

2079 Level 2 Award in F-Gas Regulations

Sample Questions



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1 About this document

This document contains sample multiple choice questions to cover the four online multiple choice (GOLA) tests for the 2079 Level 2 Award in F-Gas Regulations.

The relevant units are

- | | |
|----------|---|
| 2079-101 | Knowledge assessment of F-Gas & ODS Regulations: Category I – leak checking, recovery, installation, service and maintenance of equipment. |
| 2079-201 | Knowledge assessment of F-Gas & ODS Regulations: Category II – installation, service and maintenance of equipment with a charge of less than 3 kg (6 kg if hermetically sealed) and leakage checking. |
| 2079-301 | Knowledge assessment of F-Gas & ODS Regulations: Category III – recovery of refrigerant. |
| 2079-401 | Knowledge assessment of F-Gas & ODS Regulations: Category IV – leakage checking. |

2 Objective mapping

All four 2079 GOLLA tests are drawn from the same pool of questions. Each unit has a different test specification, but many of the outcomes appear in more than one test.

The primary references for the sample questions in this document correspond with the references from the 2079-101 test specification. The table below demonstrates how these can be translated for candidates sitting the 201, 301 or 401 examinations.

The full test specifications for all four 2079 units is shown in full at the end of this document.

Unit 101	Unit 201	Unit 301	Unit 401
01.01	01.01		01.01
01.02	01.02		
01.03	01.03		
01.04	01.04		
01.05	01.05		
01.06	01.06		
01.07			
02.01	02.01	01.01	02.01
02.02	02.02	01.02	02.02
02.03	02.03	01.03	02.03
02.04	02.04	01.04	02.04
03.01	03.01		03.01
04.01	04.01		04.01
05.01	05.01	02.01	
06.01	06.01		
06.02			
07.01	07.01		
07.02			
08.01	08.01		
08.02			
09.01	09.01		
09.02			
10.01	10.01	03.01	05.01
10.02	10.02	03.02	05.02
11.01	11.01	04.01	06.01
11.02	11.02		
11.03	11.03		

3 Sample questions

Reference 01.01

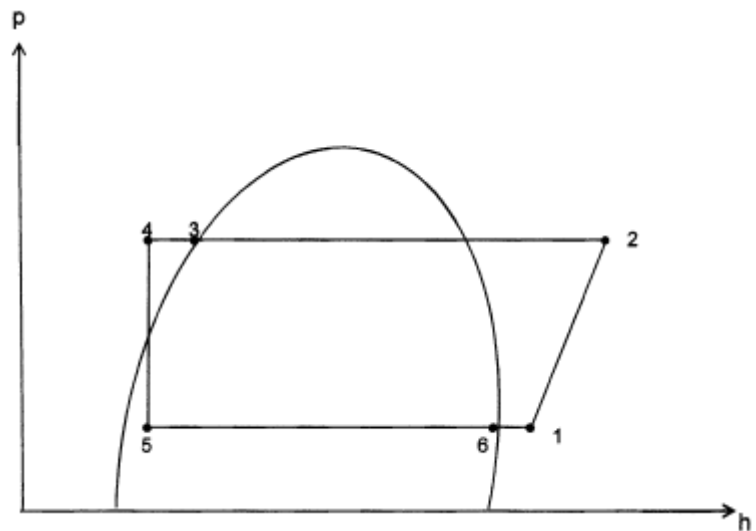
Which one of the following terms describes enthalpy?

- a) Heat content per unit volume.
- b) Heat content per unit temperature.
- c) Heat content per unit mass.
- d) Heat content per unit time.

Reference 01.02

On the diagram shown, process line 5 to 6 represents

- a) suction line superheat
- b) refrigeration effect
- c) compressor 'work done'
- d) liquid line sub cooling.



Reference 01.03

The function of an evaporative condenser is to

- a) absorb sensible heat to change vapour to liquid
- b) reject sensible heat to change vapour to liquid
- c) absorb latent heat to change vapour to liquid
- d) reject latent heat to change vapour to liquid.

Reference 01.04

Subcooling is established when

- a) refrigerant liquid is cooled below it's boiling point
- b) condenser fan speed is increased
- c) liquid injection is fitted to a system
- d) the condensing temperature is reduced

Reference 01.05

The most efficient operating temperatures for a chill coldroom designed to maintain a space temperature of +2°C with 'air on' to the condenser at 32°C are

- a) evaporating at -8°C and condensing at + 48°C
- b) evaporating at -8°C and condensing at + 50°C
- c) evaporating at -8°C and condensing at + 52°C
- d) evaporating at -8°C and condensing at + 54°C.

Reference 01.06

Which one of the following refrigerants is **most** likely to suffer from changes in it's composition after leakage from a static system?

- a) R22.
- b) R134a.
- c) R245fa.
- d) R407C.

Reference 01.07

Which of the following refrigerant conditions will provide a clear liquid line sight glass?

- a) Saturated liquid and saturated vapour.
- b) Saturated two phase mixture.
- c) Subcooled liquid.
- d) Superheated liquid.

Reference 02.01**01.01 for unit 301 candidates**

Which one of the following environmental issues is addressed by the Kyoto Protocol?

- a) Ozone depletion.
- b) Volatile organic compounds.
- c) Climate change.
- d) Heavy oil particulates.

Reference 02.02**01.02 for unit 301 candidates**

Which one of the following refrigerants has least impact on direct global warming?

- a) R134a
- b) R404A
- c) R717
- d) R744

Reference 02.03

01.03 for unit 301 candidates

- a) The Energy Efficiency Ratio of a heat pump system is found from?
- a) Heating capacity x compressor motor input power
 - b) Heating capacity x total system input power
 - c) Heating capacity
Compressor motor input power
 - d) Heating capacity
Total system input power
- b) As the difference between condensing temperature and evaporating temperature decreases
- a) Work done decreases and discharge temperature decreases
 - b) Work done decreases and discharge temperature increases
 - c) Work done increases and discharge temperature decreases
 - d) Work done increases and discharge temperature increases

Reference 02.04

01.04 for unit 301 candidates

Which 'F' Gas Category qualification is required to recover refrigerant from an air conditioning system which has a charge of 7.5 kg of R407C?

- a) I
- b) II
- c) III
- d) IV

Reference 03.01

Which of the following saturation temperatures satisfies the BS EN 378 requirement for pressure testing the high side of cooling systems fitted with air cooled condensers?

- a) 32°C
- b) 43°C
- c) 55°C
- d) 63°C

Reference 04.01

Which of the following is **most** likely to increase refrigerant leakage potential from an air to water heat pump system? Excessive

- a) expansion valve superheat
- b) liquid line subcooling
- c) discharge vapour superheat
- d) expansion line subcooling.

Reference 05.01**02.01 for unit -301 candidates**

Which one of the following is the correct method for transporting recovered waste compressor oil back to licensed waste manager?

- a) Record oil type and weight and secure it in vehicle.
- b) Record oil quantity and wedge it in vehicle with tool box.
- c) Record oil quantity, sign it over to your company and secure it in vehicle.
- d) Record oil colour, sign it over to your company and wedge it in vehicle.

Reference 06.01

The function of the compressor is to

- a) circulate refrigerant vapour and increase pressure
- b) control refrigerant flow and decrease pressure
- c) reject latent heat to cause a change of state
- d) absorb latent heat to cause a change of state.

Reference 06.02

Which one of the following conditions is most likely to indicate imminent compressor motor failure on a blast freezer system? The compressor body is

- a) frosted
- b) cool to touch
- c) warm
- d) too hot to touch.

Reference 07.01

Which one of the following condenser types would run with the lowest condensing temperature?

- a) Natural convection air cooled.
- b) Forced convection air cooled.
- c) Water cooled.
- d) Evaporative.

Reference 07.02

A clean condenser on an air conditioning system leads to

- a) higher discharge pressure and higher efficiency
- b) lower discharge pressure and lower efficiency
- c) higher discharge pressure and lower efficiency
- d) lower discharge pressure and higher efficiency.

Reference 08.01

For every one degree Celsius that the evaporating temperature is increased, cooling capacity

- a) increases by 3% and energy use increases by 3%

- b) increases by 3% and energy use decreases by 3%
- c) decreases by 3% and energy use increases by 3%
- d) decreases by 3% and energy use decreases by 3%.

Reference 08.02

Which one of the following is **most** likely to cause the evaporator of an unprotected water chiller to freeze solid?

- a) Refrigerant undercharge.
- b) Refrigerant overcharge.
- c) Higher than normal waterside temperature.
- d) Lower than normal waterside temperature.

Reference 09.01

The function of an expansion valve is to

- a) circulate refrigerant vapour and increase pressure
- b) control refrigerant flow and decrease pressure
- c) reject latent heat to cause a change of state
- d) absorb latent heat to cause a change of state.

Reference 09.02

Which one of the following Thermostatic Expansion Valve superheat settings is likely to cause a system hermetic compressor to run continuously and overheat?

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

Reference 10.01

03.01 for unit -301 candidates and 05.01 for unit -401 candidates

Which one of the following refrigerants is classified as an Ozone Depleting Substance?

- a) R22
- b) R134a
- c) R600a
- d) R744

Reference 10.02

03.02 for unit -301 candidates and 05.02 for unit -401 candidates

Which one of the following international agreements is responsible for the phase out of HCFCs?

- a) Kyoto Protocol.
- b) Lisbon Protocol.
- c) Montreal Protocol.
- d) Geneva Protocol.

Reference 11.01

04.01 for unit -301 candidates and 06.01 for unit -401 candidates

Which one of the following refrigerant hazards can make an affected person feel 'high'?

- a) Asphyxiation.
- b) Thermal decomposition.
- c) Central nervous system effect.
- d) Cardiac sensitization.

Reference 11.02

Residual flux on the outside of a brazed copper pipe must be removed because

- a) it absorbs water from the air and corrodes the pipe
- b) it gives off harmful gases
- c) it causes the insulation to be conductive to heat
- d) excessive flux appears profligate and wasteful.

Reference 11.03

Which one of the following pipe diameters is **most** likely to fail when strength tested with Oxygen Free Nitrogen?

- a) ½ inch
- b) 1 1/8 inch
- c) 2 ¼ inch
- d) 4 1/8 inch

4 Sample questions – answer keys

Question	Answer key
01.01	C
01.02	B
01.03	D
01.04	A
01.05	A
01.06	D
01.07	C
02.01 (01.01 for 301)	C
02.02 (01.02 for 301)	C
02.03 (01.03 for 301)	D and A (2 questions)
02.04 (01.04 for 301)	A
03.01	C
04.01	C
05.01 (02.01 for 301)	C
06.01	A
06.02	D
07.01	D
07.02	D
08.01	B
08.02	D
09.01	B
09.02	D
10.01 (03.01 for 301) (05.01 for 401)	A
10.02 (03.02 for 301) (05.02 for 401)	C
11.01 (04.01 for 301) 06.01 for 401)	C
11.02	A
11.03	D

5 Test specifications

2079-101

Knowledge assessment of F-Gas and ODS Regulations

Category I – leak checking, recovery, installation, service, and maintenance of equipment

40 questions

80 minutes

Closed book

Outcome	Area		No. of questions	% of overall grade
01 Basic thermodynamics and indirect leakage checking principles	01.01	Identify standard units of temperature, pressure, mass, density, and enthalpy	13	32.5
	01.02	Describe basic theory of basic vapour compressions cycle, including key terms, and use of basic P-h diagram.		
	01.03	Describe the function of the four major components/processes (compressor, condenser, expansion device, evaporator)		
	01.04	Identify condition/state of refrigerant (i.e. superheated vapour/2 phase mix/subcooled liquid) by use of refrigerant comparator or service gauge.		
	01.05	Determine reasonable operating conditions (sat. temperatures) for a condenser and evaporator, for a range of applications.		
	01.06	Describe features of zeotropic blends		
	01.07	Understand the function of and role/importance of monitoring system performance for indications that leakage has occurred from: <ul style="list-style-type: none"> a) valves – service, pressure relief b) thermostats/pressure controls c) liquid line, receiver sight glasses and indicators d) defrost controls e) overloads f) service gauge manifold and thermometer g) oil control and separator systems h) high pressure receivers i) low pressure accumulators. 		
02 Environmental impact of refrigerants and corresponding environmental regulations	02.01	Describe climate change and the Kyoto Protocol.	6	15
	02.02	Understand direct and indirect Global Warming Potential (GWP) of the common HFC and HC refrigerants.		
	02.03	Understand importance of energy efficiency on greenhouse gas emissions to the atmosphere.		
	02.04	Describe the basic requirements of Regulation (EC) No. 842/2006 and other relevant regulations.		
03 Records &	03.01	Describe the equipment records/commissioning data requirements to be recorded in such records.	2	5

commissioning data requirements				
04 Checks for leakages	04.01	Identify potential leakage points of refrigeration/air conditioning and heat pump equipment.	2	5
05 Handling, storage, transportation and disposal	05.01	State requirements and procedures for handling, storage, transportation and disposal of contaminated refrigerant and oil.	2	5
06 Compressor function and leakage risks	06.01	Describe the function of a compressor and the risks of refrigerant leakage or release associated with it.	2	5
	06.02	Identify the state/condition of a compressor that could lead to refrigerant release.		
07 Condenser function and leakage risks	07.01	Describe the function of a condenser and the risks of refrigerant leakage or release associated with it.	2	5
	07.02	Identify the state/condition of a condenser that could lead to refrigerant release.		
08 Evaporator function and leakage risks	08.01	Describe the function of an evaporator and the risks of refrigerant leakage or release associated with it.	2	5
	08.02	Identify the state/condition of an evaporator that could lead to refrigerant release.		
09 Thermostatic expansion valve and capillary tube restrictor function and leakage risk	09.01	Describe the function of a thermostatic expansion valve and a capillary tube restrictor, and the risk of refrigerant release associated with them.	2	5
	09.02	Identify the state/condition of a thermostatic expansion valve and capillary tube restrictor that could lead to refrigerant release.		
10 HCFC refrigerants and the Montreal Protocol	10.01	Demonstrate knowledge of the potential of HCFC refrigerants to deplete ozone, and the effect of chlorine on ozone depletion. Identify the ODP of various HCFC refrigerants in use.	2	5
	10.02	Describe the basic requirements of Regulation (EC) 2037/2000 the impact of the Kyoto Protocol.		
11 Hazards	11.01	Describe the hazards associated with refrigerant release, including <ul style="list-style-type: none"> • cold burns • asphyxiation • thermal decomposition • CNS effect • Cardiac sensitisation. 	5	12.5
	11.02	Describe the hazards associated with Flame brazing.		
	11.03	Describe the hazards associated with pressure testing with nitrogen.		

2079-201

Knowledge assessment of F-Gas and ODS Regulations

Category II –installation, service and maintenance of equipment with a charge of less than 3 kg (6 kg if hermetically sealed) and leakage checking

34 questions

70 minutes

Closed book

Outcome	Area		No. of questions	% of overall grade
01 Basic thermodynamics and indirect leakage checking principles	01.01	Identify standard units of temperature, pressure, mass, density, and enthalpy	11	32
	01.02	Describe basic theory of basic vapour compressions cycle, including key terms, and use of basic P-h diagram.		
	01.03	Describe the function of the four major components/processes (compressor, condenser, expansion device, evaporator)		
	01.04	Identify condition/state of refrigerant (i.e. superheated vapour/2 phase mix/subcooled liquid) by use of refrigerant comparator or service gauge.		
	01.04	Determine reasonable operating conditions (sat. temperatures) for a condenser and evaporator, for a range of applications.		
	01.06	Describe features of zeotropic blends		
02 Environmental impact of refrigerants and corresponding environmental regulations	02.01	Describe climate change and the Kyoto Protocol.	6	18
	02.02	Understand direct and indirect Global Warming Potential (GWP) of the common HFC and HC refrigerants.		
	02.03	Understand importance of energy efficiency on greenhouse gas emissions to the atmosphere.		
	02.04	Describe the basic requirements of Regulation (EC) No. 842/2006 and other relevant regulations.		
03 Records & commissioning data requirements	03.01	Describe the equipment records/commissioning data requirements to be recorded in such records.	2	6
04 Checks for leakages	04.01	Identify potential leakage points of refrigeration/air conditioning and heat pump equipment.	2	6
05 Handling, storage, transportation and disposal	05.01	State requirements and procedures for handling, storage, transportation and disposal of contaminated refrigerant and oil.	2	6
06 Compressor function and leakage risks	06.01	Describe the function of a compressor and the risks of refrigerant leakage or release associated with it.	1	3

07 Condenser function and leakage risks	07.01	Describe the function of a condenser and the risks of refrigerant leakage or release associated with it.	1	3
08 Evaporator function and leakage risks	08.01	Describe the function of an evaporator and the risks of refrigerant leakage or release associated with it.	1	3
09 Thermostatic expansion valve and capillary tube restrictor function and leakage risk	09.01	Describe the function of a thermostatic expansion valve and a capillary tube restrictor, and the risk of refrigerant release associated with them.	1	3
10 HCFC refrigerants and the Montreal Protocol	10.01	Demonstrate knowledge of the potential of HCFC refrigerants to deplete ozone, and the effect of chlorine on ozone depletion. Identify the ODP of various HCFC refrigerants in use.	2	6
	10.02	Describe the basic requirements of Regulation (EC) 2037/2000 the impact of the Kyoto Protocol.		
11 Hazards	11.01	Describe the hazards associated with refrigerant release, including <ul style="list-style-type: none"> • cold burns • asphyxiation • thermal decomposition • CNS effect • Cardiac sensitisation. 	5	14
	11.02	Describe the hazards associated with Flame brazing.		
	11.03	Describe the hazards associated with pressure testing with nitrogen.		

2079-301**Knowledge assessment of F-Gas and ODS Regulations****Category III – recovery of refrigerant**

12 questions

25 minutes

Closed book

Outcome	Area		No. of questions	% of overall grade
01 Environmental impact of refrigerants and corresponding environmental regulations	01.01	Describe climate change and the Kyoto Protocol.	6	50
	01.02	Understand direct and indirect Global Warming Potential (GWP) of the common HFC and HC refrigerants.		
	01.03	Understand importance of energy efficiency on greenhouse gas emissions to the atmosphere.		
	01.04	Describe the basic requirements of Regulation (EC) No. 842/2006 and other relevant regulations.		
02 Handling, storage, transportation and disposal	02.01	State requirements and procedures for handling, storage, transportation and disposal of contaminated refrigerant and oil.	2	16.6
03 HCFC refrigerants and the Montreal Protocol	03.01	Demonstrate knowledge of the potential of HCFC refrigerants to deplete ozone, and the effect of chlorine on ozone depletion. Identify the ODP of various HCFC refrigerants in use.	2	16.6
	03.02	Describe the basic requirements of Regulation (EC) 2037/2000 the impact of the Kyoto Protocol.		
04 Hazards	04.01	Describe the hazards associated with refrigerant release, including <ul style="list-style-type: none">• cold burns• asphyxiation• thermal decomposition• CNS effect• Cardiac sensitisation.	2	16.6

2079-401**Knowledge assessment of F-Gas and ODS Regulations****Category IV – leakage checking**

16 questions

35 minutes

Closed book

Outcome	Area		No. of questions	% of overall grade
01 Basic thermodynamics and indirect leakage checking principles	01.01	Identify standard units of temperature, pressure, mass, density, and enthalpy	2	12.5
02 Environmental impact of refrigerants and corresponding environmental regulations	02.01	Describe climate change and the Kyoto Protocol.	6	37.5
	02.02	Understand direct and indirect Global Warming Potential (GWP) of the common HFC and HC refrigerants.		
	02.03	Understand importance of energy efficiency on greenhouse gas emissions to the atmosphere.		
	02.04	Describe the basic requirements of Regulation (EC) No. 842/2006 and other relevant regulations.		
03 Records & commissioning data requirements	03.01	Describe the equipment records/commissioning data requirements to be recorded in such records.	2	12.5
04 Checks for leakages	04.01	Identify potential leakage points of refrigeration/air conditioning and heat pump equipment.	2	12.5
05 HCFC refrigerants and the Montreal Protocol	05.01	Demonstrate knowledge of the potential of HCFC refrigerants to deplete ozone, and the effect of chlorine on ozone depletion. Identify the ODP of various HCFC refrigerants in use.	2	12.5
	05.02	Describe the basic requirements of Regulation (EC) 2037/2000 the impact of the Kyoto Protocol.		
06 Hazards	06.01	Describe the hazards associated with refrigerant release, including <ul style="list-style-type: none">• cold burns• asphyxiation• thermal decomposition• CNS effect• Cardiac sensitisation.	2	12.5

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