

Mining:

1) Hydraulic backfilling is used for:

- a) Supplying the appropriate amount of water to the working face
- b) Drainage of excess water from workings with high water level
- c) Filling post-exploitation voids
- d) Leveling the surface of the excavation floor

2) Expansion rock bolt support of mining underground excavations is:

- a) Support with the so-called point embedment
- b) Support with the so-called continuous embedment
- c) Support intended only for suspending auxiliary devices
- d) Support that may only be used in ore mines.

3) The mining of zinc and lead ore deposits in underground mines is carried out mainly by means of:

- a) Blasting technique
- b) Mining roadheader
- c) Plough
- d) Mining longwall complexes

4) Rare earth elements (metals) are as follows:

- a) Which mined in a very low density of the rock mass
- b) The particles of which are dispersed in the earth's crust, which increases the cost and extends the output time
- c) The density of which is very low, which makes it difficult to exploit the deposits
- d) The occurrence of which has not been found so far

5) Access a deposit available for underground mining requires:

- a) Execution of at least one access excavation
- b) Execution of at least two access excavations
- c) Execution of at least access excavations
- d) Execution of at least access excavations

6) The rock raw material is not:

- a) Dolomites
- b) Glass sands
- c) Magnesites
- d) Barites

7) Sandstone is a rock:

- a) Deep magma
- b) Effusive magma
- c) Metamorphic
- d) Sedimentary

8) If the height and width of the slope in an opencast mine are 45 meters, the general slope gradient is:

- a) 1:1
- b) 1:2
- c) 100%
- d) 1%

9) The general slope of the slope does not depend on:

- a) The widths of the level/bench
- b) The slope angle
- c) Slope heights
- d) Type of excavation

10) The bulk density of the useful mineral in the loosened state compared to the bulk density in the undisturbed soil is:

- a) The same

- b) Always greater
- c) Smaller
- d) Usually larger

11) The mechanical workability of compact rocks is determined by:

- a) Parameters of rocks and rock mass
- b) Parameters of mining machines
- c) Technological parameters of work
- d) Weather conditions

Mining Aerology

9. Calculate the amount of methane emitted from mined coal with the mass of 1000 Mg and the methane content of $10 \text{ m}^3/\text{Mg}_{\text{CSW}}$:

- a) 700 m^3
- b) 600 m^3
- c) 1000 m^3
- d) 800 m^3

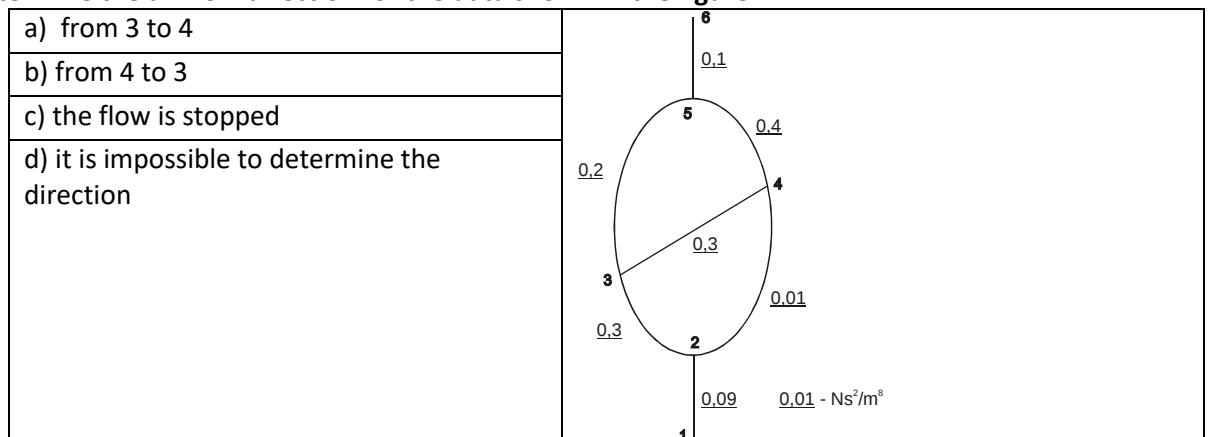
10. The resistance of the excavation for the data: length 1000m, dimensions of the excavation 4x5 m, excavation resistance coefficient $0,01 \text{Ns}^2\text{m}^{-4}$ is:

- a) $0,0225 \text{ Ns}^2\text{m}^{-8}$
- b) $0,0325 \text{ Ns}^2\text{m}^{-8}$
- c) $0,0295 \text{ Ns}^2\text{m}^{-8}$
- d) $0,0225 \text{ kgm}^{-7}$

17. What is the rock mass methane drainage technology:

- a) Creating a reduced pressure zone around the methane drainage holes
- b) Pushing out of the methane rock mass by creating increased pressure
- c) On rock fracture around the excavation
- d) Forcing water into the rock mass

19. Determine the air flow direction for the data shown in the figure:



20. What ventilation system of the preparatory excavations can be used when driving a excavation with a roadheader:

- a) Combined with the main pressure airduct
- b) Combined with the main suction air-duct with a dedusting device
- c) With forcing air-duct
- d) With a suction air-duct with a dedusting device

21. What is the pressure increase of the fan after mixing its revolutions twice, if, before reducing the revolutions, the stagnation was 2000 Pa:

- a) 500 Pa
- b) 1000 Pa
- c) 4000 Pa
- d) 1500 Pa

24. To what methane content can blasting with explosives be carried out:

- a) 1.5%
- b) 2.0%
- c) 1.0%
- d) 0.5%

26. The explosion limits of methane in mining excavations is:

- a) 2-20%
- b) 5-15%
- c) 2-9%
- d) 12.5-72%

28. Regulation of the ventilation net consists in:

- a) Determination of the directions of air flow
- b) Determination of the air distribution in the net
- c) Determination of the total resistance of the system and the equivalent hole
- d) Determination of the pressure increase of the fan and elements regulating the air flow.

29. Solutions of the ventilation net consist in:

- a) Determination of the parameters of the fan and elements regulating the air flow
- b) Designation of places for setting up regulatory dams
- c) Determination of the size of the control windows
- d) Determination of the natural or quantitative air distribution in the net, flow directions, resistance and hole equivalent to the resultant system.

31. The fan operating point is:

- a) The point of intersection of the pressure increase characteristics of the fan and the ventilation net
- b) The point of intersection of the fan pressure increase characteristics and the fan efficiency
- c) The point of intersection of the fan pressure increase characteristics and the power consumed by the engine
- d) The point of intersection of the characteristics of the ventilation net and efficiency

32. The stream of air supplied to the mine should:

- a) Ensure methane dilution to limit values
- b) Ensure the proper air temperature in the excavation
- c) Ensure the minimum air velocity in the excavation
- d) Ensure the greatest efficiency of methane drainage.

34. The air temperature gradient is:

- a) Change in air temperature with a change in depth
- b) Change of rock mass temperature with changes in depth
- c) Change in air temperature as a result of its heating from various heat sources
- d) Change in air temperature as a result of pressure reduction.

35. The air split of the ventilation net is:

- a) Connection of two nodes
- b) Length of the longwall face
- c) Roadway below the longwall face
- d) Distance between inlet and outlet of the function room.

36. Heat depression depends on:

- a) Heat exchange between the air and the rock mass in inclined excavations
- b) Depth changes
- c) Additional heat sources in the excavation
- d) Fan parameters.

The technique of underground mining of deposits

The longwall mining method belongs to the following methods:

- a) Block
- b) Shortwall

- c) Rooms
- d) Open-end

The exploitation longwall can run over faults:

- a) Local
- b) Local side
- c) Seam
- d) Regional

The selection of deposits for three layers with collapsed roof begins with:

- a) Middle layer
- b) Bottom layer
- c) Top layer
- d) It is irrelevant

In the longwall panel from the field:

- a) The transport rout of output becomes longer
- b) The transport rout of output is shortened
- c) Fresh air runs along the goafs of the longwall face
- d) Fresh air runs along the coal body of the exploited longwall face and the rout of the output becomes longer

In the large room and pillar mining method, the width of the rooms is:

- a) From 10 m to 20 m
- b) Up to 5 m
- c) Over 30 m
- d) From 5 to 10 m

The longwall mining is a method in which the length of the face is:

- a) Up to 50 m
- b) From 250 m to 350 m
- c) From 50 m to 350 m
- d) Minimum 150 m

The terrain surface deformation coefficients are calculated knowing:

- a) Deposit thickness, deposit depth, exploitation factor "a", angle β
- b) Deposit thickness, max deposit depth, exploitation factor
- c) Deposit thickness, deposit depth, angle β
- d) Goaf liquidation method and depth of exploitation

The load capacity of the string bolts of 280 kN means that:

- a) Bolt capacity is 28 tons
- b) The bolt load capacity is 2.8 tons
- c) The bolt load capacity is 2800 MPa
- d) The bolt load capacity is 0.28 tons

The initial load capacity of the arch steel yielding support is understood as:

- a) Strengthening of the support by building an additional supporting stand in the axis of the excavation
- b) The initial pressure of the rock mass on the support immediately after its installation
- c) The moment of support deformation during its loading
- d) The pressure of the support to the roof during its installation

The preliminary support of a roadway excavation is a support that:

- a) It is disassembled after the final support is made
- b) Is part of the final support
- c) It protects the longwall excavation in front of the longwall
- d) Protects the longwall excavation at the crossing with the longwall

Blasting technique

1. Blasting materials are:

- a) Articles filled with an explosive material
- b) Explosives
- c) Igniter
- d) Blasting line

2. Secondary initiating materials are:

- a) Lead azide and teneres
- b) Tentrite and hexogen
- c) Mercury fulminate
- d) TNT

3. Electric blasting equipment includes:

- a) Electric cables (blasting lines)
- b) Electric and electronic igniters
- c) Electric igniters
- d) Blasting line insulators and quick couplings

4. During blasting in long vertical blasting holes, the rock fragments dispersion zone around the place of blasting works is:

- a) 250 m
- b) 300 m
- c) 200 m
- d) 400 m

5. Audible warning signals during the execution of blasting works are:

- a) 1 continuous beep, 2 continuous beeps, 1 short beep, 3 continuous beeps
- b) 1 continuous beep, 3 short beeps, 1 short beep, 2 continuous beeps
- c) 3 short beeps, 2 short beeps, 1 short beep, 3 continuous beeps
- d) 2 continuous beeps, 3 short beeps, 1 short beep, 3 continuous beeps

6. The actual range of seismic vibrations is determined by:

- a) President of the State Mining Authority
- b) Manager of the Mining Plant Operations
- c) Director of the District Mining Office
- d) Appraiser

7. Prevention in terms of the impact of blasting works on the environment includes:

- a) Documenting the impact
- b) Determination of the propagation equation
- c) conducting blasting works on windless days
- d) Basic research

8. Factors influencing the intensity of vibrations are:

- a) Weather conditions during the execution of blasting works
- b) Distance of the measuring point from the source of vibration
- c) Construction of the ground under the protected buildings
- d) Mass of the explosive charge per a single inter-shot delay and in a series of holes

9. Cumulative blasting charges may be used for:

- a) Breaking oversized rock blocks
- b) Cutting steel
- c) Plate plating
- d) obtaining rock blocks

10. Under what conditions blasting may not be carried out:

- a) Thunderstorm
- b) Strong wind
- c) At temperatures exceeding 300C°
- d) Heavy rain

11. Dynamite is an explosive, the basic ingredient of which, used in its production, may be:

- a) TNT
- b) Nitroglycol
- c) Hexogen
- d) Nitroglycerin

12. Black powder is an explosive:

- a) Belonging to the rock group, loose subgroups
- b) Belonging to the rock group, the subgroup granular and granular
- c) Chrysanthemum
- d) For the production of which potassium nitrate is used

13. Which of the following chemical compounds is not an oxidant

- a) Sodium nitrate
- b) Polyethylene (PE)
- c) Nitrocellulose
- d) Sodium nitrate

14. The ingredient used to sensitize MW is:

- a) Shooting cotton
- b) Nitroglycol
- c) Aluminum
- d) Diesel fuel

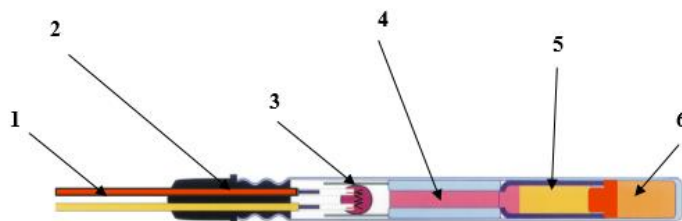
15. Trial by Trauzel:

- a) Is a test of the ability to work in a steel block
- b) Is a lead block ability test
- c) Requires the use of a reference explosive which is pentrite for testing
- d) Requires the use of a reference explosive which is mercury fulminate

16. Primary explosives are:

- a) Lead azide
- b) Hexogen
- c) Mercury fulminate
- d) Pentrite

17. Please indicate the true statements:



- a) The diagram shown shows the structure of a non-electric detonator
- b) The element marked with number 4 in the diagram is a sleeve containing a delay pyrotechnic mixture
- c) The element marked with number 5 in the diagram is a secondary explosive - pentrite
- d) The element marked with number 6 in the diagram is a primary explosive - lead azide

18. The term "initiating measures" means:

- a) Electric detonators
- b) Explosives
- c) Detonating cords
- d) Explosive boosters

Geomechanics

1. Which parameters allow to calculate the theoretical value of the vertical primary stresses in the rock mass?

- a) Modulus of elasticity and Poisson's ratio
- b) The depth of the layers and the modulus of elasticity
- c) Rock density and depth of layers
- d) Rock density and Poisson's ratio

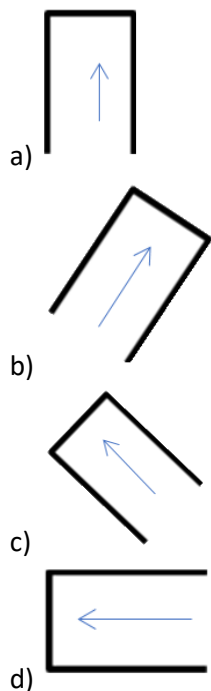
2. What factors influence the horizontal primary stresses in the compact rock mass?

- a) Primary vertical stresses and modulus of elasticity
- b) Rock density and depth of layers
- c) Modulus of elasticity and Poisson's ratio
- d) Tectonic involvement, Poisson's ratio, primary vertical stresses

3. Lithostatic stresses are:

- a) Stresses in the tectonically undeformed rock mass resting on continental plates
- b) Local stress, depending on the morphology of the terrain
- c) Stresses at a given depth equal to the magnitude of the gravitational stress
- d) Stresses in areas of complex geological structure

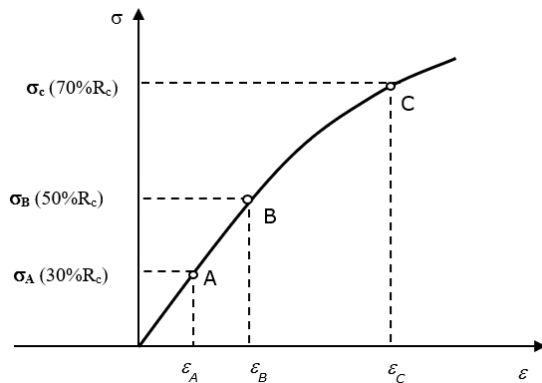
4. At different values of horizontal stresses (e.g. $p_x > p_y$), the most favorable direction of excavation of the excavation will take place in relation to the horizontal direction x:



5. The strength values for one particular rock can usually be arranged as follows (R_c – compressive strength; R_t – shear strength; R_g – bending strength; R_r – tensile strength):

- a) $R_c > R_t > R_g > R_r$
- b) $R_c > R_g > R_t > R_r$
- c) $R_c > R_t > R_r > R_g$
- d) $R_c > R_g > R_r > R_t$

6. The modulus of elasticity for rocks for elastic deformations can be determined according to the formula (R_c – compressive strength):



a) $E_C = \frac{\sigma_C}{\varepsilon_C}$

b) $E_{BA} = \frac{\sigma_B - \sigma_A}{\varepsilon_B - \varepsilon_A}$

c) $E_{CB} = \frac{\sigma_C - \sigma_B}{\varepsilon_C - \varepsilon_B}$

d) $E_{CA} = \frac{\sigma_C - \sigma_A}{\varepsilon_C - \varepsilon_A}$

7. The matrix below defines:

$$T_n^o = \begin{vmatrix} \sigma_{sr} & 0 & 0 \\ 0 & \sigma_{sr} & 0 \\ 0 & 0 & \sigma_{sr} \end{vmatrix}$$

- a) Stress deviator
- b) Average stresses
- c) Stress axiom
- d) Reduced stresses

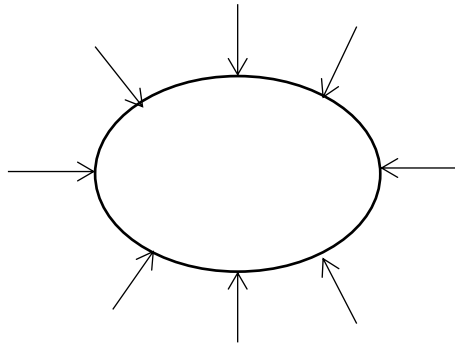
8. Concentrations of vertical stresses around the excavation occur:

- a) In the roof
- b) On the floor
- c) In the sidewalls
- d) In the roof, floor and sidewalls

9. For which values of the lateral expansion coefficient, the values of secondary stresses around the circular excavation made in the undisturbed rock mass will assume compressive values along the entire circumference:

- a) Lateral expansion coefficient less than 0.33
- b) Lateral expansion coefficient greater than 0.33
- c) Lateral expansion coefficient less than 0.25
- d) Lateral expansion coefficient greater than 0.25

10. Secondary radial stresses on the contour of an unsupported excavation take the following values:



- a) Positive
- b) Zero
- c) Negative
- d) Positive and negative

11. Knowing the width of the excavation equal to 6 m and the RMR index = 40, what is the projected value of the extent of the rock fracture zone in the roof:

- a) 1.0 m
- b) 2.4 m
- c) 3.6 m
- d) 1.2 m

12. The value of the RQD index for individual sections of the core with a diameter of 50 mm is (the length of the slots is equal to 1 m):



- a) 0% and 70%
- b) 10% and 50%
- c) 0% and 85%
- d) 15% and 65%

13. The basic parameters of the Coulomb Mohr failure criterion are:

- a) Young's modulus, Poisson's ratio and uniaxial compression strength
- b) Young's modulus, cohesion (cohesion) and uniaxial compressive strength
- c) tensile strength and uniaxial compressive strength
- d) cohesion and internal friction angle

14. What parameters does the RMR Bieniawski classification include?

- a) Spacing of discontinuities, compressive strength, tensile strength, depth, ground water
- b) Ground water, RQD, spacing of discontinuities, conditions of discontinuities, compressive strength
- c) Spacing of discontinuities, RQD, tensile strength, depth, ground water
- d) Ground water, RQD, Spacing of discontinuities, conditions of discontinuities, slakeability of rocks

15. What number of points in the Bieniawski RMR classification can be assigned to the RQD index?

- a) 15
- b) 30
- c) 25
- d) 20

16. The RQD indicator is determined on the basis of:

- a) Analysis of the drill core
- b) Compressive strength of the rock
- c) Rock mass quality
- d) Spacing of the rock mass discontinuities in the face of the excavation

17. What rocks are most susceptible to weakening as a result of the influence of water:

- a) Limestone
- b) Sandstone
- c) Clayey
- d) Granites

18. During the operation, the highest stress concentrations occur in:

- a) In the forehead
- b) In goaf
- c) Over the mining excavation
- d) Zones of concentration change their location and cannot be predicted in advance

19. The cooperation of bonded rock bolts with the rock mass is related to:

- a) With adhesion of the binder to the bolt and rock
- b) With the adhesion of the binder to the bolt rod and rock and friction at the bolt rod-binder contact
- c) With friction at the bolt rod-binder contact
- d) Depends on the properties of the rocks to which it is installed

20. What is the key factor in assessing the quality of a rock mass?

- a) Its durability
- b) Its deformability
- c) Size and nature of the cracks
- d) Pressure of inlet water

21. Which rock mass classifications are most often used to evaluate the properties of the rock mass in mines?

- a) Barton Q and Terzaghi
- b) Hoek GSI and Bieniawski RMR
- c) Terzaghi and Bieniawski RMR
- d) Palstrom Rmi and Barton Q

22. Resilient resistance of the support:

- a) Is advantageous because it allows you to use the full margin of the support load capacity
- b) Is disadvantageous as it increases the local stress in the support
- c) Is disadvantageous as it does not allow the support to be yielded
- d) Is advantageous in that it relieves the support

23. After the roadway excavation is completed, the following zones may arise around it:

- a) Destruction, plastic and elastic
- b) Plastic and elastic
- c) Only elastic
- d) All three cases can occur

24. The rock bolt support may not be used in rocks:

- a) weak with low strength
- b) very strong and concise
- c) which become soaked by the action of water
- d) cracked

25. The amount of ground surface subsidence caused by mining operations of a g-thickness layer depends on:

- a) Exploitation factor depending on the method of controlling the roof
- b) Strength of the overburden rocks
- c) The thickness of the overburden

d) Local mining and geological conditions

26. Which of the phenomena is not a manifestation of the dynamic pressures of the rock mass:

- a) Relaxation
- b) Ejection of gases and rocks
- c) Uplift of the floor
- d) Sudden roof fall

Natural hazards in mining

1. Due to the nature of occurrence, natural hazards are divided into:

- a) Underground, opencast and borehole
- b) Atmospheric, geological and hydrological
- c) Ventilation, geomechanical, gasogeomechanical and hydrological
- d) Catastrophic and non-catastrophic

2. In hard coal mining, the risks increase with the depth of mining:

- a) Hydrogen sulphide, water, radiation
- b) Methane, climate and water
- c) Climatic, rock bursts and water
- d) Methane, climate and rock bursts

3. Exploitation in the area of tectonic disturbances increases the risk of:

- a) Coal dust explosion
- b) Gas and rock outbursts
- c) Climatic
- d) Hydrogen sulfide

4. Concentration of hard coal mining is not conducive to reducing the risks of:

- a) Methane gas, coal dust explosion and rock bursts
- b) Climatic, fire and gas and rock outbursts
- c) Methane gas, coal and fire dust explosion
- d) Coal dust explosion, dusts harmful to health and hydrogen sulphide dust

5. The methane hazard is defined as the possibility of the occurrence of:

- a) Ignition and explosion of methane
- b) Sudden discharge, ignition and explosion of methane
- c) Ignition and explosion of methane and formation of an anaerobic mixture
- d) Methane explosion and formation of an anaerobic mixture

6. Methane may explode in the range:

- a) From 2 to 5%
- b) From 2 to 15%
- c) From 5 to 15%
- d) Over 15%

7. The endogenous fire incubation period is the time of carbon oxidation:

- a) From initial temperature to critical temperature
- b) From critical temperature to ignition point
- c) From initial temperature to ignition point
- d) From substitute temperature to critical temperature

8. A rock burst is a dynamic phenomenon caused by an seismic events as a result of which:

- a) The underground excavation has been completely or partially destroyed or damaged
- b) The surface object is fully or partially destroyed or damaged
- c) The underground excavation or surface facility has been totally or partially destroyed or damaged
- d) The underground excavation and the surface facility have been completely or partially destroyed or damaged

9. Exploitation edges in the seam increase the stresses in the layers in their area:

- a) Above

- b) Below
- c) Above and below
- d) Do not increase stresses

10. The seismological method consists in registering the rock mass vibrations in the form of:

- a) Small fractures of the rock mass with energies below 10 J
- b) Small fractures of the rock mass with energies below 100 J
- c) Shocks events with energies above 100 J
- d) High-energy shocks with energies above 105 J

11. The water hazard in mines is the possibility of inlet into the mine excavations:

- a) Water
- b) Mixtures of water with loose rock material
- c) Water or a mixture of water and loose rock material
- d) Water and mixtures of water with loose rock material

12. The source of water hazard in underground mines may be:

- a) Heavy rainfall, including floods
- b) Surface water
- c) Groundwater
- d) Surface and underground waters

Mining machinery and transport systems

1. What are the advantages of electromechanical drives for conveyors used in mining?

- a) High overall efficiency
- b) High starting torques possible
- c) Reduction of dynamic forces
- d) Ease of turning the gear with its adjustment and the ability to control the engine remotely

2. What are the disadvantages of using torque converters in belt conveyor drives

- a) Significant voltage drops in the supply network
- b) High starting torque
- c) Decrease in overall efficiency of the propulsion system
- d) Excessive motor heating (high inrush currents)

3. The reason for the reduction of strength or destruction of the mechanical connection of the belt may be:

- a) Too heavy loads, especially with the ramping force S_n
- b) Incorrect connection
- c) Fatigue phenomena of ends of joined tapes or mechanical elements
- d) Weakening of the belt cross-section due to perforation with pins

4. The value of the belt tensioning force for the belt conveyor must be selected in such a way as to simultaneously meet the following conditions:

- a) The belt sag between idler sets must be limited in order to maintain the correct geometric shape of the belt
- b) Increased resistance to rotation of side idlers in subsequent sets
- c) The lateral slope of repetitive sections of the route
- d) It must be ensured that the belt interacts with the driven or braked drum without slipping

5. The advantages of tire transport include:

- a) The possibility of loading and unloading anywhere in the mine and in a relatively uncomplicated way
- b) Flexibility, enabling the change of transport route and directing the machine park in any way to different points of the mine
- c) High overall efficiency of the propulsion system, including the internal combustion engine, of more than 95%
- d) The possibility of excluding from traffic, in the event of damage, only the damaged vehicle.

6. When selecting the load box of technological vehicles, the following are used for the transported material:

- a) Angle of repose at rest
- b) Bulk density
- c) Abrasiveness
- d) Loosening factor

7. The design of the articulated hauler is characterized by the following:

- a) All undercarriage and bodywork assemblies are mounted on a common frame and the turning of the wheels is achieved by tilting them in relation to the front axle of the chassis
- b) The cabin and internal combustion engine are located on the front frame, and the cargo box on the rear frame. Both frames are connected in the middle by a joint and can be tilted in relation to each other by means of hydraulic cylinders
- c) Is a combination of vehicles - a tractor unit with a self-unloading trailer
- d) Has a four-axle chassis with at least two steered axles

8. The selection of means of transport in mining depends, inter alia, on:

- a) Geometric dimensions of workings and dumps
- b) Type of transported masses
- c) The shortest time for making the deposit available
- d) Transport distance

9. What are the main resistance to motion of a technology vehicle in steady motion?

- a) Hill-climbing resistance
- b) Resistance force of unbalanced masses
- c) Rolling resistance force
- d) Internal friction force (friction occurring in the drive train)

10. The driving force on the circumference of the driven wheels of the technological vehicle depends, inter alia, on:

- a) Gross vehicle weight
- b) Total resistance to motion
- c) Gear ratios of the driveline
- d) None of the above

11. Articulated wheel loaders used in Polish underground mining of ores are characterized by the outer turning radius at the level of:

- a) From ~ 5 to ~ 8 m
- b) From ~ 3 to ~ 6 m
- c) From ~ 4 to ~ 6 m
- d) From ~ 3.5 to ~ 6.5 m

12. "Feeder breaker" is:

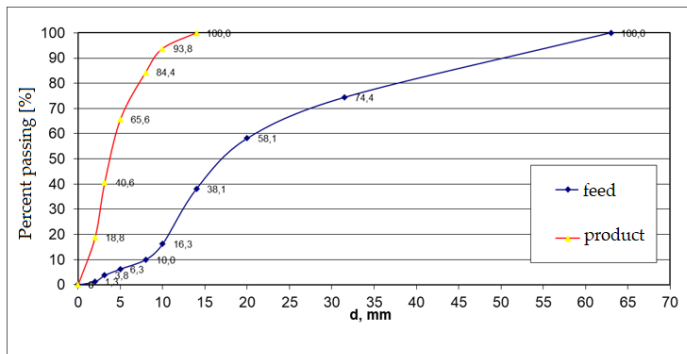
- a) A transfer and crushing device cooperating with a haulage car in a chamber-and-pillar system in coal mining
- b) A crusher built on a conveyor situated in the roadway below longwall
- c) A device used to feed the output onto the belt conveyor in the forehead driven with the BM system
- d) A small haulage car on a tracked chassis

13. In order to level the weight of the carrying cable in shaft transport, the following are used:

- a) Round steel cables
- b) Flat steel-rubber cables
- c) Balance cables
- d) Counterweights

Processing of mineral raw materials

2. The figure shows the graphs of the grain composition curves of the feed and the product after grinding. Calculate the fineness of S90

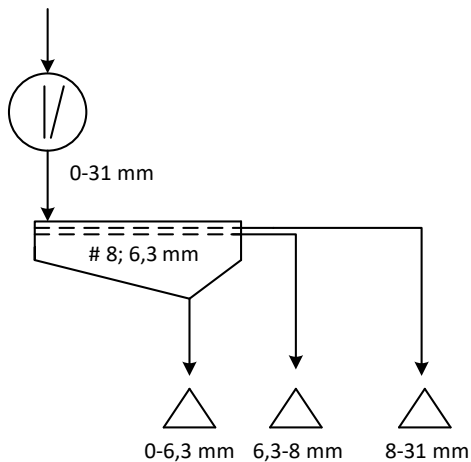


- a) Around 6.3
- b) Around 4.5
- c) Around 3.5
- d) Around 7.3

6. What is oversize

- a) overflow product
- b) Screen top product
- c) Product not milled
- d) Content of coarse grains (undersized) in the undersized product

7. In which grain class can there be sub-grain in the presented diagram



- a) 0-6.3 mm and 6.3-8 mm only
- b) Only in class 0-6.3 mm
- c) Only in class 6.3-8 mm
- d) Only in grades 6.3-8 mm and 8-31 mm

11. The classification devices are:

- a) Air separator, sword scrubber, concentration table
- b) Impact disintegrator, fine scrubber, cone crusher
- c) Hydrocyclone, cyclone, sifter, coil classifier
- d) All devices listed in A, B, C

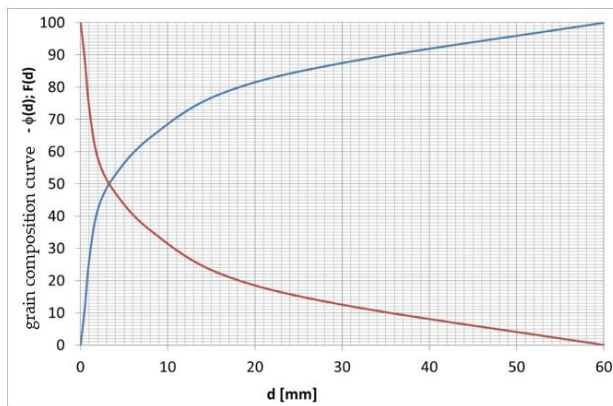
12. The most important indicators for assessing the screening process are:

- a) Probable dispersion, percent passing, weight of bottom products
- b) Efficiency, divided grain, imperfection, oversize and undersize content
- c) Capacity, content of regular grains, degree of grinding
- d) All answers listed in A, B, C

16. Mark the correct answer:

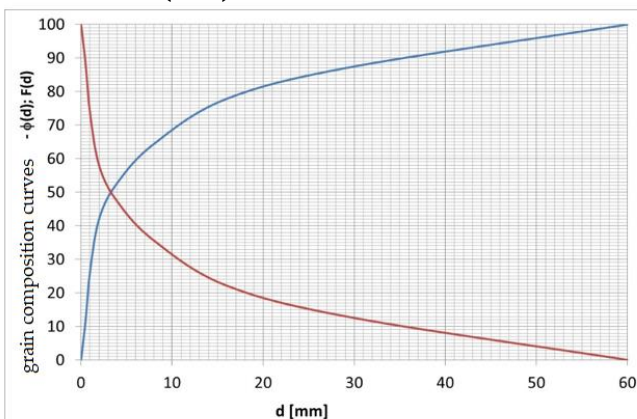
- a) The screening process is best in the grain size range of 0.100 mm to 0.1 mm, especially dry
- b) The classification process in the horizontal-current and vertical-current hydraulic classifier occurs best if the feed contains grains that equate
- c) The classification process in a hydrocyclone is best when the feed is above 9mm
- d) The thickening process in the hydrocyclone is best if the HC is inclined to the horizontal by a dozen or so degrees

18. The figure shows the grain composition curve of the raw material, what percentage is the grain grade 6-35 mm



- a) 90%
- b) 60%
- c) 30%
- d) 40%

19. The figure shows the grain composition curve of the raw material, equal to the grain size of 90% (d90)



- a) 1 mm
- b) 2 mm
- c) 36 mm
- d) 3 mm

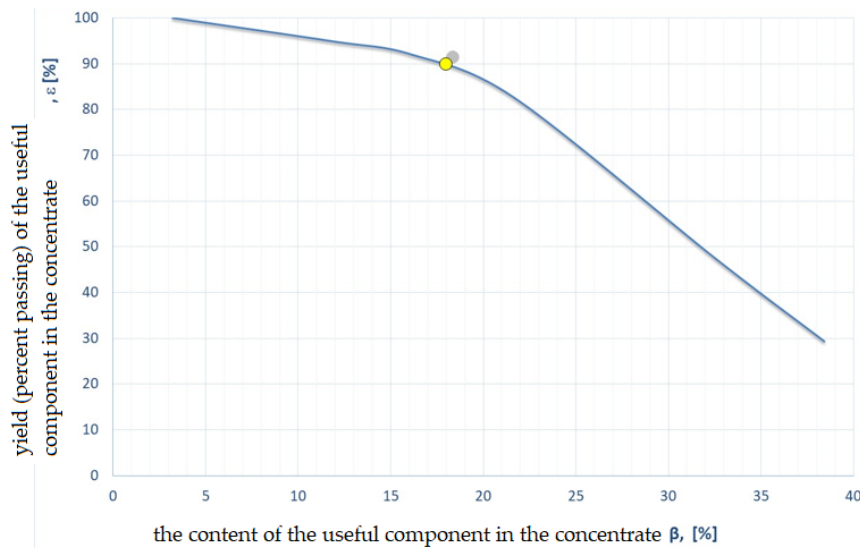
23. What is the useful ingredient yield (percent passing) in the concentrate if the output of the concentrate is 6%, the useful ingredient content in the concentrate is 30% and the useful ingredient content in the feed is 2%?

- a) 60%
- b) 90%
- c) 95%
- d) 65%

25. The ash content in the coal which is the feed to the treatment plant is 40%, if the yield (percent passing) of combustible parts in the concentrate is 90% and the output of the coal concentrate is 60%, what is the ash content in the concentrate?

- a) 20%
- b) 10%
- c) 5%
- d) 15%

30. What is the yield (percent passing) of the concentrate for the point determined on the enrichment characteristics in the Halbach curve system (yield as a function of component content in the concentrate), if the useful component content in the feed is 1%



- a) It is impossible to calculate the concentrate output
- b) Above 10%
- c) 7%
- d) 5%

34. For the improvement of iron ore, it is most advantageous to use:

- a) Flotation
- b) Gravity
- c) Magnetic
- d) Biological

35. For the enrichment of coal with a grain size of 20-200 mm, it is most advantageous to use the enrichment:

- a) Flotation
- b) On the concentration table
- c) In hydrocyclones

d) In heavy-liquids

36. What is the correct sequence of operations included in the ore processing system

- a) It doesn't matter the order of operations
- b) Crushing-screening-milling and classification-enrichment-dewatering
- c) Screening-milling and classification-enrichment-crushing-dewatering
- d) Crushing-grinding and classification-enrichment-sieving-dewatering

37. The metal content of the concentrate depends mainly on:

- a) Ore mineral composition
- b) Water content of the concentrate
- c) Ore grinding
- d) Field exploitation method