

MAH M Arch CET Current Architecture Practice

Sample Paper – 8

Duration: 12 Minutes

Maximum Marks: 20

Instructions

- This paper contains **10 multiple-choice questions (MCQs)**.
- Each question carries **+2 marks** for the correct answer.
- There is **no negative marking**.
- Only **one** option is correct for each question.
- Click on the question number to jump to its solution; click **Go Back** in the solution to return to the question.

SECTION V — CURRENT ARCHITECTURE PRACTICE

Q1. According to **NBC 2016 (Part 1 — Definitions)**, the term “**Floor Area Ratio**” (**FAR**), also referred to as “**Floor Space Index**” (**FSI**), is defined as the:

- (A) Ratio of the net carpet area on all floors to the gross plot area.
- (B) Ratio of the plinth area of the ground floor only to the total road-frontage area of the plot.
- (C) Ratio of the total covered floor area on all floors of a building (including walls and columns, subject to permissible exclusions) to the plot area on which the building stands.
- (D) Ratio of the built-up area of the topmost habitable floor to the plinth area of the ground floor.

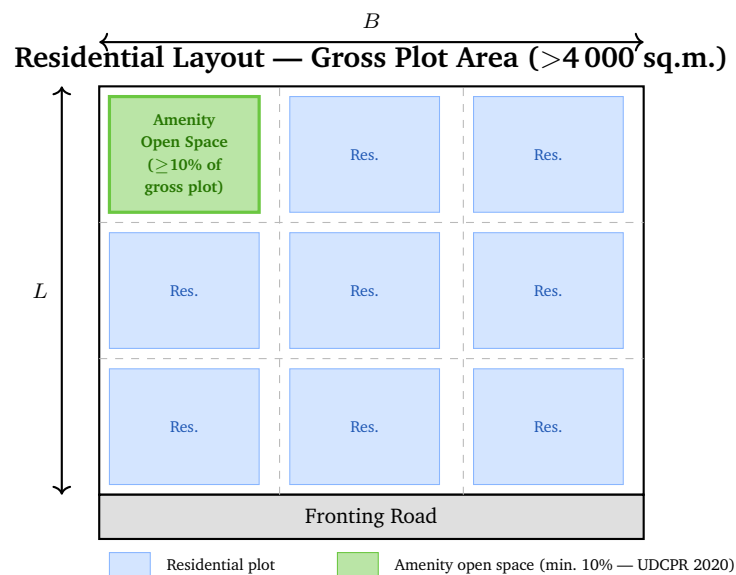
Q2. As per **NBC 2016 Part 4 (Fire and Life Safety)**, which of the following is a *mandatory* requirement for a **protected exit staircase enclosure** in a building whose height exceeds **15 m**?

- (A) The staircase lobby must be mechanically ventilated at not less than 6 air-changes per hour using a dedicated exhaust-only system.
- (B) The enclosure walls and inter-floor slabs of the staircase must achieve a minimum fire-resistance rating of 4 hours.



- (C) A wet riser must be installed at every intermediate floor landing within the staircase enclosure itself.
- (D) The staircase enclosure must be separated from the rest of the building by fire-resistant construction with a minimum **2-hour** fire-resistance rating, and access must be provided through a **self-closing, smoke-sealed fire door**.

Q3. Under **UDCPR 2020**, what is the minimum **recreational (amenity) open space** that must be compulsorily provided in a new **residential layout** where the gross plot area *exceeds* 4,000 sq.m.?



- (A) 5% of the gross plot area.
- (B) 10% of the gross plot area.
- (C) 15% of the gross plot area.
- (D) 20% of the gross plot area.

Q4. As per the **EIA Notification 2006** (Schedule, Item 8b) — the national standard applied alongside **UDCPR 2020** for development proposals in Maharashtra — the minimum total **built-up area (BUA)** above which a new residential or commercial building project *mandatorily* requires prior **Environmental Clearance (EC)** from MoEFCC is:



- (A) 20,000 sq.m. of total built-up area.
- (B) 50,000 sq.m. of total built-up area.
- (C) 1,50,000 sq.m. of total built-up area.
- (D) 5,000 sq.m. of total built-up area.

Q5. Under the **MRTP Act 1966**, which authority is empowered to hear and determine an **appeal** filed by an aggrieved person against an order of the **Planning Authority** (such as a refusal of, or conditions imposed on, development permission)?

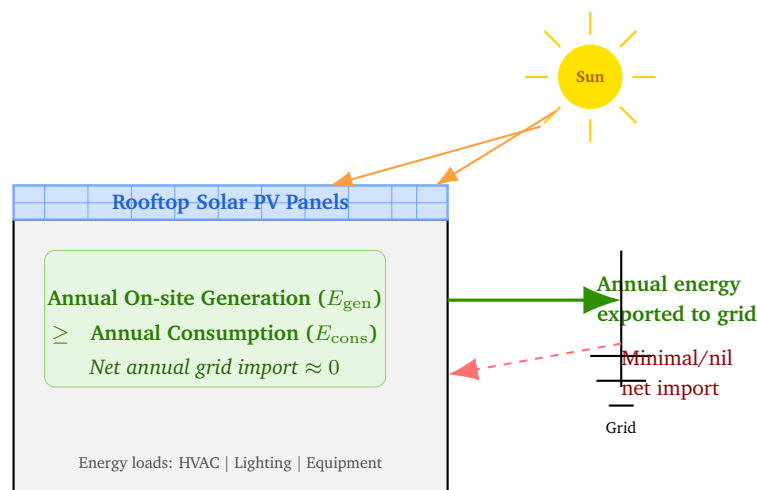
- (A) The Revenue Commissioner of the concerned district, exercising appellate powers under the Maharashtra Land Revenue Code 1966.
- (B) The High Court of the State, directly by filing a writ petition in its original civil jurisdiction.
- (C) The Director of Town Planning, State of Maharashtra, through suo-motu revisional powers under the Act.
- (D) The Divisional Commissioner (or the Appellate Authority designated by the State Government) constituted under the provisions of the MRTP Act 1966.

Q6. **Section 67 of the MRTP Act 1966** enumerates the matters that a **Town Planning Scheme (TPS)** must mandatorily include. Which of the following is **NOT** among the contents mandatorily required under Section 67?

- (A) Reconstitution of original (existing) plots into final plots for the purposes of the scheme.
- (B) Allotment or reservation of land for public purposes, including roads, open spaces, schools, and civic amenities.
- (C) A mandatory comprehensive structural safety audit report and retrofitting programme for all existing buildings within the scheme boundary.
- (D) Provisions for the suspension, modification, or extinguishment of existing rights-of-way, easements, and analogous rights in land within the scheme.



- Q7.** The **Architects Act 1972**, under **Section 20**, provides for registration of persons holding foreign architectural qualifications. On what basis may such a foreign qualification be recognised by the **Council of Architecture (CoA)** for registration in India?
- (A) Any degree titled “Bachelor of Architecture” awarded by a university in any Commonwealth country is automatically recognised without further process.
 - (B) A qualification in architecture granted by an authority in a foreign country that has entered into a **reciprocal agreement** with the Council of Architecture, as notified under **Section 20** of the Architects Act 1972.
 - (C) The Fellow of the American Institute of Architects (FAIA) credential is recognised as a corresponding international professional distinction.
 - (D) Any qualification approved by the International Union of Architects (UIA) in its List of Validated Schools of Architecture is automatically recognised.
- Q8.** Which of the following definitions *best* describes a “**Net Zero Energy Building**” (NZEB) as per the supplementary guidelines issued by the **Bureau of Energy Efficiency (BEE), India**, in support of the **Energy Conservation Building Code (ECBC)**?

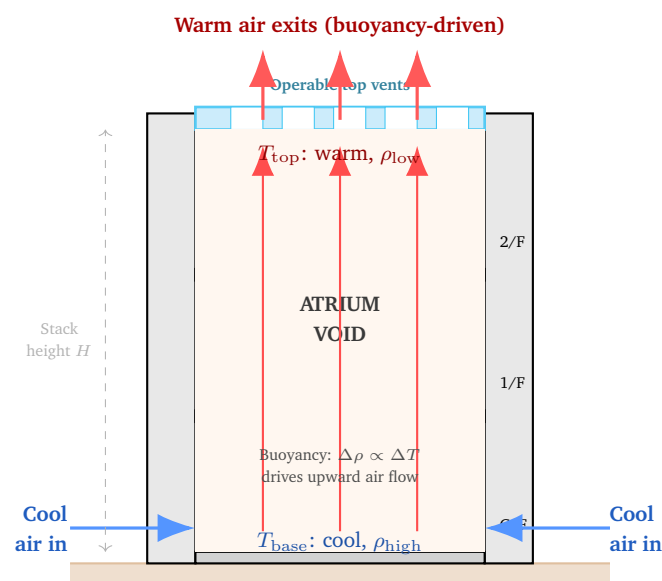


NZEB: annual renewable generation balances total building consumption



- (A) A building that generates all its energy exclusively from rooftop solar PV panels at every hour of the day.
- (B) A building whose instantaneous (real-time) energy drawn from the grid is zero throughout every hour of the year.
- (C) A building that, on an *annual* basis, generates at least as much renewable energy on-site as it consumes from all energy sources, resulting in net zero (or net positive) energy imported from the grid over the year.
- (D) A building that has achieved a minimum 5-Star rating under the BEE Star Label Programme for commercial buildings.

Q9. The “**stack effect**” (thermal buoyancy) exploited in a **double-skin façade** or building **atrium** as a passive natural ventilation strategy is primarily driven by which physical principle?



Section: stack effect (thermal buoyancy) in atrium drives natural ventilation

- (A) The Venturi effect, in which wind speed increases and static pressure drops as air is forced through a narrowed cross-section.
- (B) The Coanda effect, whereby a moving fluid jet tends to adhere to and follow an adjacent curved surface.
- (C) Cross-ventilation driven purely by wind pressure differential between windward and leeward openings at the same floor level.

- (D) The buoyancy difference between warm (less dense) air in the upper zone and cooler (denser) outside air at the base, causing warm air to rise and exit at the top while cooler air is continuously drawn in at the lower level.

Q10. In architectural practice, a **Post-Occupancy Evaluation (POE)** is conducted at which stage of the **building life cycle**?

- (A) After the building has been completed, formally handed over, and occupied by its users for a defined period, in order to assess actual performance against the original design intent.
- (B) During the schematic design stage, before detailed architectural drawings are prepared, to test design assumptions.
- (C) At the time of applying for or receiving the Occupancy Certificate from the local planning authority, as a statutory requirement.
- (D) During the construction supervision phase, immediately before the building is handed over to the client.



SOLUTIONS

Q1.

Solution

Concept: NBC 2016 Part 1 contains standardised definitions applied uniformly across all parts of the Code. “Floor Area Ratio” (FAR) and “Floor Space Index” (FSI) are interchangeable terms used in different states; NBC 2016 harmonises the definition nationally.

Step 1 — Correct definition: As per NBC 2016 Part 1 (Clause 1.4, Definitions), FAR/FSI is defined as *the quotient of the total covered floor area on all floors of a building* (measured to the outer face of external walls, including the area of walls and columns, but excluding areas specifically exempted by the Code — such as certain open terraces, lift shafts, and service ducts) *to the plot area* on which the building stands.

Step 2 — Why other options are wrong:

- (A) “Net carpet area” refers to the habitable floor area excluding walls; it is not the basis for computing FAR.
- (B) Uses road-frontage area as the denominator; no Indian building code uses road frontage in the FAR formula — the plot area is invariably the denominator.
- (D) Comparing the topmost floor area to the ground floor plinth area is not a definition found in NBC 2016 or any recognised Indian building regulation.

Final Answer:

Answer: (C) [Go Back to Q1](#)

Q2.

Solution

Concept: NBC 2016 Part 4 (Fire and Life Safety) prescribes mandatory provisions for protected means of escape. Buildings exceeding 15 m in height require fully protected staircase enclosures to ensure a safe evacuation route free from smoke and fire.

Step 1 — NBC 2016 Part 4 requirement: For buildings of height > 15 m, every exit staircase must be enclosed in fire-resistant construction with a **minimum 2-hour fire-resistance rating** for all surrounding walls, floors and ceiling. Access to the staircase must be only through **self-closing, smoke-sealed fire doors** that prevent smoke from the building from entering the escape route. This ensures the



staircase remains tenable during a fire.

Step 2 — Why other options are wrong:

- (A) NBC 2016 specifies *positive pressurisation* of staircase enclosures (pressurised supply, not exhaust-only) to maintain a smoke-free environment; 6 ACH exhaust-only ventilation is not the stipulated requirement.
- (B) The required fire-resistance rating is **2 hours**, not 4 hours; 4-hour ratings are reserved for specific structural elements and certain shaft/service enclosures in NBC 2016.
- (C) Wet risers are firefighting installations provided on each floor for firefighter hose connections; they are a fire-fighting provision, not a mandatory element *within* the staircase enclosure at every landing.

Final Answer:

Answer: (D) [Go Back to Q2](#)

Q3.

Solution

Concept: UDCPR 2020 (Unified Development Control and Promotion Rules for Maharashtra) mandates that residential layouts above a prescribed size threshold must set aside a minimum proportion of the gross plot area as recreational/amenity open space for residents.

Step 1 — UDCPR 2020 provision: For residential layouts where the gross plot area exceeds 4,000 sq.m., UDCPR 2020 requires a minimum of **10% of the gross plot area** to be reserved as amenity (recreational) open space. This area must be clearly demarcated on the layout plan, free from building construction, accessible to all plot-holders within the layout, and maintained as a landscaped recreational area.

Step 2 — Why other options are wrong:

- (A) 5% is below the UDCPR 2020 minimum for layouts exceeding 4,000 sq.m.; this lower proportion is associated with smaller layouts or different use zones.
- (C) 15% is associated with special zone regulations (hill stations, eco-sensitive zones) and large township schemes, not standard residential layouts under UDCPR 2020.
- (D) 20% applies under certain hill-station development regulations or specific environmentally sensitive area provisions; it is not the standard UDCPR 2020 residential layout requirement.



Final Answer:

Answer: (B) [Go Back to Q3](#)

Q4.

Solution

Concept: The EIA Notification 2006 (MoEFCC, Government of India) classifies projects requiring prior Environmental Clearance (EC). Building and construction projects fall under **Schedule Item 8(b)**, with thresholds based on built-up area.

Step 1 — Item 8(b) threshold: Building and construction projects (residential and commercial) with a total built-up area (BUA) of **20,000 sq.m. and above** require prior EC. Projects between 20,000 sq.m. and 1,50,000 sq.m. BUA are classified as **Category B** (appraised by SEAC/SEIAA at the state level). Projects with $BUA \geq 1,50,000$ sq.m. are **Category A** (appraised by MoEFCC at the central level). Projects below 20,000 sq.m. BUA are generally exempt from mandatory EC under this notification.

Step 2 — Why other options are wrong:

- (B) 50,000 sq.m. is not a regulatory threshold; all projects between 20,000 and 1,50,000 sq.m. uniformly require Category B EC.
- (C) 1,50,000 sq.m. is the boundary between Category A and Category B, not the entry-level threshold for mandatory EC.
- (D) 5,000 sq.m. is well below the notification threshold and is exempt from EC requirements under Item 8(b).

Final Answer:

Answer: (A) [Go Back to Q4](#)

Q5.

Solution

Concept: The MRTP Act 1966 (Maharashtra Regional and Town Planning Act) establishes a statutory hierarchy of planning authorities and provides administrative appellate mechanisms against their orders, prior to any judicial remedy.

Step 1 — Statutory appellate channel under MRTP Act 1966: An aggrieved person may appeal against an order of the Planning Authority (e.g., refusal of development permission, or conditions imposed thereon) to the **Divisional Commissioner** (or such Appellate Authority as the State Government designates under



the Act). This is the first-tier statutory appeal within the Act's own framework, providing a cheaper and faster administrative redress before approaching a court.

Step 2 — Why other options are wrong:

- (A) The Revenue Commissioner operates under the Maharashtra Land Revenue Code; MRTP Act planning appeals follow a separate statutory channel.
- (B) While the High Court is available for extraordinary writ jurisdiction, it is not the *first* statutory appellate forum established within the MRTP Act; the Act provides its own administrative appeal mechanism first.
- (C) The Director of Town Planning has supervisory, advisory, and co-ordinating functions; general first-appeal jurisdiction over Planning Authority development-permission orders does not vest in the DTP under the MRTP Act.

Final Answer:

Answer: (D) [Go Back to Q5](#)

Q6.

Solution

Concept: Section 67 of the MRTP Act 1966 exhaustively lists the mandatory substantive contents of a Town Planning Scheme (TPS). Any item not enumerated in Section 67 is not a statutory requirement for a TPS.

Step 1 — Mandatory contents under Section 67: Section 67 requires a TPS to include provisions for: reconstitution of original plots into final plots; allotment of land for public purposes (roads, open spaces, schools, civic amenities); road layout and widening; water supply, drainage and sewerage; preservation of objects of historical or natural interest; suspension, modification, or extinguishment of existing rights-of-way and easements; and financial/compensation provisions. A **structural safety audit of buildings** within the scheme boundary is **not listed** in Section 67 and is therefore not a mandatory TPS content.

Step 2 — Why other options are wrong:

- (A) Reconstitution of original plots into final plots is *explicitly* and centrally listed in Section 67.
- (B) Reservation of land for public purposes (roads, parks, schools) is a *core* mandatory element of every TPS under Section 67.
- (D) Suspension, modification, or extinguishment of existing easements and rights-of-way are *explicitly* included in Section 67's mandatory list.



Final Answer:

Answer: (C) [Go Back to Q6](#)

Q7.

Solution

Concept: The Architects Act 1972 primarily governs registration of Indian nationals. For foreign nationals, **Section 20** creates a specific mechanism allowing the Council of Architecture (CoA) to enter into formal reciprocal agreements with counterpart bodies in other countries for mutual recognition of architectural qualifications.

Step 1 — Section 20 of the Architects Act 1972: Section 20 empowers the CoA to recognise, by means of a notified **reciprocal agreement** with the competent authority in a foreign country, the architectural qualification granted in that country. The holder of such a recognised foreign qualification may then register with the CoA in India without undertaking the prescribed examination, subject to other applicable conditions. No automatic recognition arises from the name, level, or geographic origin of the qualification alone.

Step 2 — Why other options are wrong:

- (A) Commonwealth membership confers no automatic recognition under the Architects Act 1972; a formal notified reciprocal agreement under Section 20 is mandatory.
- (C) FAIA is a *fellowship* honour conferred on distinguished practitioners; the Architects Act 1972 does not treat fellowship distinctions of foreign institutes as registration qualifications.
- (D) UIA validation of architecture schools is an international accreditation process; it has no automatic legal standing for registration purposes under the Architects Act 1972, which requires a specific Section 20 reciprocal agreement.

Final Answer:

Answer: (B) [Go Back to Q7](#)



Q8.

Solution

Concept: The Bureau of Energy Efficiency (BEE), India, in its supplementary guidelines to the Energy Conservation Building Code (ECBC), defines Net Zero Energy Buildings (NZEBs). The defining characteristic is an *annual* energy accounting boundary and grid-connected operation, not instantaneous or off-grid self-sufficiency.

Step 1 — BEE/ECBC NZEB definition: A Net Zero Energy Building is one that, **on an annual basis**, generates from on-site renewable energy sources (solar PV, solar thermal, biomass, small wind, etc.) at least as much energy as it consumes across all end-uses (HVAC, lighting, plug loads, service loads). The building is typically *grid-connected*: it can import electricity when on-site generation is insufficient (nights, overcast days) and export surplus generation to the grid when generation exceeds demand. The **net energy imported from the grid over the full year is zero or negative** (net exporter), making the annual balance zero.

Step 2 — Why other options are wrong:

- (A) Restricts generation to rooftop solar PV only and to every instant of the day — both conditions are far more stringent than the BEE NZEB definition; other renewables may contribute, and the balance is annual not instantaneous.
- (B) Zero instantaneous grid draw at every hour year-round would require impractical battery storage or going fully off-grid; this describes an “off-grid” building, not the NZEB concept under BEE guidelines.
- (D) The BEE Star Label for commercial buildings rates energy performance using an Energy Performance Index (EPI) in kWh/sq.m./year; a 5-Star rating signifies high efficiency but does *not* define NZEB status.

Final Answer:

Answer: (C) [Go Back to Q8](#)

Q9.

Solution

Concept: Passive natural ventilation strategies exploit fluid physics. The *stack effect* (thermal buoyancy or chimney effect) is a buoyancy-driven phenomenon distinct from wind-driven effects such as cross-ventilation or the Venturi effect.

Step 1 — Physics of the stack effect: Air density decreases as temperature rises ($\rho \propto 1/T$ at constant pressure, from the ideal gas law). Solar gain and internal



heat sources warm the air column within the atrium or double-skin façade cavity. This warm air becomes **less dense than the surrounding outdoor air** and **risks by buoyancy**, exiting through high-level vents. The resulting **pressure deficit at the base** draws **cooler, denser outdoor air in through low-level inlets**. The driving pressure difference is approximately $\Delta P \approx \rho_{\text{out}} g H (\Delta T / T_{\text{out}})$, where H is the stack height and ΔT is the temperature difference between the warm air column and outside air.

Step 2 — Why other options are wrong:

- (A) The Venturi effect occurs when a fluid is constricted, increasing velocity and reducing static pressure; it is a wind-driven aerodynamic phenomenon, not a buoyancy-driven one.
- (B) The Coanda effect describes the tendency of a moving fluid jet to adhere to and follow a nearby curved surface; it does not drive vertical air movement through an atrium.
- (C) Cross-ventilation depends on wind pressure differentials between openings on opposite faces at similar levels; it does not exploit vertical temperature stratification and is entirely distinct from the stack effect in an atrium.

Final Answer: D

Answer: (D) [Go Back to Q9](#)

Q10.

Solution

Concept: A Post-Occupancy Evaluation (POE) is a formal, systematic assessment of a building's performance conducted *after* the building has been built and is in use. It closes the feedback loop between design intent and real-world performance, informing better practice on future projects.

Step 1 — Stage of POE in the building life cycle: POE is conducted **after the building has been completed, formally handed over to the client, and occupied by its intended users for a defined period** — typically from 6 months to 2 years post-occupancy. The evaluation collects data on occupant satisfaction, functional adequacy, indoor environmental quality (thermal comfort, daylighting, acoustics, air quality), energy consumption against design targets, and maintenance performance. Findings feed back into the practice's knowledge base to improve future design decisions.

Step 2 — Why other options are wrong:

- (B) The schematic design stage precedes construction; the building does not



yet exist. Activities at this stage are *design reviews* or *programming appraisals*, not POE.

- (C) Occupancy Certificate is a statutory completion document issued by the planning authority; POE is not a regulatory requirement tied to this milestone, and it requires a period of actual use to yield meaningful performance data.
- (D) Pre-handover checks — snagging, commissioning, and technical completion inspections — verify whether the building was constructed as designed; they do not assess real-world occupant experience or operational performance and are *not* POE.

Final Answer:

Answer: (A) [Go Back to Q10](#)



ANSWER KEY

Q.No	Ans	Q.No	Ans	Q.No	Ans	Q.No	Ans	Q.No	Ans
1	C	2	D	3	B	4	A	5	D
6	C	7	B	8	C	9	D	10	A

All questions are original and based on NBC 2016, UDCPR 2020, MRTP Act 1966, Architects Act 1972, and Green Building/ECBC standards as prescribed for Section V of the MAH M Arch CET.

