

Examination Subject
Urban and Architectural
Design

Answer Sheets

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Question 1

- (1) Basilica
- A type of public building used for multipurpose use, including courtrooms, meetings, and commercial transactions in ancient Roman cities. The interior space is usually rectangular plane and surrounded by columns. It became one of the prototypes for later Christian church architecture.
- (2) Sick building syndrome
- Sick building syndrome is a term used to describe symptoms such as fatigue, dizziness, headaches, eczema, sore throats and respiratory illnesses caused by volatile organic compounds (VOCs) in building materials. As a countermeasure, use building materials that emit low levels of VOCs, such as formaldehyde, and ventilate the room at all times to reduce the concentration of VOCs in the room.
- (3) Cooperative house
- Cooperative housing is a housing supply method where multiple prospective residents jointly acquire land and work with a construction company to build housing. The unique feature of this method is that it enables the prospective residents to create a home that reflects their own preferences.
- (4) Carbon negative concrete
- Since a large amount of CO2 is emitted during cement production, this concrete reduces CO2 emissions by replacing some of the cement with blast furnace slag or other materials, or by fixing CO2 in the concrete.
- (5) Nature-based Solutions
- Nature-based Solutions refers to sustainable approaches that utilize the power of nature and ecosystem functions to effectively and adaptively address social challenges such as climate change, disasters, water scarcity, and biodiversity loss. It refers to solutions in harmony with nature, such as forest restoration, wetland conservation, and urban greening.
- (6) Tatsuno Kingo
- Japanese architect. After studying architecture at Imperial College of Engineering he trained future architects at the Imperial University of Tokyo while also operating architectural firms. His masterpieces include the head office of the Bank of Japan and Tokyo Station.
- (7) Chemical weapon
- A chemical weapon is made of toxic chemical substances such as poisonous gases used as weapons. Well-known examples include sarin, mustard, and VX gases, and these gases may be used not only as gases but also by adsorbing them on solids and liquids. Under the Chemical Weapons Convention, the use of chemical weapons in war and similar situations is prohibited. However, in reality, some countries are not signatories to the treaty, and chemical weapons continue to be used. The chemical weapons are also used in terrorist attacks as reported in the news.
- (8) The Limits to Growth
- A report published by the Club of Rome in 1972. Computer simulations showed that if population growth and economic growth continued at the current rate, the supply of food and resources would not keep pace and would come to a standstill, sounding a warning to the world.
- (9) COVID-19
- A new type of coronavirus infection appeared in 2019 is referred to as COVID-19, and the symptoms include high fever and sore throat. Symptoms range from asymptomatic to severe cases, leading to fatal death in the worst case. This infection spread in 2020 and became a pandemic in 2022, but the WHO declared the end of emergency in 2023. However, many cases of infection are still being reported to date.
- (10) Mies van der Rohe
- Architect from Germany. After teaching at the Bauhaus, he moved to the U.S., where he used steel and glass to create universal spaces without limitation of use. His representative works include the National Gallery in Berlin.

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(11) Ecosystem service

Ecosystem services are the benefits humans derive from the natural environment, classified into four categories: provisioning services such as food and water; regulating services such as climate regulation and water purification; cultural services such as recreation and spiritual fulfillment; and supporting services such as nutrient cycling and photosynthesis. These represent important natural capital that supports human well-being and economic activities.

(12) Vibration control of buildings

Vibration control of buildings is a structural system designed to reduce the building's response to earthquakes and strong winds by preventing resonance, adding damping forces, or absorbing input energy from external forces. In this system, dampers and other devices are incorporated into the structural frame, which supports constant loads.

(13) Cross laminated timber (CLT)

A material made by gluing planks of wood together so that the grain runs parallel to each other, then laminating and gluing them together to make the wood grain run at almost right angles to each other, resulting in a structure of three or more layers. The use of this material is growing rapidly in many countries around the world, for example, as large panels for floors and walls in buildings.

(14) Specialization of environmental design

Using a building as an example, in primitive societies, house building itself was done by the dwellers themselves, and any dissatisfaction was to be given up as a limitation of their own abilities. In medieval society, although carpenters and other professionals were established from among those who excelled at house building, there was no significant friction between professional craftsmen and dwellers because of the implicit cultural norms shared about building. Today, as people's values and lifestyles diversify and as the uses of buildings become more specialized, specialists such as architects have emerged, and the gap between specialists and users has become increasingly problematic. Communication between designers and users is therefore becoming increasingly important.

(15) Shinden-zukuri style

It is a type of Japanese residence based on the aristocratic residences of the Heian period. The building layout is centered on the main building (*shinden*) with an open space to the south, surrounded by eastern or western building (*tai*) and *chumonro* corridor. Inside of the building are not partitioned like rooms, but spaces are arranged by movable furniture and partitions.

(16) Park system

Park system refers to a planning method in urban design that connects multiple parks and green spaces into a network using roads, waterways, and greenways. It was developed in 19th century America by landscape architects such as Olmsted and Cleveland. The approach creates a multifunctional green network that improves urban environments, provides recreational opportunities, and preserves ecosystems.

(17) Metabolism (architectural movement)

An architectural movement of the 1960s by young Japanese architects such as Kisho Kurokawa and Kiyonori Kikutake. They advocated that architecture should change like the metabolism of a cell. Part of this movement was realized in the pavilion at the Osaka Expo and the Nakagin Capsule Tower Building.

(18) Curtain wall

A wall that does not have a load-bearing function but is provided to demarcate space. By distinguishing it from the structural framework, it has become possible to build high-rise buildings with all-glass walls.

(19) Area classification system

The Area Classification System is a framework based on Japan's City Planning Act that divides urban planning areas into Urbanization Promotion Areas and Urbanization Control Areas to prevent disorderly urban sprawl. In Urbanization Promotion Areas, development is actively encouraged, while in Urbanization Control Areas, urbanization is restricted. This provides a fundamental mechanism for land use control that promotes planned urban development while preserving natural environments and agricultural land.

(20) World Heritage Convention

It is a Convention adopted by UNESCO in 1972 to protect and preserve cultural and natural heritage of outstanding universal value. Based on the Convention, the sites are registered as World Heritage sites, and international assistance is provided.

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Question 2

Questions in this section aim to test the basic knowledge and understanding of architectural planning and problem-solving skills required for the research in the master's program.

1. This question aims to test the basic knowledge and understanding of housing planning, which is one of the most important research areas in architectural planning. At the same time, it examines the ability to express knowledge in the form of concise sentences.
2. This question aims to test the basic knowledge and understanding of “educational facility planning,” which is one of the important research areas in architectural planning. At the same time, it examines the ability to express knowledge in the form of concise sentences.
3. This question aims to test the basic knowledge of “medical facility planning,” which is one of the important research areas in architectural planning. At the same time, it examines the ability to express knowledge in the form of concise sentences.
4. This question aims to test the basic knowledge and understanding of “space” in architectural planning, and at the same time, to assess the ability to apply it to architectural design.

Question 3

1.
(1) This question aims to test basic knowledge of urban planning necessary for the research in the master's program.

Sample answers

Le Corbusier “Ville contemporaine de trois millions d'habitants”
A plan proposed at the Salon d'Automne held in Paris in 1922. It would later lead to the Voisin Plan and La Ville Radieuse. The plan depicted an ideal modern city with a transportation system of expressways, main roads, and railways in city blocks arranged in a grid, and with a row of skyscrapers surrounded by vast open spaces. This proposal became a model for modern urban planning with the following objectives: 1) to eliminate congestion in the urban center, 2) to increase urban density, 3) to increase means of transportation, and 4) to increase parks and open spaces.

- (2) This question aims to test the analytical and logical skills of urban design necessary for the research in the master's program.
Sample answers

There are a wide variety of correct answers as long as concrete evidence and logical development based on that evidence are provided.

2.
(1) Intent of the question: This question tests basic knowledge about "Modulor" by Le Corbusier, which is one of the important historical examples in architectural design studies. It aims to assess whether the applicants can demonstrate an understanding of the design philosophy of "Modulor" using keywords such as "human body dimensions," "golden ratio," "Fibonacci sequence," "industrialization," and "standardization." It also evaluates the ability of students to express their knowledge in written form.
(2) Intent of the question: The topic of this question is circular design, one of the important recent concepts in architectural design studies. On this topic, this question tests students' knowledge, creativity, and logical thinking ability related to architectural design. Using keywords related to circular design such as "recycling," "3R," "material circulation," "reversible design," and "natural materials," the question intends to assess the students' ability to logically articulate their thoughts on architectural design in written form.

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Question 4

Questions in this section aim to test basic knowledge of architectural environmental planning necessary for the research in the master's program.

- 1. This question tests the basic knowledge of “vision”, one of the most important senses in architectural environmental planning studies. At the same time, the ability to express knowledge in the form of diagrams will be examined.
- 2. This question tests basic knowledge related to the thermal environment, which is important in architectural environmental planning studies. At the same time, it examines the ability to express knowledge in the form of concise sentences.
- 3. This question asks for basic knowledge related to the sound environment, which is important in architectural environmental planning studies. At the same time, it examines the ability to express the details of the knowledge in writing.
- 4. This question tests basic knowledge related to environmental psychology, which is the foundation of architectural environmental planning studies. The ability to express knowledge in the form of concise sentences as well as the ability to apply it to environmental design will be assessed.

Question 5

Intent of the question

This question aims to assess basic knowledge of building construction methods necessary for the research in the master's program.

Example answer:

There are a wide variety of correct answers as long as concrete examples and the correct knowledge and analysis based on the examples are provided.