations to establish an environmental policy, identify significant environmental aspects and impacts, set measurable objectives, implement operational controls, monitor performance, and drive continual improvement of the EMS.

(C) ISO 14001 certification is mandatory under Indian environmental law for all manufacturing industries with an annual turnover exceeding Rs. 500 crore.

(D) ISO 14001 certification replaces the need for compliance with national environmental legislation such as the Environment (Protection) Act, 1986 and the Water (Prevention and Control of Pollution) Act, 1974.

Detailed Solutions

Sol. 1.

Solution

Concept: A psychrometric chart graphically represents the thermodynamic properties of moist air. Key line families include: constant dry-bulb temperature (vertical), constant humidity ratio (horizontal), constant relative humidity (curved), constant wet-bulb temperature (diagonal), and constant enthalpy (diagonal).

Step 1 – Direction of WBT lines: When moist air undergoes adiabatic saturation—water evaporates into the air at constant wet-bulb temperature (WBT)—the dry-bulb temperature (DBT) decreases while the humidity ratio increases. The process path on the chart therefore slopes *downward* from the upper-left (high DBT, low humidity) toward the lower-right (low DBT, higher humidity).

Step 2 – Relationship with enthalpy lines: The enthalpy of humid air is dominated by the sensible and latent heat terms, which track closely with WBT. Consequently, lines of constant WBT and constant enthalpy are nearly parallel across most of the chart. They are, however, *not* identical except at the saturation curve; the small divergence arises from the Lewis number of air deviating slightly from unity.

Why other options are wrong:

- **(A)** Vertical lines represent constant *dry-bulb temperature*, not wet-bulb temperature.
- **(B)** Horizontal lines represent constant *humidity ratio* (specific humidity), not WBT.
- **(C)** WBT lines and relative humidity (RH) curves are entirely different families; they do not coincide.

Final Answer: Option (D) is correct. Lines of constant wet-bulb temperature slope diagonally (upper-left to lower-right) and are nearly parallel to lines of constant enthalpy on the psychrometric chart.

Answer: (D) Go Back to Q1

Sol. 2.

Solution

Concept: Both DEC and IEC exploit evaporative cooling but differ critically in whether the *supply air stream itself* is humidified.

Step 1 – Direct Evaporative Cooling (DEC): Water is evaporated *directly* into the supply air stream (via wet pads, water sprays, or evaporative media). The process is adiabatic: DBT falls while humidity ratio rises, keeping the wet-bulb temperature constant. The air delivered to the space is therefore cooler but *more humid*. DEC is highly effective in hot-dry climates but ineffective in warm-humid climates where the air is already near saturation.

Step 2 – Indirect Evaporative Cooling (IEC): A secondary (exhaust or outdoor) air stream is passed over a wetted surface inside a plate-type or tube-type heat exchanger. This secondary stream evaporates water, cools down, and then exchanges heat with the primary (supply) air stream through the heat-exchange wall. The primary supply air is cooled *without gaining any moisture*—its humidity ratio remains unchanged. This is the defining and critical advantage of IEC, especially in humid climates.

Why other options are wrong:

- **(A)** Exactly reversed: DEC *does* add moisture to supply air; IEC does *not*.
- **(C)** IEC adds *zero* moisture to the primary supply air stream; that is its fundamental design distinction.
- **(D)** IEC has broader applicability in varied climates precisely because it avoids humidification; DEC is specifically *least* effective in warm-humid conditions.

Final Answer: Option (B) is correct. DEC adds moisture to supply air and lowers its DBT; IEC cools the supply air without adding moisture.

Answer: (B) Go Back to Q2

Sol. 3.

Solution

Concept: BIS 11061:1984 (*Guide for Climatic Data for Building Design in India*) and the National Building Code of India 2016 (Part 8, Section 1) together classify India into **five** climate zones for energy-efficient and comfort-based building design.

Step 1 – The five zones and their characteristics:

- **Hot-Dry:** North-west India (Rajasthan, parts of Gujarat, Haryana). Mean monthly max $> 30°$C; relative humidity $< 55\%$ for more than half the year. Design priority: shading, thermal mass, indirect ventilation.
- **Warm-Humid:** Coastal belt (Kerala, Goa, coastal Tamil Nadu, Andaman & Nicobar). Moderate temperatures (25–35°C); high RH ($> 55\%$) year-round. Priority: cross-ventilation, shade, moisture control.
- **Composite:** Central and north-central plains (Delhi NCR, UP, MP, Bihar). Experiences hot-dry summers, warm-humid monsoons, and cool winters in the same year. Requires multi-season strategies.
- **Cold (including Severely Cold):** Himalayan region (J&K, Himachal Pradesh, Uttarakhand, high-altitude NE states). Long harsh winters; short mild summers. Priority: insulation, passive solar heating, airtightness.
- **Moderate:** Southern Deccan Plateau and parts of Western Ghats (Bengaluru, Pune, parts of Karnataka). Mild temperatures (15–30°C) year-round; moderate humidity. Minimal active conditioning needed.

Step 2 – Identifying distractors: "Tropical," "Sub-tropical," "Temperate," and "Alpine" are Köppen or geographic classification terms; they are *not* used in BIS 11061 or NBC.

Why other options are wrong:

- **(A)** Lists only four zones; omits Moderate.
- **(B)** Lists six zones and introduces "Tropical," which is not an NBC climate zone designation.
- **(D)** Uses geographic/Köppen-derived labels not employed in BIS 11061 or NBC.

Final Answer: Option (C) is correct. BIS 11061/NBC recognises five climate zones: Hot-Dry, Warm-Humid, Composite, Cold (including Severely Cold), and Moderate.

Answer: (C) Go Back to Q3

Sol. 4.

Solution

Concept: Conservation International (CI) coined the biodiversity hotspot concept (Norman Myers, 1988; formally refined 1990 and 2000). Designation requires *both* thresholds to be met simultaneously—high biological richness *and* high threat level.

Step 1 – Criterion 1 (Endemism richness): The area must contain at least **1,500 species of vascular plants as strict endemics**—species occurring nowhere else on Earth. This threshold equals $\geq$0.5% of the world's $\approx$300,000 known vascular plant species. Plants are used as the primary metric because they are well-documented globally and structurally define ecosystems.

Step 2 – Criterion 2 (Habitat loss / threat): The area must have lost at least **70% of its original primary native vegetation**, meaning $\leq$30% of primary habitat remains. This ensures that designated hotspots are areas under significant anthropogenic pressure, warranting urgent conservation investment.

Step 3 – India's hotspots: India has components in four of the 36 globally recognised hotspots: (1) Himalaya, (2) Western Ghats & Sri Lanka, (3) Indo-Burma (NE India), and (4) Sundaland (Nicobar Islands).

Why other options are wrong:

- **(B)** CI uses endemic *vascular plant* richness, not total animal species; and 50% habitat remaining implies only 50% loss—far below the $\geq$70% threshold.
- **(C)** Geographic/climatic location is *not* a CI criterion; several temperate hotspots exist (Mediterranean Basin, Caucasus, South African Cape).
- **(D)** Minimum contiguous area and endemic bird-species counts are *not* the defining CI criteria for hotspot designation.

Final Answer: Option (A) is correct. CI hotspot criteria: $\geq$1,500 endemic vascular plant species AND $\geq$70% original primary habitat already lost.

Answer: (A) Go Back to Q4

Sol. 5.

Solution

Concept: The Montreal Protocol (adopted 1987, in force 1989) is the multilateral treaty that phased out CFCs and is phasing out HCFCs (and, via the 2016 Kigali Amendment, HFCs). It establishes differentiated timelines: Article 5 (developing) countries receive a 10-year grace period relative to non-Article 5 (developed) countries.

Step 1 – India's status: India acceded to the Montreal Protocol on 19 June 1992 as an Article 5 Party, entitling it to delayed phase-out schedules for all controlled substances.

Step 2 – HCFC phase-out schedule for Article 5 countries (Decision XIX/6, 2007):

- Baseline: average of 2009 and 2010 HCFC production and consumption.
- **2013:** Freeze at baseline.
- **2015:** 10% reduction from baseline.
- **2020:** 35% reduction.
- **2025:** 67.5% reduction.
- **2030:** Complete phase-out (2.5% service and maintenance exemption permitted until 2040).

By contrast, non-Article 5 (developed) countries had to achieve complete HCFC phase-out by 2020.

Why other options are wrong:

- **(A)** India *is* a signatory since 1992; this statement is factually false.
- **(B)** CFC and HCFC obligations have separate baselines and timelines; a "1990 CFC freeze" schedule does not apply to HCFCs.
- **(C)** The 2020 HCFC phase-out deadline applies to *developed* (non-Article 5) countries; Article 5 countries have a 10-year extension to 2030.

Final Answer: Option (D) is correct. India (Article 5) froze HCFCs at the 2009–2010 baseline from 2013, with stepwise reductions and complete phase-out by 2030.

Answer: (D) Go Back to Q5

Sol. 6.

Solution

Concept: The carbon neutrality claim for biomass rests on the distinction between *biogenic* (short-cycle) carbon and *fossil* (geological long-cycle) carbon, which underpins international energy and climate policy treatment of biomass.

Step 1 – The biogenic carbon cycle: Through photosynthesis, growing plants absorb CO_2 from the atmosphere and fix it as organic carbon in their biomass. When that biomass is harvested and burned, the organic carbon is oxidised back to CO_2 and returned to the atmosphere. Because the residence time of biogenic carbon in plants is measured in *years to decades*—not millions of years as for coal, oil, or gas—the net change in atmospheric CO_2 over one complete growth-harvest-combustion cycle is theoretically zero.

Step 2 – Practical caveats: The carbon-neutrality claim is contested in practice because: (i) forest regrowth may take 20–100 years, creating a transient atmospheric *carbon debt*; (ii) land-use change, harvesting machinery, and transport add fossil-fuel emissions; (iii) soil carbon disturbance during harvest can be significant. IPCC 2006 guidelines treat biogenic CO_2 at the combustion point and credit CO_2 uptake in the LULUCF (land use, land-use change and forestry) sector separately.

Why other options are wrong:

- **(A)** Biomass combustion *does* produce CO_2 (and H_2O, CO, particulates). Only the hydrogen component of organic matter is oxidised to water; the carbon is oxidised to CO_2.
- **(C)** Biomass typically has a *lower* calorific value than fossil fuels (high moisture content, high oxygen content), so CO_2 per unit of energy output is often *higher*, not lower.
- **(D)** No international treaty unconditionally classifies biomass combustion as zero-emission; IPCC inventory guidelines assign biogenic CO_2 at the point of combustion, offset by LULUCF accounting.

Final Answer: Option (B) is correct. The carbon-neutrality argument for biomass rests on the biogenic short cycle: CO_2 released during combustion equals CO_2 previously absorbed during plant growth, giving a theoretically zero net atmospheric addition over the full cycle.

Answer: (B) Go Back to Q6

Sol. 7.

Solution

Concept: Transit-Oriented Development (TOD) was systematised by American urban planner Peter Calthorpe (*The Next American Metropolis*, 1993) and is now embedded in India's National Transit-Oriented Development Policy (MoHUA, 2017), UTTIPEC guidelines (Delhi), and Smart Cities Mission frameworks.

Step 1 – Core definition: TOD concentrates **higher-density, mixed-use development** (residential + commercial + retail + civic) within a **walkable catchment**—typically a 5–10 minute walk, standardised as a 400–800 m radius—around a high-capacity public transport node (metro rail station, BRT terminal, suburban/commuter rail stop).

Step 2 – Urban sustainability benefits:

- Reduced vehicle kilometres travelled (VKT) $\Rightarrow$ lower per-capita GHG and air pollutant emissions.
- Higher transit ridership $\Rightarrow$ improved financial viability of mass rapid transit systems.
- Compact urban form $\Rightarrow$ less greenfield consumption; reduced urban sprawl.
- Walkability and cycling infrastructure $\Rightarrow$ active transport co-benefits for public health.
- Mixed-income and mixed-use zoning $\Rightarrow$ equitable access to employment and services near transit.

Why other options are wrong:

- **(A)** TOD *concentrates* development *around* transit nodes, not in suburban fringe areas remote from the city; and it is not limited to BRT.
- **(B)** The 400–800 m radius is the TOD standard, not 200 m. Eliminating all vehicular infrastructure is not a TOD goal.
- **(D)** Restricting development *away* from transit stations is the direct opposite of TOD principles; it would suppress transit ridership.

Final Answer: Option (C) is correct. TOD creates compact, mixed-use, walkable neighbourhoods within a 400–800 m radius of transit nodes, reducing car dependence and promoting sustainable urban mobility.

Answer: (C) Go Back to Q7

Sol. 8.

Solution

Concept: A rain garden (bioretention cell) is a widely used Low Impact Development (LID) / Sustainable Urban Drainage Systems (SUDS) measure. It manages stormwater runoff *at source*, mitigating the hydrological impacts of urbanisation and impervious surfaces.

Step 1 – Design layers (top to bottom):

(a) **Ponding zone (shallow surface depression, 15–30 cm):** Temporarily ponds incoming runoff from roofs, paved driveways, and roads during storm events.

(b) **Mulch layer (5–8 cm):** Shredded wood mulch retains surface moisture, suppresses weeds, prevents surface erosion, provides initial physical filtration of coarse debris, and sustains soil microbial communities.

(c) **Amended soil media (30–90 cm):** A specified mix (typically ≈50–60% coarse sand, ≈20–30% compost, remainder topsoil) that: (a) supports root systems of planted native/adaptive vegetation; (b) biofiltrates dissolved pollutants (heavy metals, excess nutrients, petroleum hydrocarbons) via adsorption, plant uptake, and microbial decomposition; (c) provides adequate infiltration rate.

(d) **Gravel/drainage layer (± perforated underdrain pipe):** Coarse aggregate collects infiltrated water and drains it laterally; the optional underdrain discharges at reduced flow and pollutant load where native soil permeability is low.

(e) **Native soil:** Receives infiltrated water; natural attenuation removes residual pollutants; groundwater recharge occurs.

Step 2 – Quantified performance: Rain gardens are designed to manage small-to-medium storm events (the "water quality" storm, typically 25 mm/24 hr). Design standards include USEPA Stormwater Best Management Practices, UK CIRIA C753, and CPHEEO Urban Stormwater Management Manual (India).

Why other options are wrong:

- **(B)** A sealed cistern with no infiltration describes a *rainwater harvesting* sump; infiltration into native soil is the defining hydrological function of a rain garden.
- **(C)** Rain garden performance (runoff volume reduction, peak attenuation, TSS and nutrient removal) is rigorously quantified in multiple design standards worldwide; it is not merely aesthetic.

- **(D)** A concrete-lined basin with a mechanical outlet describes a *detention pond*; the absence of an impermeable liner is fundamental to rain garden design and function.

Final Answer: Option (A) is correct. A rain garden captures runoff in a vegetated bowl with engineered mulch–soil–gravel layers for biofiltration and groundwater recharge.

Answer: (A) Go Back to Q8

Sol. 9.

Solution

Concept: The Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008, notified under the Environment (Protection) Act, 1986, and amended substantively in 2016, regulate the entire lifecycle of hazardous waste in India—generation, storage, collection, transport, treatment, and disposal—as well as import/export under the Basel Convention.

Step 1 – Schedule-by-schedule breakdown:

- **Schedule I:** Lists specific *industrial process streams* that generate hazardous waste (e.g., chromium electroplating sludge, chlorinated solvent residues, cyanide-bearing wastes from metal finishing, spent catalysts from petroleum refining, fly ash with hazardous-metal leachate). Hazardousness is determined by *origin and composition*.
- **Schedule II:** Lists wastes classified as hazardous because they exceed specified *concentration thresholds* of defined hazardous constituents (e.g., lead $>$250 mg/kg, total organic halogens above a specified limit, mercury above a threshold). Wastes not on Schedule I may still be regulated if they breach Schedule II limits.
- **Schedule III:** Lists wastes regulated under the **Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal** (1989, ratified by India in 1992). Import or export of these wastes requires Prior Informed Consent (PIC) and authorisation from MoEFCC.

Why other options are wrong:

- **(A)** Schedule I wastes are *fully regulated*: they require authorisation, registered storage, manifest tracking, and disposal at a licensed Treatment, Storage and Disposal Facility (TSDF); they are definitively not exempt.

- **(B)** Radioactive waste is governed by the *Atomic Energy Act, 1962* and Atomic Energy (Safe Disposal of Radioactive Wastes) Rules, 1987; it is explicitly *excluded* from the HW Rules.
- **(C)** Biomedical/infectious waste is regulated under the *Bio-Medical Waste Management Rules, 2016*; Schedule III of the HW Rules covers Basel Convention transboundary movement—not biomedical characteristics.

Final Answer: Option (D) is correct. Schedule I = process-specific hazardous streams; Schedule II = concentration-threshold-based hazardous wastes; Schedule III = Basel Convention transboundary movement wastes.

Answer: (D) Go Back to Q9

Sol. 10.

Solution

Concept: ISO 14001 (current version: ISO 14001:2015) is published by the International Organization for Standardization and specifies requirements for an **Environmental Management System (EMS)**. It is entirely voluntary, internationally applicable, and *process-based*—it sets no specific numerical performance targets.

Step 1 – PDCA cycle applied to ISO 14001:2015:

- **Plan (Clauses 4–6):** Understand the organisation's internal and external context; identify *significant environmental aspects* (elements of activities/products/services that interact with the environment) and their impacts; determine applicable legal/compliance obligations; set *environmental objectives* that are measurable and consistent with the environmental policy.
- **Do (Clause 8):** Implement operational controls, process management, emergency preparedness and response, supplier and contractor engagement, and training/competence programmes to achieve the objectives.
- **Check (Clause 9):** Monitor and measure environmental performance; conduct internal EMS audits; evaluate compliance with legal and other obligations; report results.
- **Act (Clauses 9.3, 10):** Conduct management review; address nonconformities and corrective actions; drive *continual improvement* of both EMS effectiveness and environmental performance.

Step 2 – Key characteristic: ISO 14001 is *outcome-neutral on absolute perfor-*

mance levels—it does not mandate "you must emit less than X tonnes of CO_2"—but it *requires a binding commitment to continual improvement* within the PDCA framework. Legal compliance is a baseline obligation embedded within the standard, not replaced by it.

Why other options are wrong:

- **(A)** ISO 14001 is explicitly process-oriented, not prescriptive of specific emission limits or absolute performance targets; such limits are set by national regulations or sector agreements.
- **(C)** ISO 14001 is a *voluntary* international management standard; no Indian statute mandates its certification for any turnover category.
- **(D)** ISO 14001 Clause 9.1.2 explicitly requires organisations to "evaluate compliance with its compliance obligations"—certification does not replace or provide exemption from any applicable environmental law.

Final Answer: Option (B) is correct. ISO 14001 is structured around the PDCA cycle, requiring policy, significant aspects identification, measurable objectives, operational controls, performance monitoring, and continual improvement.

Answer: (B) Go Back to Q10

Answer Key

Answer Summary (click a question number to jump to its solution):

Q.	Ans.	Q.	Ans.	Q.	Ans.	Q.	Ans.	Q.	Ans.
1	D	2	B	3	C	4	A	5	D
6	B	7	C	8	A	9	D	10	B