

## PG - Architecture - M.Arch. (Sustainable Architecture)

### Exam Pattern

Section	Subject	Questions	Total_Marks	Duration
1	Logical Reasoning, Quantitative Reasoning	40	80	60
2	B.Architecture	60	120	90

### Syllabus

#### Section 1

#### Logical Reasoning

- Reading Comprehension:** Analyze and interpret a variety of reading materials to derive meaning and infer key ideas.
- Identifying Logical Fallacies:** Recognize errors in reasoning, such as false assumptions or flawed arguments.
- Identifying Accurate Conclusions/Assumptions:** Draw logical and sound conclusions from, recognize underlying assumptions in, or derive accurate extensions from a given set of statements.
- Identifying Accurate Examples/Definitions:** Accurately decipher the crux of a statement or argument and recognise appropriate evidence in support of the argument.
- Situation Analysis/Problem Solving:** Synthesise appropriate information to the end of recognizing problems or identifying the best possible solutions to a real-life context.
- Argument/Object Classification:** Recognize patterns in arguments, group similar arguments or statements together, and recognize suitable relationships between material or abstract concepts.

## Quantitative Reasoning

1. **Data Analysis:** Interpret data from graphs, tables, charts and other representations to draw meaningful conclusions.
2. **Commercial Math:** Solve real-world mathematical problems related to trade, profit, and loss.
3. **Visual Reasoning:** Analyze and solve problems involving symmetry, tessellation and patterns.
4. **Algebra:** Apply algebraic concepts to solve equations and inequalities. • **Arithmetic:** Solve fundamental numerical problems involving operations, ratios, and percentages.
5. **Mensuration/Volume:** Calculate areas, perimeters, volumes, and surface areas of geometric shapes.
6. **Complex Problem Solving:** Approach multi-step mathematical problems that require logical and quantitative reasoning.

## Section 2

### 1. Architectural Design

- Principles of design: form, space, order, proportion, and scale
- Design process: conceptualization, development, and detailing
- Contextual design: socio-cultural, historical, and environmental influences
- Urban design principles: spatial organization, streetscape, and public spaces
- Sustainable design practices: passive design strategies, climate-responsive architecture, and green building materials

### 2. Building Construction and Materials

- Building materials: traditional and contemporary materials, their properties, and applications
- Construction techniques: load-bearing structures, RCC, steel, and composite construction
- Advanced construction technologies: prefabrication, modular construction, and 3D printing in architecture
- Building finishes: flooring, roofing, cladding, and glazing systems
- Detailing: joinery, connections, and waterproofing

### 3. Building Services

- HVAC systems: heating, ventilation, air conditioning, and passive cooling
- Electrical systems: wiring, lighting design, and energy-efficient systems
- Plumbing systems: water supply, drainage, and waste management
- Fire safety: detection systems, fire escapes, and suppression systems
- Vertical transportation: elevators, escalators, and ramps

### 4. Structural Systems

- Fundamentals of structural mechanics: force, stress, strain, and moment of inertia
- Types of structures: trusses, arches, shells, domes, and tensile structures
- Structural systems for high-rise buildings and long-span structures
- Analysis of structural stability and load distribution
- Introduction to computational structural analysis and software tools

### 5. Urban and Regional Planning

- Urban planning theories and practices
- Land use planning, zoning regulations, and urban renewal
- Infrastructure planning: transportation, water, and energy systems
- Sustainable urban development: smart cities and urban resilience
- GIS and remote sensing applications in urban planning

### 6. Environmental Studies and Sustainable Design

- Climate-responsive design: thermal comfort, solar shading, and wind analysis
- Renewable energy systems: solar, wind, and geothermal integration
- Water conservation: rainwater harvesting and greywater recycling
- Building rating systems: LEED, GRIHA, and BREEAM
- Life Cycle assessment of materials and carbon footprint analysis

### 7. History of Architecture and Theory

- Ancient architecture: Indus Valley, Egyptian, Greek, and Roman architecture
- Medieval architecture: Byzantine, Romanesque, Gothic, and Islamic architecture
- Renaissance to modern movements: Baroque, Neoclassicism, Bauhaus, and Brutalism
- Contemporary architecture: deconstructivism, parametricism, and biomimicry
- Architectural theory: phenomenology, structuralism, postmodernism, and critical regionalism

## 8. Architectural Graphics and Visualization

- Technical drawing: orthographic projections, isometric views, and sections
- Perspective drawing and rendering techniques
- Architectural visualization software: AutoCAD, SketchUp, Revit, and 3ds Max
- BIM (Building Information Modeling): principles and applications
- Presentation techniques: digital and physical models, and portfolio development

## 9. Research and Professional Practice

- Research methods in architecture: qualitative, quantitative, and mixed methods
- Architectural documentation and report writing
- Codes and standards: NBC, IS codes, and accessibility standards
- Professional ethics and contract management
- Project management: Gantt charts, CPM, and PERT