**MATERIALS FOR ENTRANCE EXAMINATIONS IN THE DOCTORATE SCHOOL**

**FOR EDUCATIONAL PROGRAM 8D07201 - METALLURGY**

**FOR THE 2024-2025 ACADEMIC YEAR**

Field of education:

**8D07 Engineering, manufacturing and construction industries**

Code and classification of areas of training:

**8D072 Manufacturing and processing industries**

Group of educational programs:

**D117 Metallurgical Engineering**

**Ticket questions**

***Questions on the second block -***

***50 - for GOP natural-technical direction***

###001 (question number)

Briefly describe the principles of operation of the main equipment used for ore preparation and enrichment

{Block}=2

{Source}= Voskoboynikov V.G. General metallurgy: a textbook for universities. 6th ed., revised. and additional / V.G. Voskoboynikov, V.A. Kudrin, A.M. Yakushev. - M. : ICC "Akademkniga", 2005. - 768 p.

###002 (question number)

The main processes of preparing iron-containing raw materials for melting in an arc steel-smelting furnace

{Block}=2

{Source}= Voskoboynikov V.G. General metallurgy: a textbook for universities. 6th ed., revised. and additional / V.G. Voskoboynikov, V.A. Kudrin, A.M. Yakushev. - M. : ICC "Akademkniga", 2005. - 768 p.

###003 (question number)

The main chemical reactions occurring in cupolas

{Block}=2

{Source}= Voskoboynikov V.G. General metallurgy: a textbook for universities. 6th ed., revised. and additional / V.G. Voskoboynikov, V.A. Kudrin, A.M. Yakushev. - M. : ICC "Akademkniga", 2005. - 768 p.

###004 (question number)

Describe the principle of smelting with Midrex technology

{Block}=2

{Source}= Yusfin Yu. S. Metallurgy of iron / Yu. S. Yusfin, N. F. Pashkov. - M. : Akademkniga, 2007. - 464 p.

###005 (question number)

Describe the principle of smelting using FINMET technology

{Block}=2

{Source}= Yusfin Yu. S. Metallurgy of iron / Yu. S. Yusfin, N. F. Pashkov. - M. : Akademkniga, 2007. - 464 p.

###006 (question number)

Describe the principle of smelting using ITmk3 technology

{Block}=2

{Source}= Yusfin Yu. S. Metallurgy of iron / Yu. S. Yusfin, N. F. Pashkov. - M. : Akademkniga, 2007. - 464 p.

###007 (question number)

Describe the principle of COREX smelting

{Block}=2

{Source}= Yusfin Yu. S. Metallurgy of iron / Yu. S. Yusfin, N. F. Pashkov. - M. : Akademkniga, 2007. - 464 p.

###008 (question number)

Describe the principle of Hismelt smelting

{Block}=2

{Source}= Yusfin Yu. S. Metallurgy of iron / Yu. S. Yusfin, N. F. Pashkov. - M. : Akademkniga, 2007. - 464 p.

###009 (question number)

Describe the Romelt smelting principle

{Block}=2

{Source}= Yusfin Yu. S. Metallurgy of iron / Yu. S. Yusfin, N. F. Pashkov. - M. : Akademkniga, 2007. - 464 p.

###010 (question number)

Describe the main design features of an electric arc furnace for steel making

{Block}=2

{Source}= Kudrin V.A. Theory and technology of steel production: a textbook for universities. - M. : Mir, AST Publishing House LLC, 2003. - 528 p.

###011 (question number)

What are the main operations for finishing alloys in an automatic gearbox (ladle-furnace unit)

{Block}=2

{Source}= Kudrin V.A. Theory and technology of steel production: a textbook for universities. - M. : Mir, AST Publishing House LLC, 2003. - 528 p.

###012 (question number)

The main defects of steel pipe blanks

{Block}=2

{Source} = Danchenko N. S. Technology of pipe production - M .: Intermet Engineering, 2009. - 478 p.

###013 (question number)

Describe the design of reversing rolling mills

{Block}=2

{Source}= Rudskoy A.I., Lunev V.A. Theory and technology of rolling production: Textbook. - St. Petersburg: Nauka, 2015. - 540 p.

###014 (question number)

Describe the design of pilgrim rolling mills

{Block}=2

{Source} = Danchenko N. S. Technology of pipe production - M .: Intermet Engineering, 2009. - 478 p.

###015 (question number)

The main defects of aluminum ingots

{Block}=2

{Source}= Ibragimov A.T., Pak R.V. Aluminum electrometallurgy. Kazakhstan electrolysis plant. - Pavlodar: Press House, 2009. - 262 p.

###016 (question number)

General technology for the production of seamless pipes

{Block}=2

{Source} = Danchenko N. S. Technology of pipe production - M .: Intermet Engineering, 2009. - 478 p.

### 017 (question number)

General technology for the production of rolled grinding balls

{Block} = 2

{Source} = A.P. Grudev Mashkin L.F., Khanin M.I. Rolling production technology - M .: Metallurgy, 1994 .-- 656 p.

### 018 (question number)

Influence of steel casting technology on the structural and chemical heterogeneity of the continuously cast billet. Options for reducing heterogeneity.

{Block} = 2

{Source} = Smirnov A.N., Pilyushenko V.L., Minaev A.A. and others. Processes of continuous casting. - Monograph. - Donetsk: DonNTU, 2002 .-- 536 p.

### 019 (question number)

Pyrometallurgical methods for processing iron-containing sludge from alumina production. Use cases for businesses in Kazakhstan

{Block} = 2

{Source} = Ibragimov A.T., Budon S.V. Development of technology for the production of alumina from bauxite in Kazakhstan. - Pavlodar: House of the press, 2010 .-- 302 p.

### 020 (question number)

Methods for processing steelmaking slag. recycling products.

{Block} = 2

{Source} = Panfilov M.I. and others. Slag processing and waste-free technology in metallurgy. - M .: Metallurgy, 1987.238 p.

### 021 (question number)

Methods for recycled ferrochrome slags. Use cases for businesses in Kazakhstan

{Block} = 2

{Source} = Gasik M.I., Lyakishev M.P., Emlin B.I. Theory and technology for the production of ferroalloys. - Textbook for universities. - M .: Metallurgy, 1988 .-- 784 p.

### 022 (question number)

Methods for disposal of tailings and overburden. Use cases for businesses in Kazakhstan

{Block} = 2

{Source} = V.M. Avdokhin Basics of mineral processing, Concentration processes. - Publishing house of the Moscow State Mining University, Moscow, 2006, 417 p.

### 023 (question number)

A distinctive feature of manganese ores in Kazakhstan. Classification, properties.

{Block} = 2

{Source} = Zhunusov AK, Tolymbekova LB Metallurgical processing of manganese ores from the Tur and Western Kamys deposits. - Monograph. Pavlodar: Kereku. 2016.

### 024 (question number)

Features of manganese ores of the "Tur" deposit. Recycling methods.

{Block} = 2

{Source} = Zhunusov AK, Tolymbekova LB Metallurgical processing of manganese ores from the Tur and Western Kamys deposits. - Monograph. Pavlodar: Kereku. 2016.

### 025 (question number)

Classification of ferroalloy processes

{Block} = 2

{Source} = Lyakishev N.P., Gasik M.I., Dashevsky V.Ya. Metallurgy of ferroalloys. Part 1. Metallurgy of silicon, manganese and chromium alloys: Textbook. Benefit. - M .: MISiS, 2006 .-- 117 p.

### 026 (question number)

High-carbon ferrochrome smelting technology

{Block} = 2

{Source} = Lyakishev N.P., Gasik M.I., Dashevsky V.Ya. Metallurgy of ferroalloys. Part 1. Metallurgy of silicon, manganese and chromium alloys: Textbook. Benefit. - M .: MISiS, 2006 .-- 117 p.

### 027 (question number)

Ferromanganese smelting technology

{Block} = 2

{Source} = Lyakishev N.P., Gasik M.I., Dashevsky V.Ya. Metallurgy of ferroalloys. Part 1. Metallurgy of silicon, manganese and chromium alloys: Textbook. Benefit. - M .: MISiS, 2006 .-- 117 p.

### 028 (question number)

Ferro-silico-manganese smelting technology

{Block} = 2

{Source} = Lyakishev N.P., Gasik M.I., Dashevsky V.Ya. Metallurgy of ferroalloys. Part 1. Metallurgy of silicon, manganese and chromium alloys: Textbook. Benefit. - M .: MISiS, 2006 .-- 117 p.

### 029 (question number)

Ferrosilicon smelting technology

{Block} = 2

{Source} = Lyakishev N.P., Gasik M.I., Dashevsky V.Ya. Metallurgy of ferroalloys. Part 1. Metallurgy of silicon, manganese and chromium alloys: Textbook. Benefit. - M .: MISiS, 2006 .-- 117 p.

### 030 (question number)

Ferro-silico-chromium smelting technology

{Block} = 2

{Source} = Lyakishev N.P., Gasik M.I., Dashevsky V.Ya. Metallurgy of ferroalloys. Part 1. Metallurgy of silicon, manganese and chromium alloys: Textbook. Benefit. - M .: MISiS, 2006 .-- 117 p.

### 031 (question number)

Smelting technology of silicon alloys with aluminum

{Block} = 2

{Source} = Gasik M.I. Theory and technology of electrometallurgy of ferroalloys: Textbook for universities / M.I. Gasik, N.P. Lyakishev. - M .: SP Intermet Engineering, 1999 .-- 764 p.

### 032 (question number)

The technology of agglomeration of iron-containing materials

{Block} = 2

{Source} = Korotich V.I., Frolov Yu.A., Bezdezhsky G.N. Agglomeration of ore materials. - Yekaterinburg: GOU VPO USTU-UPI, 2003. -400 p.

### 033 (question number)

Vacuum induction remelting. Purpose and application.

{Block} = 2

{Source} = V.A. Kudrin Theory and technology of steel production: a textbook for universities. - M.: Mir, LLC "AST Publishing House", 2003. - 528 p.

### 034 (question number)

Treatment of metals and alloys in a ladle with liquid synthetic slags.

{Block} = 2

{Source} = V.A. Kudrin Theory and technology of steel production: a textbook for universities. - M.: Mir, LLC "AST Publishing House", 2003. - 528 p.

### 035 (question number)

The essence of the screening process, the classification of screens and the principle of their operation.

{Block} = 2

{Source} = R.V. Korzhova Raw material base and ore dressing. Tutorial. Part 2 Ore dressing technology. - M .: Moscow State Institute of Steel and Alloys, 2002. - 148 p.

### 036 (question number)

Crushing and grinding process technology.

{Block} = 2

{Source} = R.V. Korzhova Raw material base and ore dressing. Tutorial. Part 2 Ore dressing technology. - M .: Moscow State Institute of Steel and Alloys, 2002. - 148 p.

### 037 (question number)

Purpose and methods of dehydration processes.

{Block} = 2

{Source} = R.V. Korzhova Raw material base and ore dressing. Tutorial. Part 2 Ore dressing technology. - M .: Moscow State Institute of Steel and Alloys, 2002. - 148 p.

### 038 (question number)

Averaging technology for minerals and concentrates.

{Block} = 2

{Source} = R.V. Korzhova Raw material base and ore dressing. Tutorial. Part 2 Ore dressing technology. - M .: Moscow State Institute of Steel and Alloys, 2002. - 148 p.

### 039 (question number)

Carbon electrodes production technology.

{Block} = 2

{Source} = Ibragimov A.T., Pak R.V. Aluminum electrometallurgy. Kazakhstan electrolysis plant. - Pavlodar: House of Press, 2009 .-- 262 p.

### 040 (question number)

Properties of the electrolyte of an aluminum bath.

{Block} = 2

{Source} = Ibragimov A.T., Pak R.V. Aluminum electrometallurgy. Kazakhstan

### 041 (question number)

Influence of various factors on the current efficiency of aluminum.

{Block} = 2

{Source} = Ibragimov A.T., Pak R.V. Aluminum electrometallurgy. Kazakhstan electrolysis plant. - Pavlodar: House of Press, 2009 .-- 262 p.

### 042 (question number)

The influence of the addition of salts and impurities in the electrolyte on the process of aluminum electrolysis.

{Block} = 2

{Source} = Ibragimov A.T., Pak R.V. Aluminum electrometallurgy. Kazakhstan electrolysis plant. - Pavlodar: House of Press, 2009 .-- 262 p.

### 043 (question number)

Refining of aluminum in the electrolysis process.

{Block} = 2

{Source} = Ibragimov A.T., Pak R.V. Aluminum electrometallurgy. Kazakhstan electrolysis plant. - Pavlodar: House of Press, 2009 .-- 262 p.

### 044 (question number)

The main processes and methods of recycling materials by pressure.

{Block} = 2

{Source} = Technology of rolling production. Mashekov S.A., Kuzminov I.I., Absadykov B.N. and others - Almaty: Tetaprint, 2007.- 334 p.

### 045 (question number)

Heating metal before pressure treatment

{Block} = 2

{Source} = Technology of rolling production. Mashekov S.A., Kuzminov I.I., Absadykov B.N. and others - Almaty: Tetaprint, 2007.- 334 p.

### 046 (question number)

Technological foundations of the metal drawing process.

{Block} = 2

{Source} = Technology of rolling production. Mashekov S.A., Kuzminov I.I., Absadykov B.N. and others - Almaty: Tetaprint, 2007.- 334 p.

### 047 (question number)

Heat treatment technology for rolled products and pipes.

{Block} = 2

{Source} = Technology of rolling production. Mashekov S.A., Kuzminov I.I., Absadykov B.N. and others - Almaty: Tetaprint, 2007.- 334 p.

### 048 (question number)

Calibration of rolls.

{Block} = 2

{Source} = Technology of rolling production. Mashekov S.A., Kuzminov I.I., Absadykov B.N. and others - Almaty: Tetaprint, 2007.- 334 p.

### 049 (question number)

Extraction of precious metals from polymetallic ores.

{Block} = 2

{Source} = Sevryukov N.N. General metallurgy / N.N. Sevryukov, B.A. Kuzmin, E.V. Chelishchev. - M .: Metallurgy, 1976 .-- 568 p.

### 050 (question number)

Recycling of aluminum production waste.

{Block} = 2

{Source} = Panfilov M.I. and others. Slag processing and waste-free technology in metallurgy. - M .: Metallurgy, 1987.238 p.