

INTERVIEW QUESTIONS
for admission into Master's program
*Resources Conservation and Environmental
Safety in Civil Engineering*

08.04.01 Civil Engineering

1. Hydrophysical, physical, thermophysical properties of building materials.
2. Mechanical properties of construction materials. The durability and reliability of construction materials. Factors affecting durability.
3. Methods for determining basic properties of construction materials.
4. Methods of evaluating composition and structure. Relationship between composition, structure and properties of building materials.
5. Natural and artificial materials. Origin classification, properties. Application in civil engineering.
6. Raw materials for production of ceramic bricks. Additives to clay and their role in ceramic bricks production. Ceramic bricks production. The material consumption calculation for ceramic bricks production.
7. Ceramic bricks quality indicators. Ceramic bricks properties. Requirements for ceramic bricks.
8. Silica bricks production. Silica bricks quality indicators. Silica bricks properties.
9. Wall ceramic products. Ceramic products for exterior and interior wall cladding. Ceramic products for special purposes.
10. The structure and properties of glass. Types of glass. Glass products. Mineral melt-based products.
11. Metallic materials and products. The general information. The atomic-crystalline structure of metals. Their mechanical properties.
12. Main types of metals used in civil engineering. Machining and welding of metals. Structural steel.
13. Inorganic binders. The general information. Classification and application. Inorganic binders production.
14. Gypsum binders. The normal consistency and setting time of gypsum. Gypsum properties.
15. Air-setting lime. Hydraulic lime.
16. Cement properties. Ciment fondu and gypsum-alumina cement. High-expansion cement and hardening cement. Parker's cement. Properties and application. Acid-proof cement and nepheline cement.
17. Raw materials for the production of Portland cement. Cement composition. Influence of cement clinker elements on Portland cement properties.
18. Physical and chemical processes of Portland cement burning. Hardening of Portland cement. Portland cement properties. Portland cement corrosion.
19. Portland-slag cement, its properties and application. Portland-Pozzolan cement. Properties and application. Plasticized Portland cement.
20. White and colored Portland cement. Sulphate-resistant Portland cement. Rapid-hardening Portland cement. Portland cement for road surface and airfield pavement.

High-strength Portland cement.

21. Concrete. The classification of concrete. Aggregates for conventional concrete, their properties and requirements for them. Basic requirements for concrete. Concrete strength.
22. Grain composition of coarse and fine aggregates. Concrete mix calculations.
23. Heavy concrete properties. Special types of concrete. Lightweight concrete. Silicate concrete.
24. Reinforced concrete products and their classification. Production of precast concrete products.
25. Water mortar. The general information and ingredients for its production. Water mortar properties. Types of water mortar (mason's mortar, plaster mortar and mounting mortar). Special mortar.
26. Wood materials. The general information. Wood structure and composition. Timber and wood products.
27. Physical and mechanical properties of wood. Durability of wood and ways to improve it.
28. Organic binders. The general information, classification. Bituminous binders. Composition, structure, and properties. Materials based on them.
29. Organic binders. The general information, classification. Tarry binders. Composition, structure, and properties. Materials based on them.
30. Asphalt concrete and mortar. Composition, properties and application.
31. Polymer materials. The general information. Raw materials for their production. Polymer materials properties. Polymers in civil engineering.
32. Composite building materials. The general information. Composition and structure. Properties of composite building materials.
33. Heat-insulating materials. Types, structure and properties.
34. Acoustic materials. The general information. Properties and types.
35. Waterproofing materials. The general information. Properties and types.
36. Coating materials. Anticorrosive protection of structural steel. Materials for anticorrosive protection.