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**Economic Commission for Europe**

Inland Transport Committee

**Working Party on the Transport of Dangerous Goods**

**Joint Meeting of Experts on the Regulations annexed to the
European Agreement concerning the International Carriage
of Dangerous Goods by Inland Waterways (ADN)
(ADN Safety Committee)**

**Thirty-eighth session**

Geneva, 23–27 August 2021

Item 3 (d) of the provisional agenda

**Implementation of the European Agreement concerning
the International Carriage of Dangerous Goods
by Inland Waterways (ADN):
Training of experts**

 ADN catalogue of questions 2021: Chemicals

 Transmitted by the Central Commission for the Navigation of the Rhine (CCNR)[[1]](#footnote-1)\*,[[2]](#footnote-2)\*\*

|  Chemicals — knowledge of physics and chemistryExamination objective 1: General |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 331 01.0-01 | Basic general knowledge | B |
|  | The combustion of butane is:A A physical reactionB A chemical reactionC A biological reactionD A geological reaction |  |
| 331 01.0-02 | Basic general knowledge | B |
|  | Which of the following could happen to a substance in a physical reaction?A The substance’s state changes and the substance itself also changesB The substance’s state changes but the substance itself does not changeC The substance’s state does not change but the substance itself changesD The substance’s state does not change, nor does the substance itself |  |
| 331 01.0-03 | Basic general knowledge | C |
|  | Which of the following reactions is a chemical reaction?A The melting of candle waxB The dissolving of sugar in waterC The oxidation of ironD The evaporation of motor spirit or gasoline or petrol |  |
| 331 01.0-04 | Basic general knowledge | D |
|  | Which of the following reactions is a physical reaction?A The combustion of diesel fuelB The decomposition of water into hydrogen and oxygenC The oxidation of aluminiumD The solidification of benzene |  |
| 331 01.0-05 | Basic general knowledge | B |
|  | Which of the following reactions is a physical reaction?A The decomposition of mercury oxide into mercury and oxygenB The expansion of gasoilC The polymerization of styreneD The combustion of home heating oils |  |
| 331 01.0-06 | Basic general knowledge | A |
|  | What is the evaporation of UN No. 1846, CARBON TETRACHLORIDE?A A physical reactionB A chemical reactionC A biological reactionD A geological reaction |  |
| 331 01.0-07 | Basic general knowledge | B |
|  | What is polymerization of UN No. 2055, STYRENE MONOMER STABILIZED?A A physical reactionB A chemical reactionC A biological reactionD A geological reaction |  |
| 331 01.0-08 | Basic general knowledge | C |
|  | What is the combustion of UN No. 2247, n-DECANE?A A biological reactionB A physical reactionC A chemical reactionD A geological reaction |  |

| Chemicals — knowledge of physics and chemistryExamination objective 2: Temperature, pressure, volume |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 331 02.0-01 | Basic knowledge of physics | C |
|  | Which value is equivalent to 0.5 bar?A 0.5 kPaB 5.0 kPaC 50.0 kPaD 500.0 kPa |  |
| 331 02.0-02 | Basic knowledge of physics | B |
|  | A closed container has a pressure of 180 kPa at a temperature of 27 °C. The volume of the container does not change. What is the excess pressure at 77 °C?A 154.3 kPaB 210.0 kPaC 230.0 kPaD 513.3 kPa |  |
| 331 02.0-03 | Basic knowledge of physics | D |
|  | A closed cargo tank is 95 % filled with UN No. 1547, ANILINE. When will vaporization of the aniline cease?A Once the pressure of the aniline vapour is equal to the outside air pressureB Once the aniline has completely vaporizedC Once the critical temperature has been reachedD Once the pressure of the aniline vapour is equal to the saturated vapour pressure |  |
| 331 02.0-04 | Basic knowledge of physics | A |
|  | The pressure above a liquid increases. What happens to the liquid’s boiling point?A The boiling point increasesB The boiling point decreasesC The boiling point remains the same D The boiling point increases then drops |  |
| 331 02.0-05 | Basic knowledge of physics | C |
|  | A closed bottle of gas is heated in the sun. What happens?A Only the pressure risesB Only the temperature risesC Both the pressure and the temperature riseD The pressure falls, but the temperature rises |  |
| 331 02.0-06 | Basic knowledge of physics | C |
|  | A closed empty cargo tank with a volume of 240 m3 has an excess pressure of 10 kPa. The tank receives a liquid cargo of 80 m3. The temperature remains constant. What is then the excess pressure in the cargo tank?A 5 kPaB 7.5 kPaC 15 kPaD 30 kPa |  |
| 331 02.0-07 | Basic knowledge of physics | B |
|  | A liquid at constant temperature has:A A specific shape and a specific volumeB No specific shape, but a specific volumeC A specific shape, but no specific volumeD No specific shape or volume |  |
| 331 02.0-08 | Basic knowledge of physics | A |
|  | What is the critical temperature?A The temperature above which a gas cannot be liquefiedB The lowest temperature possible, namely 0 KC The temperature above which a gas can be liquefied D The temperature at which the lower explosive limit is reached |  |
| 331 02.0-09 | Basic knowledge of physics | A |
|  | Which temperature is equivalent to 353 K?A 80 ºCB 253 ºCC 353 ºCD 626 ºC |  |
| 331 02.0-10 | Basic knowledge of physics | C |
|  | At 21 °C, the volume of an enclosed gas is 98 litres. The pressure remains constant. What is the volume at 30 °C?A 95 litresB 98 litresC 101 litresD 140 litres |  |
| 331 02.0-11 | Basic knowledge of physics | B |
|  | What is the lowest temperature possible?A 0 ºCB 0 KC -273 KD 273 K |  |
| 331 02.0-12 | Basic knowledge of physics | B |
|  | Which liquids are considered as liquids having a low boiling point?A Liquids with a boiling point below 0 °CB Liquids with a boiling point below 100 °CC Liquids with a boiling point between 100 °C and 150 °CD Liquids with a boiling point above 150 °C |  |
| 331 02.0-13 | Basic knowledge of physics | C |
|  | When a pure substance melts, what happens to the temperature?A It risesB It fallsC It remains constantD It rises or falls depending on the substance |  |
| 331 02.0-14 | Basic knowledge of physics | B |
|  | The boiling point of UN No. 1897, TETRACHLOROETHYLENE is 121 °C. What is tetrachloroethylene?A A liquid with a low boiling pointB A liquid with a medium boiling pointC A liquid with a high boiling pointD A gas |  |
| 331 02.0-15 | Basic knowledge of physics | C |
|  | Which is equivalent to a temperature of 30 °C?A 30 KB 243 KC 303 KD -243 K |  |
| 331 02.0-16 | Basic knowledge of physics | D |
|  | Which are liquids with a high boiling point?A Liquids with a boiling point below 50 °CB Liquids with a boiling point below 100 °CC Liquids with a boiling point between 100 °C and 150 °CD Liquids with a boiling point above 150 °C |  |
| 331 02.0-17 | Basic knowledge of physics | B |
|  | In Gay-Lussac’s law, what unit is always used to express temperature?A ºCB KC PaD ºF |  |
| 331 02.0-18 | Basic knowledge of physics | A |
|  | The boiling point of UN No. 1155, DIETHYL ETHER is 35 °C. What is diethyl ether?A A liquid with a low boiling pointB A liquid with a medium boiling pointC A liquid with a high boiling pointD A liquid with a very high boiling point |  |
| 331 02.0-19 | Basic knowledge of physics | D |
|  | Which unit is used to express pressure?A The kelvinB The litreC The newtonD The pascal |  |
|  |  |  |
| 331 02.0-20 | Basic knowledge of physics | D |
|  | What ppm value is equivalent to a volume of 100 %?A 1 ppmB 100 ppmC 1,000 ppmD 1,000,000 ppm |  |
| 331 02.0-21 | Basic knowledge of physics | B |
|  | A closed container has an excess pressure of 200 kPa at a temperature of 7 °C. The excess pressure rises to 400 kPa. The volume does not change. What is the new temperature?A 14 ºCB 287 ºCC 560 ºCD -133 ºC |  |
| 331 02.0-22 | Basic knowledge of physics | C |
|  | In an enclosed space, the absolute temperature drops to half the initial temperature. What happens to the pressure?A The pressure doublesB The pressure remains constantC The pressure drops by halfD The pressure becomes four times lower |  |
| 331 02.0-23 | Basic knowledge of physics | C |
|  | What does the boiling point of a liquid signify?A The pressure of the liquid at a temperature of 100 °CB The quantity of liquid that reaches boiling pointC The temperature at which the liquid is converted to a vapour at a pressure of 100 kPa D The volume of a liquid at a temperature of 100 °C and a pressure of 100 kPa |  |

| Chemicals — knowledge of physics and chemistryExamination objective 3: Physical state |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 331 03.0-01 | Basic knowledge of physics | C |
|  | What is the transition from solid to gaseous state called?A SolidificationB CondensationC SublimationD Gasification |  |
| 331 03.0-02 | Basic knowledge of physics | B |
|  | What is the transition from gaseous to liquid state called?A SolidificationB CondensationC MaturationD Sublimation |  |
| 331 03.0-03 | Basic knowledge of physics | B |
|  | What is condensation an example of?A The transition from gaseous to solid stateB The transition from gaseous to liquid stateC The transition from liquid to gaseous stateD The evaporation of a substance |  |
| 331 03.0-04 | Basic knowledge of physics | A |
|  | Which of the following is an example of sublimation?A The transition of carbonic snow to a gaseous stateB The formation of condensation on a cold windowC The solidification of molten ironD The evaporation of liquid hexane from soya cake |  |
| 331 03.0-05 | Basic knowledge of physics | D |
|  | What is solidification?A The transition from solid to liquid stateB The transition from liquid to gaseous stateC The transition from gaseous to liquid stateD The transition from liquid to solid state |  |
| 331 03.0-06 | Deleted (2012) |  |
|  |  |  |
| 331 03.0-07 | Basic knowledge of physics | C |
|  | What is the transition from solid to gaseous state called?A MeltingB SolidificationC SublimationD Gasification |  |
| 331 03.0-08 | Basic knowledge of physics | A |
|  | At normal pressure, the temperature of a substance is higher than its boiling point. What then is the physical state of the substance?A GaseousB LiquidC SolidD Liquid or solid |  |
| 331 03.0-09 | Basic knowledge of physics | B |
|  | What physical state does UN No. 1605, ETHYLENE DIBROMIDE (1.2 DIBROMETHANE) assume at a temperature of +5 °C?A A gaseous stateB A solid stateC A liquid stateD An indeterminate state |  |
| 331 03.0-10 | Basic knowledge of physics | C |
|  | What is the transition of a substance from a solid state to a gaseous state called?A EvaporationB CondensationC SublimationD Recombination |  |
| 331 03.0-11 | Basic knowledge of chemistry | A |
|  | A new substance is formed as a result of a reaction. What kind of reaction has taken place?A A chemical reactionB A physical reactionC A meteorological reactionD A logical reaction |  |

| Chemicals — knowledge of physics and chemistryExamination objective 4: Fire, combustion |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 331 04.0-01 | Basic knowledge of substances | B |
|  | The explosivity range of UN No. 1547, ANILINE is 1.2 % to 11 % (by volume). What would the properties of a mixture of 0.1 % (by volume) of aniline and 99.9 % (by volume) of air be?A Flammable but not explosiveB Neither flammable nor explosiveC Flammable and explosiveD Not flammable, but explosive |  |
| 331 04.0-02 | Basic knowledge of substances | B |
|  | The auto-ignition temperature of UN No. 1779, FORMIC ACID is 480 °C. Which of the following is true if the temperature of the formic acid-air mixture is below 480 °C?A The formic acid cannot igniteB The formic acid cannot ignite spontaneously (of its own accord)C The formic acid might ignite spontaneously (of its own accord)D The formic acid might ignite spontaneously (of its own accord), but not explode |  |
| 331 04.0-03 | Basic knowledge of substances | C |
|  | What is a catalyst?A A substance that prevents polymerization without contaminating the productB A substance that prevents static electricity without contaminating the productC A substance that accelerates a reaction but is not altered by the reactionD A substance that can be added as a colouring without contaminating the product |  |
| 331 04.0-04 | Basic knowledge of substances | B |
|  | What is a detonation?A A cleaning productB An explosionC A test tubeD An inhibitor |  |
| 331 04.0-05 | Basic knowledge of substances | C |
|  | The flash-point of UN No. 1282, PYRIDINE is 20 ºC. What happens to pyridine at a temperature of 25 ºC?A It is liable to ignite spontaneouslyB It does not produce enough vapour to be ignitableC It produces enough vapour to be ignitableD It produces too much vapour to be ignitable |  |
| 331 04.0-06 | Basic knowledge of substances | A |
|  | Which reaction requires the highest speed of combustion?A A detonationB A deflagrationC An explosionD An implosion |  |
| 331 04.0-07 | Basic knowledge of substances | C |
|  | How can an explosion be prevented by thermal intervention?A By heating the substanceB By increasing the pressure on the substanceC By cooling the substanceD By compressing the substance |  |
| 331 04.0-08 | Basic knowledge of substances | B |
|  | The explosivity range of UN No. 1114, BENZENE is 1.2 to 8.6 % (by volume). What would the properties of a mixture of 5 % (by volume) of benzene and 95 % (by volume) of air be?A Non-flammable but explosiveB Flammable and explosiveC Neither flammable nor explosiveD Flammable but not explosive |  |

|  Chemicals — knowledge of physics and chemistryExamination objective 5: Density |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 331 05.0-01 | Basic knowledge of substances – ρ = m/V | B |
|  | A cargo of UN No. 2874, FURFURYL ALCOHOL has a mass of 550 tonnes. The relative density of furfuryl alcohol is 1.1. What is the volume of the cargo?A 5 m3B 500 m3C 605 m3D 2,000 m3 |  |
| 331 05.0-02 | Basic knowledge of substances – ρ = m/V | C |
|  | A cargo of UN No. 1991, CHLOROPRENE, STABILZED, has a volume of 500 m3. The relative density of chloroprene is 0.96. What is the mass of the cargo?A 0.48 tB 192.0 tC 480.0 tD 521.0 t |  |
| 331 05.0-03 | Basic knowledge of substances – ρ = m/V | A |
|  | A cargo of 600 m3 UN No. 1218, ISOPRENE, STABILIZED, has a mass of 420 tonnes. What then is the relative density of the isoprene?A 0.7B 2.03C 1.43D 2.52 |  |
| 331 05.0-04 | Basic knowledge of substances – ρ = m/V | B |
|  | How is the density of a substance calculated?A By dividing the volume by the massB By dividing the mass by the volumeC By multiplying the volume by the massD By adding the mass and the volume |  |
| 331 05.0-05 | Basic knowledge of substances – ρ = m/V | C |
|  | The temperature of a quantity of UN No. 1547, ANILINE increases. What happens to the density of the aniline?A The density increasesB The density remains constantC The density decreasesD The density sometimes increases and sometimes decreases |  |
| 331 05.0-06 | Basic knowledge of substances – ρ = m/V | B |
|  | The mass density (density) of a substance is given as 2.15 kg/dm3. Which value corresponds to this density?A 0.00215 t/m3B 2.15 t/m3C 21.5 t/m3D 215 t/m3 |  |
| 331 05.0-07 | Basic knowledge of substances – ρ = m/V | B |
|  | The relative density of a liquid is 0.95. What is the mass of 1,900 m3 of this liquid?A 1,805 kgB 1,805 tC 200 kgD 200 t |  |
| 331 05.0-08 | Basic knowledge of substances – ρ = m/V | A |
|  | The mass of 180 litres of UN No. 1092, ACROLEINE, STABILIZED is 144 kg. What is the relative density of the substance?A 0.8B 1.25C 2.59D 3.6 |  |
| 331 05.0-09 | Basic knowledge of substances – ρ = m/V | C |
|  | The relative density of a substance is 1.15. What is its volume if its mass is 2,300 tonnes?A 250 m3B 500 m3C 2,000 m3D 2,645 m3 |  |
| 331 05.0-10 | Basic knowledge of substances – ρ = m/V | A |
|  | The volume of a quantity of gas decreases. What happens to the density?A The density increasesB The density remains constantC The density decreasesD The density sometimes increases and sometimes decreases |  |
| 331 05.0-11 | Basic knowledge of substances – ρ = m/V | A |
|  | How is the mass of a substance calculated?A By multiplying the mass density (density) by the volumeB By dividing the mass density (density) by the volumeC By dividing the volume by the mass density (density)D By dividing the volume by the pressure |  |
| 331 05.0-12 | Basic knowledge of substances – ρ = m/V | C |
|  | How is the volume of a substance calculated?A By multiplying the mass density (density) by the massB By dividing the mass density (density) by the massC By dividing the mass by the mass density (density)D By dividing the mass by the pressure |  |
| 331 05.0-13 | Basic knowledge of substances – ρ = m/V | A |
|  | The temperature of a quantity of UN No. 2789, ACETIC ACID SOLUTION decreases. How does the density of the acetic acid change?A The density increasesB The density decreasesC The density remains constantD The density sometimes increases and sometimes decreases |  |
| 331 05.0-14 | Basic knowledge of substances – ρ = m/V | C |
|  | What is the unit of mass density (density) used in the International System of Units (SI)?A m3B kgC kg/m3D l |  |
| 331 05.0-15 | Basic knowledge of substances – ρ = m/V | C |
|  | What does the density of a gas depend on?A On temperature onlyB On pressure onlyC On pressure and temperatureD On volume only |  |
| 331 05.0-16 | Basic knowledge of substances – ρ = m/V | B |
|  | In most cases, how does the density of liquid vapours compare with the density of the outside air?A It is equivalentB It is higherC It is lowerD None of the above |  |

|  Chemicals — knowledge of physics and chemistryExamination objective 6: Mixtures, chemical bonds |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 331 06.0-01 | Basic knowledge of chemistry | B |
|  | A metal reacts with oxygen. A black powdery substance results. What do we call this substance?A An elementB A compoundC An alloyD A mixture |  |
| 331 06.0-02 | Basic knowledge of chemistry | D |
|  | Which of the following statements is true?A A mixture always consists of three substances in specific proportionsB A mixture involves a chemical reactionC When a mixture is produced, heat is always releasedD A mixture is composed of at least two substances |  |
| 331 06.0-03 | Basic knowledge of chemistry | C |
|  | What is pure water (H2O) an example of?A An alloyB An elementC A compoundD A mixture |  |
| 331 06.0-04 | Basic knowledge of chemistry | C |
|  | What does an organic compound always contain?A Hydrogen atomsB Oxygen atomsC Carbon atomsD Nitrogen atoms |  |
| 331 06.0-05 | Basic knowledge of chemistry | A |
|  | What is formed when sugar is dissolved?A A mixtureB A compoundC An alloyD An element |  |
| 331 06.0-06 | Basic knowledge of chemistry | B |
|  | What happens when hydrogen is released from a compound?A Being heavier than air, it collects near the groundB Being lighter than air, it risesC It immediately combines with nitrogen in the airD Water is formed in a catalytic reaction |  |
| 331 06.0-07 | Basic knowledge of chemistry | D |
|  | Which elements are contained in the compound nitric acid (HNO3)?A Sulphur, nitrogen and oxygenB Carbon, hydrogen and nitrogenC Helium, sodium and oxygenD Hydrogen, nitrogen and oxygen |  |
| 331 06.0-08 | Basic knowledge of chemistry | B |
|  | Can liquids be mixed?A Yes, liquids are always miscibleB Yes, but not all liquids are miscible with each otherC No, liquids are never miscibleD Yes, liquids are miscible in any proportions |  |

|  Chemicals — knowledge of physics and chemistryExamination objective 7: Molecules, atoms |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 331 07.0-01 | Basic knowledge of chemistry | A |
|  | What is NaNO3?A An inorganic compoundB An organic compoundC A mixtureD An alloy |  |
| 331 07.0-02 | Basic knowledge of chemistry | B |
|  | What is C3H8?A A mixtureB An organic compoundC An inorganic compoundD An alloy |  |
| 331 07.0-03 | Basic knowledge of chemistry | D |
|  | What is the symbol for the element “oxygen”?A SB HC ND O |  |
| 331 07.0-04 | Basic knowledge of chemistry | B |
|  | What is the symbol for the element “nitrogen”?A SB NC OD H |  |
| 331 07.0-05 | Basic knowledge of chemistry | C |
|  | Which of the following statements is false?A Molecules are composed of atomsB A pure substance is composed of a single type of moleculeC A compound is always composed of a single type of atomD An element is composed of a single type of atom |  |
| 331 07.0-06 | Basic knowledge of chemistry | A |
|  | What is the symbol for the element “hydrogen”?A HB OC WD N |  |
| 331 07.0-07 | Basic knowledge of chemistry | A |
|  | What are molecules?A Molecules are electrically neutral particles composed of two or more atomsB Molecules are the smallest units of a substance that have half of all the properties of the substanceC Molecules are atoms that form at 20 °CD Molecules are components of atoms |  |
| 331 07.0-08 | Basic knowledge of chemistry | A |
|  | What is an element always made up of?A AtomsB MixturesC CompoundsD Molecules |  |
| 331 07.0-09 | Basic knowledge of chemistry | B |
|  | What is the term for an electrically neutral particle composed of two or more atoms?A A neutronB A moleculeC An ionD A proton |  |
| 331 07.0-10 | Basic knowledge of chemistry | B |
|  | What is the correct formula for three molecules of water?A (H2O)3B 3 H2OC H6O3D H2O |  |
| 331 07.0-11 | Basic knowledge of chemistry | D |
|  | What is the Latin name for oxygen?A FerrumB HydrogeniumC NitrogeniumD Oxygenium |  |
| 331 07.0-12 | Basic knowledge of chemistry | B |
|  | In chemical formulae, what is the significance of the letter “N”?A CarbonB NitrogenC HydrogenD Oxygen |  |
| 331 07.0-13 | Basic knowledge of chemistry | A |
|  | What is the symbol for carbon?A CB HC KD O |  |
| 331 07.0-14 | Basic knowledge of chemistry | B |
|  | What is the molecular mass of UN No. 1294, TOLUENE (C6H5CH3)? (C = 12, H = 1)A 78B 92C 104D 106 |  |
| 331 07.0-15 | Basic knowledge | A |
|  | At what temperature does the kinetic energy of molecules equal zero?A -273 °CB 212 KC 273 KD -100 °C |  |

|  Chemicals — knowledge of physics and chemistryExamination objective 8: Polymerization |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 331 08.0-01 | Basic knowledge of chemistry | B |
|  | What is an inhibitor?A A substance that accelerates a reactionB A substance that prevents polymerizationC A substance that attacks the nervous systemD A substance that prevents electrostatic charge |  |
| 331 08.0-02 | Basic knowledge of chemistry | A |
|  | What substance prevents polymerization?A An inhibitorB A capacitorC A catalystD An indicator |  |
| 331 08.0-03 | Basic knowledge of chemistry | A |
|  | Which of the following statements is correct?A An inhibitor should be properly mixed with the productB An inhibitor may react with the productC An inhibitor may easily evaporate from the productD An inhibitor should have a low flash-point |  |
| 331 08.0-04 | Basic knowledge of chemistry | A |
|  | What is polymerization?A The process by which one or more reactions result in a very large moleculeB A process of combustion during which much heat is liberatedC The process by which a compound is destroyed under the effect of heatD The process by which a compound is destroyed under the effect of an electric current |  |
| 331 08.0-05 | Basic knowledge of chemistry | C |
|  | A cargo tank contains a product that is liable to polymerize easily. To prevent polymerization, an inhibitor has been added. During carriage, a small quantity of the product evaporates and condenses some time later on the surface of the cargo tanks. What might happen to the condensate?A The condensate will not polymerize since it contains an inhibitorB The condensate will not polymerize since it will evaporate firstC The condensate might polymerize since it does not contain an inhibitorD The condensate might polymerize even though it still contains some inhibitor |  |
| 331 08.0-06 | Basic knowledge of chemistry | B |
|  | During transport of a cargo of styrene, precautionary measures should be taken to ensure that the cargo is sufficiently stabilized. What particulars do not need to be included in the transport document?A The name and quantity of the stabilizer addedB The pressure above the stabilized liquid C The date at which the stabilizer was added and its duration of effectiveness under normal conditions D The temperature limits affecting the stabilizer |  |
| 331 08.0-07 | Basic knowledge | D |
|  | What does “poly” in polymerization signify?A LargeB LongC AtomD Many |  |
| 331 08.0-08 | Basic knowledge of chemistry | A |
|  | What characterizes polymerization?A A rise in temperatureB A drop in temperatureC A change in colourD A change in mass |  |
| 331 08.0-09 | Basic knowledge of chemistry | C |
|  | What is an inhibitor?A A type of adhesiveB A cleaning productC A stabilizerD A product that lowers the freezing-point |  |
| 331 08.0-10 | Basic knowledge of chemistry | D |
|  | A substance is liquid at 20 °C and decomposes readily at temperatures above 35 °C. What might this substance be?A A stable gasB An unstable gas C A stable liquidD An unstable liquid |  |
| 331 08.0-11 | Basic knowledge of chemistry | C |
|  | What is a positive catalyst?A A substance that prevents polymerizationB A substance that prevents electrostatic chargeC A substance that accelerates a reactionD A substance that prevents the formation of heat |  |
| 331 08.0-12 | Basic knowledge of chemistry | B |
|  | What is a negative catalyst?A A substance that promotes polymerizationB A substance that slows a chemical reactionC A substance that prevents electrostatic chargeD A substance that inhibits evaporation of a liquid |  |
| 331 08.0-13 | Basic knowledge of chemistry | B |
|  | What is the difference between a chemically stable substance and a chemically unstable substance?A A chemically stable substance decomposes more readily than a chemically unstable substanceB A chemically unstable substance decomposes readily, while a chemically stable substance does not readily decomposeC A chemically unstable substance evaporates more readily than a chemically stable substanceD A chemically unstable substance has a higher melting-point than a chemically stable substance |  |
| 331 08.0-14 | Basic knowledge of chemistry | B |
|  | What do we call the process whereby monomers band together during a chemical reaction?A EvaporationB PolymerizationC DecompositionD Condensation |  |
| 331 08.0-15 | Basic knowledge of chemistry | B |
|  | Which product should be transported in a stabilized state?A UN No. 1114, BENZENEB UN No. 1301, VINYL ACETATE, STABILIZEDC UN No. 1863, FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10 % BENZENED UN No. 2312, PHENOL, MOLTEN |  |
| 331 08.0-16 | Basic knowledge of chemistry | C |
|  | Why is a stabilizer (inhibitor) added to certain products?A To prevent them from explodingB To prevent them from evaporatingC To prevent them from polymerizingD To prevent them from freezing |  |
| 331 08.0-17 | Basic knowledge of chemistry | C |
|  | What often triggers polymerization?A An inhibitorB An excess of nitrogenC A rise in temperatureD A drop in temperature |  |

|  Chemicals — knowledge of physics and chemistryExamination objective 9: Acids, bases |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 331 09.0-01 | Basic knowledge of chemistry | B |
|  | What are solutions with a pH value above 7 called?A AcidsB BasesC SoapsD Suspensions |  |
| 331 09.0-02 | Basic knowledge of chemistry | C |
|  | UN No. 1824, SODIUM HYDROXIDE SOLUTION is an example of which of the following?A A strong acidB A weak acidC A strong baseD A weak base |  |
| 331 09.0-03 | Basic knowledge of chemistry | A |
|  | UN No. 1830, SULPHURIC ACID containing more than 51 % of acid is an example of which of the following?A A strong acidB A weak acidC A strong baseD A weak base |  |
| 331 09.0-04 | Basic knowledge of chemistry | D |
|  | What is the pH value of a base?A Always greater than 14B Always lower than 7C Always equal to 7D Always greater than 7 |  |
| 331 09.0-05 | Basic knowledge of chemistry | C |
|  | How can a base solution be neutralized?A By carefully adding soapB By carefully adding waterC By carefully adding an acid solutionD By carefully adding caustic soda |  |
| 331 09.0-06 | Basic knowledge of chemistry | B |
|  | What are the three properties that characterize an acid?A Corrosive, attacks certain metals, pH greater than 7B Corrosive, attacks certain metals, pH less than 7C Corrosive, attacks certain metals, soapy odourD Corrosive, turns litmus paper red, soapy odour |  |
| 331 09.0-07 | Basic knowledge of chemistry | D |
|  | What is the difference between an acid solution with a pH of 1 and an acid solution with a pH of 3?A The solution with a pH of 1 is more baseB The solution with a pH of 1 is more neutralC The solution with a pH of 1 is more dilutedD The solution with a pH of 1 is more acidic |  |
| 331 09.0-08 | Basic knowledge of chemistry | B |
|  | What is the difference between a solution with a pH of 11 and a solution with a pH of 8?A The solution with a pH of 11 is more acidicB The solution with a pH of 11 is more baseC The solution with a pH of 11 is weakerD There is no difference |  |
| 331 09.0-09 | Basic knowledge of chemistry | C |
|  | What is the pH value of a neutral solution?A 0B 1C 7D 14 |  |
| 331 09.0-10 | Basic knowledge of chemistry | D |
|  | Which is the greatest hazard posed by acids and bases when carried in inland navigation?A ToxicityB FlammabilityC ExplosibilityD Corrosivity |  |
| 331 09.0-11 | Basic knowledge of chemistry | A |
|  | What do hydroxides always contain?A OH-B H+C H3O+D CO- |  |
| 331 09.0-12 | Basic knowledge of chemistry | B |
|  | UN No. 2790, ACETIC ACID SOLUTION, PG III is an example of which of the following?A A strong acidB A weak acidC A strong baseD A weak base |  |
| 331 09.0-13 | Basic knowledge of chemistry | B |
|  | What substance is produced when an acid reacts with a metal?A OxygenB HydrogenC NitrogenD Water |  |
| 331 09.0-14 | Basic knowledge of chemistry | D |
|  | What are bases also called?A Organic substancesB Inorganic substancesC Alkanoic acidsD Alkaline substances |  |
| 331 09.0-15 | Basic knowledge of chemistry | B |
|  | Which of the following products is a base?A UN No. 1685, SODIUM ARSENATEB UN No. 1814, POTASSIUM HYDROXIDE SOLUTIONC UN No. 1230, METHANOLD UN No. 1573, CALCIUM ARSENATE |  |
| 331 09.0-16 | Basic knowledge of chemistry | A |
|  | What is the pH value of a strong acid?A 0-3B 7C 8-10D 10-12 |  |

|  Chemicals — knowledge of physics and chemistryExamination objective 10: Oxidation |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 331 10.0-01 | Basic knowledge of chemistry | A |
|  | Which is an example of slow oxidation?A The formation of iron rustB An explosion of liquefied gasC The combustion of natural gasD The evaporation of motor spirit or gasoline or petrol |  |
| 331 10.0-02 | Basic knowledge of chemistry | B |
|  | What are reducing agents?A Substances that readily donate oxygen to other substancesB Substances that readily take up oxygen from other substancesC Substances that are highly flammableD Substances that never react with other substances |  |
| 331 10.0-03 | Basic knowledge of chemistry | C |
|  | What is oxidation?A The bonding of a substance with carbonB The bonding of a substance with hydrogenC The bonding of a substance with oxygenD The bonding of a substance with nitrogen |  |
| 331 10.0-04 | Basic knowledge of chemistry | A |
|  | What are oxidants?A Substances that readily donate oxygen to other substancesB Substances that readily take up oxygen from other substancesC Substances that are highly flammableD Substances that never react with other substances |  |
| 331 10.0-05 | Basic knowledge of chemistry | B |
|  | What reaction is characteristic of flammable substances?A They release oxygenB They react with oxygenC They do not react with oxygenD They produce oxygen |  |
| 331 10.0-06 | Basic knowledge of chemistry | B |
|  | Which of the following is characteristic of readily flammable substances?A They do not readily react with oxygenB They react readily with oxygenC They never react with oxygenD They release oxygen |  |
| 331 10.0-07 | Basic knowledge of chemistry | A |
|  | What is oxidation?A The reaction of a substance with oxygenB The reaction of a substance with nitrogenC The addition of oxygenD The addition of nitrogen |  |

|  Chemicals — knowledge of physics and chemistryExamination objective 11: Knowledge of chemicals |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 331 11.0-01 | Basic knowledge of chemistry | A |
|  | C4H10 is an example of:A An alkaneB An alkeneC An aromateD A cycloalkane |  |
| 331 11.0-02 | Basic knowledge of chemistry | C |
|  | Which of the following constitute two important groups of hydrocarbons?A Oxidants and reducing agentsB Acids and basesC Alkanes and alkenesD Bases and hydroxides |  |
| 331 11.0-03 | Basic knowledge of chemistry | A |
|  | What is a polymer?A A chain of very large molecules comprising repeated molecular unitsB A chemical that should prevent a particular substance from polymerizingC A chemical that accelerates a reaction but is not altered by the reactionD A readily flammable product that could trigger a chemical reaction |  |
| 331 11.0-04 | Basic knowledge of chemistry | B |
|  | What are organic nitrogen compounds?A AromatesB NitrilesC EthersD Esters |  |
| 331 11.0-05 | Basic knowledge of chemistry | C |
|  | What is the term for hydrocarbons in which one or several hydrogen atoms are replaced by a hydroxyl (OH radical)?A EstersB EthersC AlcoholsD Ketones |  |
| 331 11.0-06 | Basic knowledge of chemistry | C |
|  | What is the term for substances whose molecules contain a very large quantity of oxygen?A AlkenesB KetonesC PeroxidesD Nitriles |  |
| 331 11.0-07 | Basic knowledge of chemistry | D |
|  | Which of the following is an example of a ketone?A UN No. 1170, ETHANOLB UN No. 1203, MOTOR SPIRIT or GASOLINE or PETROLC UN No. 2055, STYRENE MONOMER, STABILIZEDD UN No. 1090, ACETONE |  |
| 331 11.0-08 | Basic knowledge of chemistry | D |
|  | Which of the following constitutes an important group of esters?A AlcoholsB PeroxidesC BasesD Fats and oils |  |
| 331 11.0-09 | Basic knowledge of chemistry | B |
|  | The atomic mass of hydrogen is 1, the atomic mass of oxygen is 16 and the atomic mass of sulphur is 32. What is the molecular mass of sulphuric acid (H2SO4)?A 49B 98C 129D 146 |  |
| 331 11.0-10 | Basic knowledge of chemistry | C |
|  | The atomic mass of carbon is 12 and the atomic mass of oxygen is 16. What is the molecular mass of carbon dioxide (CO2)?A 38B 40C 44D 76 |  |
| 331 11.0-11 | Basic knowledge of chemistry | B |
|  | The atomic mass of calcium is 40, the atomic mass of oxygen is 16 and the atomic mass of hydrogen is 1. What is the molecular mass of calcium hydroxide (Ca(OH)2)?A 58B 74C 96D 114 |  |
| 331 11.0-12 | Basic knowledge of chemistry | A |
|  | Why are aromates so called?A Because of their odourB Because of their colourC Because of their toxicityD Because of their solubility |  |
| 331 11.0-13 | Basic knowledge of chemistry | D |
|  | Which is an example of a nitric compound?A UN No. 2312, PHENOL, MOLTENB UN No. 1090, ACETONEC UN No. 1203, MOTOR SPIRIT or GASOLINE or PETROLD UN No. 1664, NITROTOLUENES, LIQUID |  |
| 331 11.0-14 | Basic knowledge of chemistry | B |
|  | What is UN No. 1230, METHANOL an example of?A An esterB An alcoholC A nitrileD An ether |  |
| 331 11.0-15 | Basic knowledge of chemistry | D |
|  | Which of the following is an example of an alkene?A UN No. 1011, BUTANEB UN No. 1077, PROPYLENEC UN No. 1170, ETHANOLD UN No. 1001, ACETYLENE, DISSOLVED |  |
| 331 11.0-16 | Basic knowledge of chemistry | B |
|  | Which of the following substances is saturated?A UN No. 1077, PROPENEB UN No. 1265, PENTANES, liquidC UN No. 1962, ETHYLENE, DISSOLVEDD UN No. 1055, ISOBUTYLENE |  |
| 331 11.0-17 | Basic knowledge of chemistry | B |
|  | Which group of substances tends to be toxic and carcinogenic?A AlcoholsB AromatesC Alkane acidsD Alkanes |  |
| 331 11.0-18 | Basic knowledge of chemistry | C |
|  | What is PVC?A A monomerB An alkane acidC A polymerD An aromate |  |
| 331 11.0-19 | Basic knowledge of chemistry | A |
|  | What is the term for double bond hydrocarbons? A AlkenesB AlkanesC AlcynesD Alcyones |  |
| 331 11.0-20 | Deleted (2011) |  |

|  Chemicals — knowledge of physics and chemistryExamination objective 12: Chemical reactions |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 331 12.0-01 | Basic knowledge of chemistry | B |
|  | Why is it important to ensure that water does not come into contact with SULPHURIC ACID concentrate containing more than 51 % acid (UN No. 1830)?A Because when water is added, flammable hydrogen gas is formedB Because this results in the release of much heat, causing water to evaporate and bubbleC Because this results in polymerization of the sulphuric acidD Because sulphuric acid reacts with water, releasing highly toxic vapours |  |
| 331 12.0-02 | Basic knowledge of chemistry | A |
|  | Which of the following is a classic example of a self-accelerating reaction?A The polymerization of styreneB The decomposition of water into hydrogen and oxygenC The reaction of nitrogen with waterD The oxidation of iron |  |
| 331 12.0-03 | Basic knowledge of chemistry | B |
|  | A chemical that is liable to polymerization is loaded. The adjoining cargo tank contains another chemical. What must be ensured with regard to the chemical in the adjoining cargo tank? A The chemical must not contain waterB The chemical must not be too hotC The chemical must not be readily flammableD The chemical must not contain any inhibitor |  |
| 331 12.0-04 | Basic knowledge of chemistry | A |
|  | How might the self-reaction of a substance be initiated?A By heatingB By adding a stabilizerC By avoiding contamination from another cargoD By adding an inert gas |  |
| 331 12.0-05 | Basic knowledge of chemistry | C |
|  | How can reaction of the cargo with air be prevented?A By heating the cargoB By cooling the cargoC By wafting the cargo with an inert gasD By continuously moving the cargo around |  |
| 331 12.0-06 | Basic knowledge of chemistry | D |
|  | Which two types of substance have corrosive properties?A Alcohols and acidsB Alcohols and basesC Precious metals and basesD Acids and bases |  |
| 331 12.0-07 | Basic knowledge of chemistry | B |
|  | When a metal reacts with an acid, it releases a gas. Which one?A OxygenB HydrogenC MethaneD Chlorine |  |
| 331 12.0-08 | Basic knowledge of chemistry | C |
|  | What results from the complete combustion of propane?A Oxygen and hydrogenB Carbon monoxide and waterC Carbon dioxide and waterD Carbon and hydrogen |  |
| 331 12.0-09 | Basic knowledge of chemistry | B |
|  | What results from the incomplete combustion of propane?A Oxygen and hydrogenB Carbon monoxide and waterC Carbon dioxide and waterD Carbon and hydrogen |  |
| 331 12.0-10 | Basic knowledge of chemistry | A |
|  | How can a self-reaction of the cargo caused by oxygen be prevented?A By wafting it with an inert gasB By ensuring it is contaminated further C By heating itD By continuously decanting it |  |
| 331 12.0-11 | Basic knowledge of chemistry | A |
|  | What does adding an inhibitor prevent?A PolymerizationB BoilingC A fall in pressureD Condensation |  |
| 331 12.0-12 | Basic knowledge of chemistry | B |
|  | What results from the complete combustion of pentane?A Oxygen and hydrogenB Carbon dioxide and waterC Carbon and waterD Pentane oxide and water |  |
| 331 12.0-13 | Basic knowledge of chemistry | D |
|  | What results from the incomplete combustion of hexane?A Hexanol and waterB Carbon dioxide and waterC Oxygen and waterD Carbon monoxide and water |  |
| 331 12.0-14 | Basic knowledge of chemistry | B |
|  | A chemical reaction releases heat. What is this reaction called?A An endothermic reactionB An exothermic reactionC A heterogenic reactionD A homogenic reaction |  |
| 331 12.0-15 | Basic knowledge of chemistry | A |
|  | A reaction gives rise to a new substance. What is the term for such a reaction?A A chemical reactionB A physical reactionC A meteorological reactionD A logical reaction |  |
| 331 12.0-16 | Basic knowledge of chemistry | D |
|  | Auto-oxidation is a chemical reaction in which the substance itself supplies the component required for the reaction. What is the component?A Carbon dioxideB Carbonic acid gasC NitrogenD Oxygen |  |

|  Practice Examination objective 1: Measurements |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 332 01.0-01 | Maximum permissible concentration at the workplace | A |
|  | What is the maximum permissible concentration at the workplace?A A legally prescribed concentrationB A recommendation from the manufacturer of the dangerous substanceC A recommendation of UNECED A recommendation from a “gas” expert |  |
| 332 01.0-02 | Maximum permissible concentration at the workplace | B |
|  | The maximum permissible concentration at the workplace is accompanied by an “S”. What is the meaning of this “S”?A The abbreviation of the country where the limit value at the workplace is applicableB The toxic substance can be absorbed by the skinC The value is permittedD The substance can cause skin disease |  |
| 332 01.0-03 | Measuring the concentration of gas | C |
|  | A gas measurement test tube is marked “n=10”. What does this mean?A The margin for error of measurement with this test tube is 10 %B To obtain an exact value, 10 measurements should be takenC To carry out a measurement, 10 pumps should be done with the toximeterD The measured value should be multiplied by 10 |  |
| 332 01.0-04 | Basic general knowledge | C |
|  | Under normal conditions, what is the oxygen content of air?A 17 %B 19 %C 21 %D 22 % |  |
| 332 01.0-05 | Measuring the concentration of gas | A |
|  | A catalytic oxidation explosimeter is to be used to measure whether there are mixtures of explosive gases and air in a cargo tank. In this case, is the content of oxygen important as well?A Yes, the measurement is based on a combustion process. The content of oxygen influences the resultB No, when the oxygen content is under 21 % in the cargo tank to be measured, no explosive mixture of gas (vapour) and air can formC No, catalytic oxidation explosimeters work independently of oxygen contentD No, the measurement must be taken outside the cargo tank to be measured. Therefore, the oxygen content is of no importance |  |
| 332 01.0-06 | Measuring the concentration of gas | B |
|  | We want to measure if a gas mixture in a cargo tank is explosive. The limit value for deciding is 20 % less than the lower explosive limit. Why?A Because the explosive limit is highly dependent on the temperature and humidity in the cargo tankB To ensure that the gas concentration is indeed under the lower explosive limit throughout the entire tankC So that even when the voltage is too weak (nearly empty battery) a reliable measurement can still be takenD Because when the oxygen content changes the gas mixture is not immediately able to explode |  |
| 332 01.0-07 | Measuring the concentration of gas | A |
|  | Where will the highest toxic gas concentrations be measured in a cargo tank?A Depending on the density of the gas, either at the top or at the bottom of the cargo tankB The concentration is the same throughout the cargo tankC At the top of the cargo tank, as toxic gas is always lighter than airD At the bottom of the cargo tank, as toxic gas is always heavier than air |  |
| 332 01.0-08 | Deleted (10.12.2020) | C |
|  |  |  |
| 332 01.0-09 | Maximum permissible concentration at the workplace | B |
|  | The value of the maximum permissible concentration at the workplace is accompanied by a short-term value phase [TGG-15]. What does this mean?A That the weighted average time can be considered only after a period of 15 minutesB That the value of the maximum permissible concentration at the workplace may not be exceeded for more than 15 minutesC That the value of the maximum permissible concentration at the workplace must have the same value for at least 15 minutesD That the value of the maximum permissible concentration at the workplace is applicable only if work must be done with this substance for more than 15 minutes |  |
| 332 01.0-10 | Maximum permissible concentration at the workplace | C |
|  | What is the list of value assessments for the maximum permissible concentration at the workplace?A An assessment list established internationallyB An assessment list established at the level of continental EuropeC An assessment list established at the national levelD A non-binding assessment list |  |
| 332 01.0-11 | Measuring the concentration of gas | A |
|  | What should be done to check, using a gas concentration meter, whether explosive vapour-gas mixtures are present in a cargo tank?A The oxygen content should be taken into account or the result will not be reliableB Simply take the measurement, as the oxygen content is not importantC Measure only the toxicity or the result will not be reliableD First measure the oxygen content and the toxicity or the result will not be reliable |  |
| 332 01.0-12 | Maximum permissible concentration at the workplace | D |
|  | A measurement test tube bears the mark “n=10”. What does this mean?A The test tube may be reused after 10 minutesB The vapour should be left to act for 10 minutes before the result is readC The result of the measurement should be read within a maximum of 10 minutesD To obtain a reliable result 10 pumpings are required |  |
| 332 01.0-13 | Maximum permissible concentration at the workplace | C |
|  | The maximum permissible concentration is calculated for what period per 24 hours?A For 4 hoursB For 6 hoursC For 8 hoursD For 12 hours |  |
| 332 01.0-14 | Basic general knowledge | A |
|  | What is the meaning of 1 ppm?A 1 part per million partsB 1 part per massC 1 part per metric tonneD 1 part per milligram |  |

|  Practice Examination objective 2: Sampling techniques |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 332 02.0-01 | 1.2.1 | A |
|  | What is the correct description of a partly closed sampling device?A A device penetrating through the boundary of the cargo tank such that during sampling only a small quantity of gaseous or liquid cargo can escape from the cargo tankB A device penetrating through the boundary of the cargo tank but constituting a part of a closed system designed so that during sampling no gas or liquid may escape from the cargo tankC A device composed of an opening with a diameter of not more than 0.30 m fitted with a self-closing flame arresterD A device with which the substance under pressure is released into the test tube by a reduction valve |  |
| 332 02.0-02 | 3.2.3.2, Table C | B |
|  | The kind of sampling device that should be used for sampling is specified where?A ADN, Part 1B ADN, Part 3C The certificate of approvalD The instructions in writing |  |
| 332 02.0-03 | 7.2.4.22.4 | C |
|  | A sample is taken through a sampling device. For what safety reason should a nylon string never be used?A The string might break under the effect of the substanceB The cylinder may slip from the nylon stringC The use of a nylon string may result in an electrostatic chargeD The use of nylon string is prohibited by occupational safety provisions |  |
| 332 02.0-04 | 3.2.3.2, Table C | B |
|  | Following loading with UN No. 2486, ISOBUTYL ISOCYANATE, a sample must be taken. What kind of device must be used, at the very least?A A sampling deviceB A closed-type sampling deviceC A closed-type sampling device with a pressure-release lock chamberD A partly closed sampling device |  |
|  |  |  |
| 332 02.0-05 | 3.2.3.2, Table C | A |
|  | After loading a type N tank vessel with UN No. 1203, MOTOR SPIRIT or GASOLINE or PETROL, a sample must be taken. What kind of device must be used, at the very least?A A sampling deviceB A closed-type sampling deviceC A closed-type sampling device with a pressure-release lock chamber D A partly closed sampling device |  |
| 332 02.0-06 | 3.2.3.2, Table C, 7.2.4.16.8, 8.1.5 | B |
|  | What protective equipment must be worn during sampling with a closed-type sampling device?A None, as a closed-type device is being usedB Depending on the cargo, the same as used in other work during loading and unloadingC Only a breathing apparatusD Unknown, as no measurement has been taken |  |
| 332 02.0-07 | 1.2.1 | C |
|  | A sample is taken using a partly closed sampling device. How are the air and vapour that were in the test tube evacuated?A Through the loading pipeB By returning to the cargo tankC To the open air, through a discharge pipeD Through the vessel’s gas extraction pipes |  |
| 332 02.0-08 | 3.2.3.2, Table C | A |
|  | Some substances must be carried in type C tank vessels. What kind of sampling device should not be used for such substances?A An open-type sampling openingB A partly closed sampling deviceC A closed-type sampling deviceD A closed-type sampling device with a lock chamber |  |
| 332 02.0-09 | 7.2.4.22.3 | B |
|  | When must there be a 10-minute wait before a sample is taken from a cargo requiring marking with one or two blue cones?A AlwaysB When an open-type sampling opening is usedC When a partly closed sampling device is usedD Only when flammable liquids are involved |  |
| 332 02.0-10 | 3.2.3.2, Table C | D |
|  | When must a closed-type sampling device be used?A When substances are carried for which marking with one blue light or cone is requiredB When substances are carried for which marking with two blue lights or cones is requiredC When substances are carried for which marking with a blue cone or light is not requiredD When substances are carried for which the equipment in question is required in Table C |  |
| 332 02.0-11 | 7.2.4.22.3 Basic knowledge of physics | C |
|  | Under ADN, for some substances, sample openings may not be opened until 10 minutes after the loading has been interrupted. Why?A Because the pressure is reduced only after 10 minutesB Because the liquid in a cargo tank reaches a reasonable temperature only after 10 minutesC Because a possible electrostatic charge would be discharged only after 10 minutesD Because the safety measures can be taken only after 10 minutes |  |
| 332 02.0-12 | 1.2.1 | A |
|  | What is the purpose of a closed-type sampling device?A Prevent the release of gas into the environmentB Remove the least possible liquid from the cargoC Reduce evaporation, which means a loss of cargo, to a minimumD Obtain a pure sample |  |

|  Practice Examination objective 3: Cleaning of cargo tanks |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 332 03.0-01 | 7.2.3.44 | A |
|  | After unloading, a type C tank vessel has to clean its cargo tanks. The cleaning product has the following physical properties: boiling point 161 °C, melting point <-40 °C, flash point 36 °C. Can it be used?A Yes, according to ADN the use of cleaning products with a flash point <55 °C is allowed in the explosion hazardous areaB No, a cleaning product with the above physical properties has no grease diluting properties and is thus unsuitable for use as a cleaning productC No, according to ADN cleaning products should not be used to clean type-C tank vessel cargo tanksD No, according to ADN a cleaning product must have a flash point >60 °C |  |
| 332 03.0-02 | Cleaning the cargo tanks | B |
|  | What does it mean if a product is in the group of cleaning products known as “saponifying”?A An acid used as a cleaning product for tanksB It is a product that through a chemical reaction transforms an oily product into a soapy emulsionC It is a synthetic cleaning productD It is a device that, by adding water, transforms solid soap into liquid soap |  |
| 332 03.0-03 | Cleaning the cargo tanks | C |
|  | Sodium hydroxide (caustic acid) is what kind of cleaning product?A A detergentB An emulsionC A saponifying agentD An acidic cleaning product |  |
| 332 03.0-04 | Cleaning the cargo tanks | A |
|  | What name is given to the machines commonly used to clean tanks in inland navigation?A “Butterwash” machinesB Centrifugal sprinklersC NebulizersD Type-C sprinklers |  |
| 332 03.0-05 | 7.2.3.44 | B |
|  | Liquids with a flash point under 55 °C are used for cleaning. Where can such products be used?A In the engine roomB Only in the explosion hazardous areaC Only in the cargo tanksD Only on the deck, both in the explosion hazardous area and outside it |  |
| 332 03.0-06 | Cleaning the cargo tanks | D |
|  | What risk is to be avoided in steam cleaning a cargo tank containing explosive mixtures?A Heating of the cargo tankB OxidationC Increase in gas concentrationD Electrostatic charge |  |
| 332 03.0-07 | Cleaning the cargo tanks | A |
|  | What is a detergent?A A mixture of cleaning productsB An emulsifying agentC A synthetic soapD A solvent |  |
| 332 03.0-08 | Deleted |  |
| 332 03.0-09 | Cleaning the cargo tanks | D |
|  | The vessel was loaded with non-water-soluble substances. When the cargo tanks are cleaned, attention should be paid to:A Use external water for the cleaning so as to minimize the harmful effect on the environment B Hermetically close the cargo tank during cleaning to minimize the harmful effect on the environment C The temperature of the deck on the cargo tanks. If the deck becomes too hot it can affect the coating of the cargo tanksD Ensure that the spray of the tank cleaning equipment reaches all parts of the cargo tank |  |
| 332 03.0-10 | Deleted |  |
| 332 03.0-11 | Cleaning the cargo tanks | C |
|  | What is the only type of hose that may be used for cleaning cargo tanks?A A reinforced pressure-resistant hoseB A heat-resistant hose, because of the high temperaturesC A special tank-cleaning hose, to eliminate electrostatic chargesD A synthetic hose, to avoid corrosion |  |
| 332 03.0-12 | Cleaning the cargo tanks | D |
|  | After the cargo tank has been cleaned, it is ascertained that there are no more dangerous gases in the tank. Six hours later a new measurement is taken and a dangerous concentration is found. Why might this happen?A Very low boiling point of the substanceB Very low melting point of the substanceC Very low vapour density of the substanceD Very low vapour pressure of the substance |  |
| 332 03.0-13 | Cleaning the cargo tanks | C |
|  | Why are gas evacuation systems fitted with heating devices?A Because they facilitate cleaning of the cargo tanksB Because they have been tested for the products for which they are usedC To avoid crystallization of certain productsD For the automatic cleaning of the vapour pipes |  |
| 332 03.0-14 | Cleaning the cargo tanks | A |
|  | In cleaning a cargo tank, the least possible water should be used. Why?A To protect the environmentB It is better for the cargo tank wallsC Because some products react with waterD So that the soap concentration is as high as possible |  |
| 332 03.0-15 | Cleaning the cargo tanks | B |
|  | Before connecting the tank cleaning machine, the supply hoses should be rinsed thoroughly with water. Why is this necessary?A To bring the hoses to the right temperatureB To prevent detritus in the hoses from entering the tank cleaning machineC To see if the hoses are blockedD To see if the hoses have leaks |  |
| 332 03.0-16 | Cleaning the cargo tanks | A |
|  | The cleaning method and duration depend on:A The product, and the material and design of the cargo tankB The authorization of the competent authorityC The authorization of the cleaning companyD The viscosity of the cleaning product used |  |
| 332 03.0-17 | Deleted |  |
| 332 03.0-18 | Cleaning the cargo tanks | A |
|  | Cargo tanks that were loaded with substances that crystallize quickly have to be cleaned. To what should particular attention be paid?A If the gas evacuation systems and fittings systems are not insulated or heated they may clogB The tank cleaning machine’s operating system may become damaged by the formation of small crystalsC In winter the crystals evaporate quickly, which could thus result in an explosive mixture D Crystals are solids that should not be in the cleaning company’s storage tank |  |
| 332 03.0-19 | 7.2.3.1.4, 7.2.3.1.6 | D |
|  | Under ADN, what concentration of gas is acceptable for a person to enter a cargo tank to clean it? A Not more than 50 % of the lower explosive limitB Not more than 40 % of the lower explosive limitC Not more than 20 % of the lower explosive limitD Not more than 10 % of the lower explosive limit |  |
| 332 03.0-20 | Cleaning the cargo tanks | B |
|  | When a cargo tank is being steam cleaned, apart from the risk of electrostatic charge, what else requires attention?A That no cavitation should occur in the cargo tankB That no overpressure should occur in the cargo tankC That no cold water should enter the cargo tankD That no cleaning product should enter the steam |  |
| 332 03.0-21 | Cleaning the cargo tanks | C |
|  | The duration of steam treatment required to clean a cargo tank depends on:A The hardness of the water and the steam pressureB The cleaning products and the hardness of the waterC The cleaning products and the state of the cargo tankD The substance that is later to be loaded |  |
| 332 03.0-22 | 7.2.3.1.6 | C |
|  | Is a rescue winch required when a person enters a cargo tank to clean it if the tank has an insufficient oxygen content or contains dangerous concentrations of harmful substances?A No, a rescue winch is never requiredB Yes, a rescue winch is always requiredC Yes, a rescue winch is required if there are just three persons on boardD Yes, a rescue winch is required if there are just two persons on board |  |
| 332 03.0-23 | Cleaning the cargo tanks | B |
|  | After degassing and cleaning of a cargo tank, the slops not suitable for pumping must be removed. What requires your attention in this case?A Ensure there are enough pails availableB Be aware that the slops may release gasesC Ensure the tank cleaning device is kept at a distanceD Be aware that the slops may be poured into a residual cargo tank |  |
| 332 03.0-24 | Cleaning the cargo tanks | A |
|  | Class 3 slops not suitable for pumping have to be removed from a cargo tank. What devices may be used?A Only devices that do not produce sparksB Only devices specifically designed for the task and authorized by the European UnionC Any devicesD Only devices specifically designed for the task and authorized by UNECE |  |
| 332 03.0-25 | Cleaning the cargo tanks | A |
|  | During the cleaning of a tank, an explosive mixture of gas or vapour with air is formed. What should you do?A Immediately suspend cleaning and degas the tankB Reduce the spray pressure to generate less gasC Increase the spray pressure so that the vapours can more quickly escape from the cargo tankD Open the tank lid so that the gas can better escape |  |
| 332 03.0-26 | 7.2.3.1.6 | C |
|  | The cargo tanks have been emptied of a Class 3 substance. While sailing, the cargo tanks have to be cleaned. There are two people on board. Slops not suitable for pumping have to be removed from a cargo tank that has not been entirely degassed. A rescue winch manned by a person keeping watch is prepared. Is it permissible to enter the cargo tank?A Yes, if the appropriate protection measures are takenB No, during navigation no one may enter the cargo tanksC No, at least one more person able to lend assistance in an emergency must be within calling distanceD No, at least two other people able to lend assistance in an emergency must be within calling distance |  |
| 332 03.0-27 | Cleaning the cargo tanks | C |
|  | The cargo tanks have to be cleaned. Where is cleaning allowed?A Only in portB Only on the riverC The location does not matterD Only during navigation |  |

|  Practice Examination objective 4: Working with cargo residues (slops), cargo remains and residual cargo tanks |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 332 04.0-01 | 9.3.2.26.2 | A |
|  | According to ADN, each cargo tank or group of cargo tanks must be fitted with a gas evacuation system for the safe return ashore of gases expelled during loading. Does a residual cargo tank also have to be connected to a gas evacuation system?A No, the residual cargo tank must not be connected to the gas evacuation systemB Yes, alwaysC Yes, but only if there is actually residue in the residual cargo tankD Yes, but only if the residual cargo tank has no ullage opening fitted with a flame arrester |  |
| 332 04.0-02 | Working with cargo residues (slops) | B |
|  | Why is it advisable to separate glycols and alcohols from other substances when storing them in residual cargo tanks?A Glycols and alcohols are too fatty. They cannot later be separated from the other substancesB Glycols and alcohols are highly water soluble. They therefore have a high pollution load for the environmentC Glycols and alcohols react with water. Dangerous reactions should be expectedD Glycols and alcohols are not water soluble. They therefore have a high pollution load |  |
| 332 04.0-03 | Working with cargo residues (slops) | D |
|  | Two different products have to be pumped together into the same residual cargo tank. What should particular attention be paid to?A That the products have the same identification numberB That the products have the same nameC That the products neutralize one anotherD That the products do not react with one another |  |
| 332 04.0-04 | 9.3.2.26.2 | C |
|  | What is the maximum capacity of the residual cargo tank?A 10 m3B 20 m3C 30 m3D 50 m3 |  |
| 332 04.0-05 | 1.2.1 | D |
|  | Is it necessary to be able to close slops tanks with lids?A No, but they must be fire resistantB No, but they must be marked and easy to handleC Yes, but only when the capacity is greater than 2 m3D Yes |  |
| 332 04.0-06 | 7.2.4.1.1, 9.3.2.26.1 | C |
|  | Intermediate bulk containers (IBCs), tank-containers or portable tanks may also be used instead of fixed residual cargo tanks. What is the maximum total capacity authorized for all receptacles for residual products or slops?A 20.00 m3B 10.00 m3C 12.00 m3D 30.00 m3 |  |
| 332 04.0-07 | Deleted (2012) |  |
| 332 04.0-08 | Cargo residues | C |
|  | Where can cleaning waste water and slops be put?A Any unloading berthB Any loading berthC Only locations authorized by the competent authorityD Any refuelling station |  |
| 332 04.0-09 | 7.2.3.7.1.5, 7.2.3.7.2.5 | D |
|  | The master decides that the blue cone can be removed. Should the residual cargo tank too be free from gases?A Yes, as the residual cargo tank is one of the cargo tanks, and the cargo tanks must be free from gases (less than 10 % of the lower explosive limit)B Yes, as a residual cargo tank that is not free from gases is a hazardC No, as no gas can be expelled from a residual cargo tankD No, as according to ADN it is only in the cargo tanks that gases must be under 20 % of the lower explosive limit |  |
| 332 04.0-10 | 9.3.2.26.1 | B |
|  | Where should the receptacle for residual products be located on the deck of a tank vessel of type C?A Always below deck in the cargo area at a minimum distance from the hull equal to one quarter of the vessel’s breadthB In the cargo area at a minimum distance from the hull equal to one quarter of the vessel’s breadthC Always below deck in the cargo areaD According to ADN, there is no requirement |  |

|  PracticeExamination objective 5: Degassing |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 332 05.0-01 | 7.2.3.7.1.1, 7.2.3.7.1.2 | A |
|  | Unloaded tanks that have contained substances of Class 6.1 must be degassed into the atmosphere. Where is this always permitted?A At the locations where it is permitted by the competent authorityB Always during navigation, but the tank lids should remain closedC Always during navigation, except within the area of locks and their lay-bysD Always during navigation, but degassing should be carried out using a ventilation device |  |
| 332 05.0-02 | 7.2.3.7.1.2 | B |
|  | Cargo tanks have contained UN No. 2054, MORPHOLINE. For degassing while under way, what is the maximum allowable concentration of flammable gases and vapours in the vented mixture at the outlet?A Less than 1 % of the lower explosive limitB Less than 10 % of the lower explosive limitC Not more than 20 % of the lower explosive limitD Less than 50 % of the lower explosive limit |  |
| 332 05.0-03 | 7.2.3.7.1.4 | C |
|  | When the concentration of flammable gases and vapours in front of the accommodation reaches what level should degassing operations of empty cargo tanks into the atmosphere be interrupted?A At a concentration of more than 1 % of the lower explosive limitB At a concentration of more than 10 % of the lower explosive limitC At a concentration of more than 20 % of the lower explosive limitD At a concentration of more than 50 % of the lower explosive limit |  |
| 332 05.0-04 | 7.2.3.7.1.2, 7.2.3.7.1.3 | D |
|  | May degassing into the atmosphere be carried out in the lay-by of a lock?A Yes, but all stipulations in respect of degassing should be respectedB Yes, but only if the lay-by is not within a densely populated areaC Yes, but only if there is no risk involved for the crewD No, degassing in this area is prohibited in all circumstances |  |
| 332 05.0-05 | 7.2.3.7.1.2 | B |
|  | Cargo tanks have contained a substance of Class 6.1, secondary danger 3. It is not practicable to carry out degassing into the atmosphere at the location designated or approved for this purpose by the competent authority. During degassing while the vessel is under way in normal circumstances, what is the maximum allowable concentration of flammable gases and vapours in the vented mixture at the outlet?A Not more than 1 % of the lower explosive limitB Not more than 10 % of the lower explosive limitC Not more than 20 % of the lower explosive limitD Not more than 50 % of the lower explosive limit |  |
| 332 05.0-06 | 7.2.3.7.1.6, 7.2.3.7.2.6, 8.3.5 | D |
|  | Outside the cargo area, you wish to carry out repair or maintenance work requiring the use of an open flame. Is this permitted during degassing?A Yes, but only if the doors and openings of the service spaces in question are closedB Yes, this is permitted in the service spaces outside the cargo area in all circumstancesC Yes, outside the cargo area there is no need for an authorization from the competent authorityD No |  |
| 332 05.0-07 | 7.2.3.7.1.1 | A |
|  | Who is competent to designate locations where degassing into the atmosphere is permitted?A The competent authorityB The vessel’s inspection bodyC The medical serviceD The river police |  |
| 332 05.0-08 | 8.3.5, 7.2.3.7.1.6, 7.2.3.7.2.6 | C |
|  | When is a certificate attesting to the totally gas-free condition of the vessel required on board? A Before the blue cone(s) or blue light(s) may be withdrawn after unloadingB After unloading, before another substance may be loadedC Before repairing the hull at a shipyardD Before entering a cargo tank |  |
| 332 05.0-09 | Deleted (19.09.2018) |  |
| 332 05.0-10 | Deleted (19.09.2018) |  |
| 332 05.0-11 | 8.1.2.1 (g), 7.2.3.7.1.5, 7.2.3.7.2.5 | C |
|  | After effecting measurements, the master decides of his own accord to withdraw the blue cone(s) or blue light(s). What else should he do?A He need do nothing elseB He must communicate the measurement results to the nearest competent authorityC He must record the measurement results in the bookD He must inform the river police of his decision |  |
| 332 05.0-12 | 7.2.3.7.1.5, 7.2.3.7.2.5 | B |
|  | What parts of the vessel should be degassed before the master may withdraw the blue cone(s) or blue light(s)?A All the cargo tanks, pipes for loading and unloading, residual cargo tanks and unloading pumps B All the cargo tanksC All the cargo tanks and pipes for loading and unloadingD All the cargo tanks and residual cargo tanks |  |

|  PracticeExamination objective 6: Loading, unloading |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 332 06.0-01 | 9.3.2.21.1 | B |
|  | The cargo tanks of a tank vessel of type C should be provided with a mark inside the tank indicating the degree of filling. At what degree of filling should it be set?A 90 %B 95 %C 97.5 %D 98 % |  |
| 332 06.0-02 | 9.3.2.21.1 | C |
|  | Each cargo tank of a tank vessel of type C should be provided with a high level sensor for actuating the facility against overflowing. At what degree of filling should the sensor be set to actuate at the latest?A 90 %B 95 %C 97.5 %D 98 % |  |
| 332 06.0-03 | 9.3.2.21.1 | A |
|  | Each cargo tank of a tank vessel of type C should be provided with an alarm. What is the degree of filling at which the alarm should activate at the latest?A 90 %B 95 %C 97.5 %D 98 % |  |
| 332 06.0-04 | 1.2.1 | D |
|  | What is the function of a high-velocity venting device?A To enable cargo samples to be collected rapidly from a tank without having to open itB To protect a cargo tank against a possible explosion in the gas evacuation pipeC To activate an alarm at a degree of filling of 97.5 % and thus serve as a guarantee against overflowingD To prevent unacceptable overpressure in the cargo tanks |  |
| 332 06.0-05 | 7.2.4.16.12 | B |
|  | What is the function of a flame arrester?A To remove gases during loading and regulate pressure variations in the cargo tanksB To protect a cargo tank against a possible detonation in the gas evacuation pipeC To control the pressure in the gas evacuation pipe during loading, unloading, cleaning and transportD To serve as a guarantee against overflowing, activating at 97.5 % |  |
| 332 06.0-06 | 3.2.3.2, Table C | C |
|  | UN No. 1098, ALLYL ALCOHOL has to be transported. What is the minimum allowable setting of the high‑velocity venting devices?A 10 kPaB 20 kPaC 40 kPaD 50 kPa |  |
| 332 06.0-07 | 1.2.1 | A |
|  | What is the advantage of a stripping system?A To ensure little cargo residue remains in the cargo tanks and in the pipes for loading and unloadingB To avoid the need to clean the tanks between the unloading of one substance and the loading of another, different one C To ensure large quantities of residual cargo remain in the cargo tanksD To avoid the need to empty the pipes for loading and unloading |  |
| 332 06.0-08 | 9.3.2.25.2 | C |
|  | Are pipes for loading and unloading permitted below deck?A Yes, if they have the proper markingB Yes, if they are positioned a quarter of the vessel’s breadth from the hullC No, unless they are located inside the cargo tanks or inside the pump-roomD No, this is never permitted |  |
| 332 06.0-09 | Deleted (2007) |  |
| 332 06.0-10 | 3.2.3.2, Table C | B |
|  | UN No. 2218, ACRYLIC ACID, STABILIZED has to be transported. What is the maximum degree of filling permitted?A 91 %B 95 %C 97 %D 98 % |  |
| 332 06.0-11 | 3.2.3.2, Table C | C |
|  | UN No. 2218, ETHANOLAMINE has to be transported. What is the maximum degree of filling permitted?A 91 %B 95 %C 97 %D 98 % |  |
| 332 06.0-12 | 3.2.3.2, Table C | D |
|  | UN No. 1208, n-HEXANE has to be transported. What is the minimum allowable setting of the high-velocity vent valve?A 50 kPaB 35 kPaC 25 kPaD 10 kPa |  |
| 332 06.0-13 | 3.2.3.2, Table C | B |
|  | UN No. 2023, EPICHLOROHYDRIN has to be transported. What type of sampling device, at the very least, should be available for samples to be taken?A A closed sampling deviceB A partly closed sampling deviceC An open-type sampling openingD For this substance, the type of sampling device is not prescribed |  |
| 332 06.0-14 | 9.3.2.21.5 | A |
|  | Can the high-level sensor to prevent overflowing be connected to the level alarm device?A No, but it may be connected to the level gaugeB Yes, and it may also be connected to the level gaugeC Yes, it may be dependent on the level alarmD Yes, it should be dependent on the level alarm |  |
| 332 06.0-15 | Basic general knowledge | C |
|  | Why is the float of some level gauges equipped with a magnet?A To allow for two measurements to be taken simultaneouslyB To ensure that the float always remains on the cargo surfaceC To provide a separation between the cargo and the measuring device in order to protect against explosionsD To enable lowering of the float during unloading |  |
| 332 06.0-16 | 1.2.1 | B |
|  | What is the function of a gas discharge pipe or gas return pipe or piping?A Such pipes collect the gas formed during transportB Such pipes evacuate to the shore facility the gases and vapours which form during loading C Such pipes evacuate to the cargo tank being loaded the gases and vapours which form during loading D Such pipes are only found on tank vessels of type G and are intended to carry certain gases |  |
| 332 06.0-17 | Cubic expansion coefficient | B |
|  | A cargo tank contains 20,000 litres of a substance at a temperature of 8 °C. The temperature of the cargo is brought to 50 °C. The expansion coefficient of the substance is 0.001  K-1. What is the new volume?A 19,160 litresB 20,840 litresC 21,000 litres D 22,520 litres |  |
| 332 06.0-18 | Cubic expansion coefficient | B |
|  | 3,000 litres of aniline are at a temperature of 2 °C. The expansion coefficient of aniline is 0.00084 °K-1. What is the volume of this quantity of aniline at 20 °C?A 2,955 litresB 3,045 litresC 3,136 litresD 3,733 litres |  |
| 332 06.0-19 | Deleted (2011) |  |
| 332 06.0-20 | 7.2.4.24 | B |
|  | May the fuel tanks be filled while a tank vessel is being unloaded? A Yes, since unloading of cargo tanks and refuelling are not relatedB No, unless the competent authority has granted an exceptionC No, since during loading and unloading, nothing else may be loadedD This is not permitted unless the supply vessel has a certificate of approval |  |
| 332 06.0-21 | 7.2.4.11.2 | C |
|  | May different dangerous goods be transported simultaneously in a tank vessel if the vessel meets the relevant technical requirements?A NoB Yes, but only with the approval of the competent authorityC YesD Yes, but no more than two different dangerous goods may be loaded simultaneously |  |
| 332 06.0-22 | 7.2.4.21.3 | A |
|  | On what does the maximum degree of filling of a cargo tank depend?A On the relative density of the substance to be transported and the maximum allowable density indicated in the certificate of approvalB On the type of tank vessel and the maximum allowable relative density indicated in the certificate of approvalC On the opening pressure of the high-velocity vent valve and the relative density of the substance D On the type of tank vessel and the opening pressure of the high-velocity vent valve |  |
| 332 06.0-23 | 3.2.3.2, Table C | D |
|  | UN No. 1167, DIVINYL ETHER, STABILIZED must be loaded onto a tank vessel. Should the air first be evacuated from the cargo tanks and loading and unloading pipes by means of inert gases?A No, this is not necessary for this substanceB No, since it is a substance of Class 3, this operation is not necessaryC Yes, since it is a substance of packing group ID Yes, since this is prescribed in Column (20) of Table C |  |
| 332 06.0-24 | 3.2.3.2, Table C | A |
|  | UN No. 1218, ISOPRENE, STABILIZED must be loaded onto a tank vessel. Should the air first be evacuated from the cargo tanks and loading and unloading pipes by means of inert gases?A Yes, since this is prescribed in Column (20) of Table CB No, this is prescribed only for substances of Class 6.1C Yes, since it is a substance of packing group ID No, this is not necessary for this substance |  |
| 332 06.0-25 | 3.2.3.2, Table C | D |
|  | UN No. 1307, XYLENES must be loaded onto a tank vessel. Should the air first be evacuated from the cargo tanks and loading and unloading pipes by means of inert gases?A Yes, since this is prescribed in Column (20) of Table CB No, this is only prescribed for substances of Class 6.1C No, this is only prescribed for substances of packing group ID No, this is not necessary for this substance |  |
| 332 06.0-26 | 7.2.4.21.3 | A |
|  | UN No. 1593, DICHLOROMETHANE must be loaded onto a tank vessel. The certificate of approval sets the permissible relative density at 1.1. What is the degree of filling in this case?A 82.7 %B 95 %C 97 %D 97.5 % |  |
| 332 06.0-27 | 7.2.4.21.3 | C |
|  | UN No. 1708, TOLUILIDINES, LIQUID must be loaded onto a tank vessel. The certificate of approval sets the permissible relative density at 1.1. What is the degree of filling in this case?A 90.9 %B 91 %C 95 %D 97 % |  |
| 332 06.0-28 | 7.2.4.21.3 | C |
|  | UN No. 1848, PROPIONIC ACID must be loaded onto a tank vessel. The certificate of approval sets the permissible relative density at 1.0. What is the degree of filling in this case?A 96 %B 95 %C 97 %D 99 % |  |
| 332 06.0-29 | 1.4.3.3 (m), 7.2.4.10 | A |
|  | Loading is about to start. So far the checklist has been signed only by the master. The person in charge of the loading installation assures you that he will sign it after loading. Is this permitted?A No, it is not permittedB No, only if the new cargo is not the same as the previous cargoC Yes, because the checklist has already been signed by the masterD Yes, as the master knows what he is loading |  |
| 332 06.0-30 | Deleted (2011)  |  |
| 332 06.0-31 | 7.2.3.20.1, 9.3.2.11.5 | D |
|  | On a tank vessel of type C, may the double-hull spaces and double bottoms be used for ballasting purposes?A Yes, without any restrictions, during transport of substances for which type C is not prescribed B No, not even for empty journeysC No, double-hull spaces and double bottoms should in all circumstances be kept dry and may thus not contain any ballast installationsD Yes, if this is taken into account in the stability calculations and is not prohibited by Table C |  |
| 332 06.0-32 | 9.3.2.25.8 (b) | D |
|  | A tank vessel of type C is equipped with piping to collect water ballast in a cargo tank. With what should the junction between the loading and unloading pipes be fitted?A A high-velocity vent valveB An automatic shut-off valveC A flame-arresterD A non-return valve |  |
| 332 06.0-33 | 3.2.3.2, Table C | B |
|  | Which of the following substances crystallizes at temperatures of around 6 °C?A UN No. 1090, ACETONEB UN No. 1114, BENZENEC UN No. 1125, n-BUTYLAMINED UN No. 1282, PYRIDINE |  |
| 332 06.0-34 | 3.2.3.2, Table C | D |
|  | Which of the following substances may be transported at temperatures below 4 °C when heating is not possible?A UN No. 1114, BENZENEB UN No. 1145, CYCLOHEXANEC UN No. 1307, XYLENES (p-XYLENE)D UN No. 2055, STYRENE MONOMER, STABILIZED |  |
| 332 06.0-35 | Inerting | C |
|  | During the transport of dangerous goods, a layer of nitrogen is sometimes placed above the cargo. Why is this?A To prevent movement of the cargoB To cool the cargoC To isolate the cargo from the external airD To maintain the temperature of the cargo at a constant level |  |

|  Practice**Examination objective 7: Heating** |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 332 07.0-01 | 3.2.3.2, Table C | A |
|  | Is it advisable to heat a cargo of UN No. 2348, n-BUTYL ACRYLATE, STABILIZED during transport?A No, since this could cause polymerizationB Yes, as long as no gases form in the cargoC Yes, since the substance is stabilizedD Yes, since this facilitates pumping of the substance |  |
| 332 07.0-02 | Temperature action | B |
|  | When is it advisable to heat certain substances?A If they polymerize readilyB If they have a very high viscosityC If they are self-reactiveD If they decompose readily |  |
| 332 07.0-03 | Temperature action | C |
|  | When is it advisable to heat certain substances?A If they are thermally unstableB If they emit a lot of gasC If they could solidify during loadingD If they decompose readily |  |
| 332 07.0-04 | 3.2.3.2, Table C | D |
|  | Is it advisable to heat UN No. 1999, TARS, LIQUID?A No, since it is highly explosiveB No, since it has a very low solidification pointC No, since this could result in polymerizationD Yes, since it should not be allowed to solidify. The temperature during carriage should be kept above the melting point |  |
| 332 07.0-05 | 3.2.3.2, Table C | D |
|  | A cargo tank is loaded with UN No. 1831, SULPHURIC ACID, FUMING. Can the heating coils in this cargo tank contain water?A Yes, since fuming sulphuric acid does not react with waterB Yes, the heating coils can always contain waterC No, during transport of a substance that does not require heating, the heating coils should never contain waterD No, this is prohibited during the transport of fuming sulphuric acid |  |
| 332 07.0-06 | 3.2.3.2, Table C | C |
|  | A vessel is carrying UN No. 2448, SULPHUR, MOLTEN. What is the maximum allowable temperature of the cargo during transport?A 100 ºCB 120 ºCC 150 ºCD 250 ºC |  |
| 332 07.0-07 | 3.2.3.2, Table C | C |
|  | Where in ADN can information on a substance’s relative density be found?A In section 3.2.1, Table AB In section 3.2.2, Table BC In section 3.2.3.2, Table CD ADN does not contain any information on the relative density of substances |  |
| 332 07.0-08 | Temperature action | A |
|  | The temperature correction factor allows the loaded tonnage to be calculated from the volume in m3. From where can the correction factor obtained?A The loading installationB The instructions in writingC The traffic control authorityD The certificate of approval |  |
| 332 07.0-09 | 7.2.4.21.2 | A |
|  | A cargo at elevated temperature, e.g. 75 °C, is loaded. The cargo should be kept at this temperature during transport. May the maximum degree of filling be exceeded in this case?A No, since space is required in the cargo tank in case the temperature should rise furtherB Yes, since the maximum degree of filling is prescribed for 15 °CC Yes, since the temperature will fall rather than riseD No, unless the relative density of the substance is lower than the density specified in the certificate of approval |  |
| 332 07.0-10 | 3.2.3.2, Table C | B |
|  | A tank vessel is equipped with only one possibility of heating cargo. May it transport UN No. 1764, DICHLOROACETIC ACID at an external temperature of 12 °C?A No, the vessel should be equipped with a heating installation on boardB Yes, this is permittedC No, below this external temperature, the substance may not be transported in any circumstancesD No, this is not permitted since the temperature of the substance should be kept at exactly 14 °C and this is not possible without a heating installation on board |  |
| 332 07.0-11 | 3.2.3.2, Table C | C |
|  | A cargo tank is loaded with UN No. 2796, BATTERY FLUID, ACID. Can the heating coils be filled with water?A Yes, if the heating coils are properly closedB Yes, the heating coils should always be filled with waterC No, this is prohibited during transport of this substanceD No, during unheated transport, the coils should never contain water |  |
| 332 07.0-12 | 3.2.3.2, Table C | A |
|  | A cargo tank is loaded with UN No. 2683, AMMONIUM SULPHIDE SOLUTION. Can the heating coils be filled with water?A Yes, if the heating coils are properly closedB Yes, since the cargo should be able to be heatedC No, this is prohibited during transport of this substanceD No, during unheated transport the coils should never contain water |  |

|  Emergency measuresExamination objective 1: Personal injury |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 333 01.0-01 | First aid | A |
|  | What should be done first if someone gets a chemical substance in their eye?A Rinse with water at length then see a doctorB See a doctor immediatelyC Rinse brieflyD Rub with hands and then see a doctor |  |
| 333 01.0-02 | First aid | B |
|  | What do you need in order to be able to provide the best first aid?A ADN certificateB Valid first-aid certificateC ADN “chemicals” certificateD Certificate of attendance at a fire-fighting course |  |
| 333 01.0-03 | First aid | D |
|  | Someone has lost consciousness after swallowing a toxic substance. Can the victim be given a drink?A Yes, as this will clean out the mouth and may dilute the substance in the stomachB Yes, but it must be done very slowlyC Yes, but you must get the victim to sit upD No, you must never give a drink to a victim who has lost consciousness |  |
| 333 01.0-04 | First aid | D |
|  | Following a burn, the victim’s clothes are stuck to the skin. Should the clothes be pulled off?A Yes, as you will then be better able to cool the skin downB Yes, as the clothes may be dirtyC Yes, but you must cool the victim at the same timeD No, opening up burn blisters increases the risk of infection |  |
| 333 01.0-05 | First aid | A |
|  | Why is it often recommended that someone who has swallowed a toxic substance should drink water?A To dilute the contents of the stomachB To stay consciousC To induce vomitingD To rinse the mouth out |  |
| 333 01.0-06 | First aid | A |
|  | Why must vomiting not be induced when the patient has swallowed certain toxic substances?A Because the substance then returns to the oesophagus, which will cause further injuryB Because the substance is not causing any damage to the stomachC Because the substance is rapidly diluted by the gastric acid and, consequently, vomiting is unnecessaryD Because during vomiting the contents of the stomach may reach the bronchial tubes |  |
| 333 01.0-07 | First aid | B |
|  | A crew member has lost consciousness because of a substance. What must you never do?A Move the patientB Attempt to get the patient to swallow waterC Lie on top of the patientD Try to bring the patient round with cold water |  |

|  Emergency measuresExamination objective 2: Material damage |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 333 02.0-01 | Measures in case of damage | A |
|  | Where can the provisions on the “do not approach” signal be found?A In CEVNIB In ADN, part 1C In ADN, part 2D In the technical construction requirements |  |
| 333 02.0-02 | Measures in case of damage | C |
|  | Toxic gas has been released as a result of damage. How can the concentration of this gas be determined so as to ascertain whether the maximum permissible values in ppm have been exceeded?A With an oxygen meterB With a flammable gas detectorC With a toximeterD With a Geiger counter |  |
| 333 02.0-03 | Measures in case of damage | D |
|  | During loading a leak was noticed in one of the loading hoses. What should be done first?A Move all unauthorized persons to a safe distanceB Inform the competent authorityC Measure the concentration of gas and toxicityD Stop loading immediately |  |
| 333 02.0-04 | Measures in case of damage, 1.4.1.2 | A |
|  | A vessel sustains serious damage. Who should be informed first?A The competent authorityB The client for whom the cargo is destinedC The consignorD The producer of the substance loaded |  |
| 333 02.0-05 | Measures in case of damage | C |
|  | An accident occurs with the hazardous substance being transported. Who can provide further information on the substance?A The competent authorityB The fire servicesC The consignor of the substanceD The shipper |  |
| 333 02.0-06 | First aid, 7.2.3.1.6 | D |
|  | A person equipped with the statutory protective clothing and equipment enters a cargo tank with an oxygen content of less than 20 % by volume. The person is seen lying unconscious in the cargo tank. What should be done?A Someone should enter the tank as quickly as possible to rescue the personB Someone wearing the relevant protective clothing and equipment should go in as quickly as possible to rescue the individualC Someone should prepare the rescue winch and then, wearing the relevant protective clothing, should go in as quickly as possible to rescue the individual D Someone should first summon the two other persons aboard and then, wearing the relevant protective clothing and equipment, should go in to rescue the individual |  |

|  Emergency measuresExamination objective 3: Environmental damage |
| --- |
| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 333 03.0-01 | Emergency measures in case of a leak | A |
|  | Gas escapes through a leak. What in particular will determine the behaviour of the cloud of gas?A The relative density of the gasB The conductivity of the gasC The boiling point of the gasD The maximum workplace concentration of the gas  |  |
| 333 03.0-02 | Emergency measures in case of a leak | D |
|  | What will not determine the speed of evaporation of a liquid that escapes?A The size of the surface of the liquid B The temperature of the liquidC The speed at which the vapour is carried off by the windD The maximum workplace concentration of the gas |  |
| 333 03.0-03 | Emergency measures in case of a leak | C |
|  | While the loading hose is being connected, a corrosive liquid runs out of the hose onto the deck. What should be done first?A The liquid should be removed by copiously flushing with waterB The liquid should be removed by copiously flushing with water and the competent authority informed so that further measures can be takenC It should be attempted to confine the liquid and absorb it with the equipment designed for that purposeD The liquid should be removed by flushing and the deck cleaned with soap |  |
| 333 03.0-04 | Basic general knowledge | D |
|  | Where should drums containing residue (slops) be emptied?A At a lock, in a tank provided for the purposeB At a refuelling firmC At an appropriate loading berthD At a firm certified by the competent authority |  |
| 333 03.0-05 | Basic general knowledge | A |
|  | Where should used measurement test tubes be put?A In a container for chemical wasteB In the dustbinC Back to the supplier of the test tubes onlyD They should be kept in order to prove that the measurements have been taken if the authorities carry out an inspection |  |

|  Emergency measuresExamination objective 4: Damage-control plans |
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| *Number* | *Source* | *Correct answer* |
|  |  |  |
| 333 04.0-01 | Damage-control and alert plans | D |
|  | When must a damage-control and alert plan be drawn up?A It is advisable to do this immediately after a disasterB At the moment the disaster occurs, so as to know what to do in that situationC Immediately before a disaster is expected, so as to be well prepared for the situationD It is advisable to have a damage-control and alert plan available so as to be always prepared for disasters |  |
| 333 04.0-02 | Damage-control and alert plans | A |
|  | What is not normally included in a damage-control and alert plan?A The substance being transportedB The need to inform the competent authority C The possibility that it may be necessary to activate the “do not approach” signal D The need to keep unauthorized persons away |  |
| 333 04.0-03 | Damage-control and alert plans | C |
|  | What is not normally included in a damage-control and alert plan?A The need to keep personal protective equipment on hand ready for useB The need to have fire-fighting equipment availableC The name of the product to be transportedD The need to inform the competent authority  |  |
| 333 04.0-04 | Damage-control and alert plans | D |
|  | What is it no longer obligatory to do if a vessel is involved in a serious collision?A Inform the competent authorityB If necessary activate the “do not approach” signalC If necessary close all openingsD Draw up a damage-control and alert plan |  |
| 333 04.0-05 | Damage-control and alert plans | C |
|  | What should be done first after a collision that has caused leakage of hazardous substances?A Inform the competent authorityB Alert other vessels in the area by radioC Activate the “do not approach” signalD Anchor the vessel in order to assess the damage |  |
| 333 04.0-06 | Damage-control and alert plans, 7.2.3.1.3, 7.2.3.1.6 | B |
|  | What should be done first when a leak is suspected in a wing tank and needs to be inspected?A The vessel should be immobilized and the tank entered for inspectionB The vessel should be immobilized, measurements taken, the appropriate steps taken in the light of those measurements and the tank entered for inspection C The vessel should be immobilized, the competent authorities informed and waited forD The vessel should be immobilized, the competent authority informed, measurements taken, the appropriate steps taken in the light of those measurements and the tank entered for inspection |  |

1. \* Distributed in German by the Central Commission for the Navigation of the Rhine in document CCNR-ZKR/ADN/WP.15/AC.2/2021/11. [↑](#footnote-ref-1)
2. \*\* In accordance with the programme of work of the Inland Transport Committee for 2021 as outlined in the proposed programme budget for 2021 (A/75/6 (Sect. 20), para. 20.51). [↑](#footnote-ref-2)