



**The Chartered
Institute of Logistics
and Transport**

**Sample
DGSA Examination Papers
March 2019 onwards**

Paper 2 Solutions

NOTE TO CANDIDATES

1. Answers to questions must be given in the space provided below each question.
2. In your answers use of the following are permitted:

ADR ADR Agreement 2019

CDGRR European Communities (Carriage of Dangerous Goods by Road and Use of Transportable Pressure Equipment) Regulations 2011 to 2019 (see link below):

https://www.hsa.ie/eng/Your_Industry/ADR_Carriage_of_Dangerous_Goods_by_Road/ADR_General_Information/Legislation/.

An administrative consolidation of the regulations up to 2017 is available (see link below):

[https://www.hsa.ie/eng/Your_Industry/ADR - Carriage of Dangerous Goods by Road/ADR General Information /Legislation/SI No 349 of 2011 CONSOLIDATED.pdf](https://www.hsa.ie/eng/Your_Industry/ADR_-_Carriage_of_Dangerous_Goods_by_Road/ADR_General_Information/Legislation/SI_No_349_of_2011_CONSOLIDATED.pdf).

Note: the consolidated version was prepared by the Health and Safety Authority for ease of reference only and is not a legal document.

3. All answers **must** be in ink.
4. If you need extra space, write 'continued' and finish your answer in the space provided at the end of this booklet. Make sure you mark any continuation with the question number.
5. Rough work, not intended to be read by the marker, should be scored out.
6. No part of this booklet is to be torn out. No writing is allowed on any other paper.
7. No unauthorised material may be brought into the examination room.
8. No talking or other means of communication between candidates is allowed during the examination. Any candidate found to be doing so will be subject to instant dismissal from the examination room. All queries should be directed to an invigilator.
9. All queries should be directed to an invigilator.

10. You may not leave the examination room during the first 30 minutes or last 15 minutes of the examination unless you are ill. In this case, let an invigilator know and s/he will make sure the correct procedure is followed.
11. You must hand your booklet to an invigilator before leaving.
12. Booklets must not be removed from the examination room under any circumstances.

Note: When you use a reference document to find your answer, you must include the following information – the document title and, as appropriate, the relevant paragraph numbers, sub-paragraph numbers, section, regulation, and schedule.

Marks may be lost if relevant detail is omitted.

**Dangerous Goods Safety Adviser
Examination Paper 2**

70 Marks

Pass Mark 65% (47 Marks)

**YOU MUST ANSWER CASE STUDY ONE IN SECTION A
COMPULSORY CASE STUDY**

**YOU MUST ANSWER ONE OR OTHER OF THE TWO CASE
STUDIES IN SECTION B**

Attempt ONE Case Study from Section A and one Case Study from Section B

Section A

Compulsory Case Study 1

1. Mendit Fast Ltd.'s business is concerned with supplying the motor vehicle trade with all its needs. It is involved in supplying a variety of substances, mixtures and articles for this industry's needs.
 - a. Supplying wet batteries, non-spillable, form a significant part of the company's trade. State the Class, UN number and classification code assigned to these articles.

Solution

Class 8. (1 Mark) UN 2800. (1 Mark) classification code C11. (1 Mark)

(4 Marks)

Reference(s):	<i>2019 ADR: The Dangerous Goods List, Table A, columns (1), (2), (3a) and (3b); and Table B, Chapter 3.2 (1 Mark)</i>
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- b. Some of the articles it supplies are replacement air bag modules for some of the car manufacturers. The sales manager notes that these could be explosive articles, UN 0503 of Class 1, or miscellaneous dangerous goods, UN 3268 of Class 9. The manager asks you as the company's DGSA to help them understand the difference between the two classifications. What would you advise?

Solution

UN 3268 has Special provision 280. (1 Mark)

Special provision 280 permits the air bag modules to be assigned to UN 3268; if they have been tested, in accordance with Test series 6(c) of Part 1 of the Manual of Tests and Criteria, and there is no explosion of the device, no fragmentation of the device casing or pressure receptacle, and no projection hazard nor thermal effect which would significantly hinder fire-fighting or emergency response efforts in the immediate vicinity. (3 Marks)

(4 Marks)

Reference(s):	<i>2019 ADR: The Dangerous Goods List, Table A, column (6), and Table B, Chapter 3.2. Special provision 280 in paragraph 3.3.1, Chapter 3.3 (1 Mark)</i>
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- c. The following consignment is to be dispatched on one of the company's 5 tonne maximum permissible gross mass delivery vans:

- 5 x 25 litre drums of flammable paint of Class 3, UN 1263, packing group III
- 4 x 25 litre jerricans of a degreasant called trichloroethylene, UN 1710

Would the driver need to have a valid ADR driver training certificate? Explain your answer as fully as possible.

Solution

'5 L' appears in the Dangerous Goods List, Table A, column (7a) for both UN 1263, packing group III, and UN 1710, indicating that 5 litres is the maximum quantity per inner packaging for the Limited Quantities to apply. Hence this exemption does not apply and cannot be used to exempt the driver from the need for a valid ADR driver training certificate. (2 Marks).

Now turn to paragraph 1.1.3.6 to see if the exemptions with respect to the size of the load apply to this consignment. Establish that UN 1263, packing group III, is a Transport Category 3 substance (1 Mark) while UN 1710 is a Transport category 2 substance. (1 Mark).

Using the formula in subparagraph 1.1.3.6, the 100 litres of UN 1710 is multiplied by 3 to give a number of '300' (1 Mark) while the 125 litres of UN

1263, packing group III, is multiplied by 1 to give a number of '125'. (1 Mark).
These two numbers are added together to give a total number of '425'. (1 Mark).

As this total number is less than the threshold of '1000', the provisions of paragraph 1.1.3.6 apply and therefore the driver does not need to have a driver training certificate. (2 Marks)

(10 Marks)

Reference(s):	2019 ADR: The Dangerous Goods List, Table A, columns (7a) and (15), Chapter 3.2; and subparagraphs 1.1.3.6.1, 1.1.3.6.2, 1.1.3.6.3 and 1.1.3.6.4, Chapter 1.1.3. (1 Mark)
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d. Many of the packaged goods loads that are carried on the company's vehicles require the vehicles to be marked with reflectorized orange-coloured plates, because of the amounts of dangerous goods they are carrying.

i. What are the minimum dimensions of these plates (ignoring any exemptions)?

Solution

40 cm base x 30 cm high with a 15 mm wide black border. . (2 Marks: 1 Mark for 40 cm x 30 cm and 1 Mark for 15 mm border)

i. Where should they be displayed?

Solution

One at the front and one at the rear of the vehicle. (1 Mark).

ii. What should happen to the plates once the packaged dangerous goods have been unloaded?

Solution

They should be removed or covered up (1 Mark).

iii. State a requirement with respect to fire resistance that any covers for these plates should have.

Solution

They should be capable of resisting fire engulfment for up to 15 minutes. (1 Mark).

(6 Marks)

Reference(s):	2019 ADR: Paragraphs 5.3.2.1.1, 5.3.2.1.8 and 5.3.2.2.1, Chapter 5.3 (1 Mark).
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- e.
- ii. What is the minimum total capacity of fire extinguishers with which the 5 tonne vehicles should be equipped?

Solution

8 kg. (1 Mark).

- iii. What is the minimum capacity of the fire extinguisher for fighting a fire in the engine or cab of the vehicle?

Solution

2 kg (1 Mark).

- iv. What is the minimum capacity of at least one other fire extinguisher with which these vehicles should be equipped?

Solution

6 kg (1 Mark).

- v. In what circumstances could the number of fire extinguisher be reduced to just 1 x 2 kg extinguisher?

Solution

When all the dangerous goods in the load are in accordance with the provisions of paragraph 1.1.3.6. Also when all the dangerous goods in the load are subject to Special provision S3 of Chapter 8.5 (i.e. transport units carrying only infectious substances of Class 6.2). (2 Marks).

- vi. What details should be inscribed on the fire extinguishers?

Solution

A mark of compliance with a standard recognised by the Competent Authority and a date (month, year) of the next recurrent inspection or of the maximum permissible period of use, as applicable. (1 mark when both details are stated)

- vii. With what standard should the fire extinguishers comply? You may be brief in your answer.

Solution

EN 3 Portable fire extinguishers. (1 Mark).

(8 Marks)

Reference(s):	<i>2019 ADR: The Dangerous Goods List, Table A, column (19), Chapter 3.2; subparagraphs 8.1.4.1, 8.1.4.2, 8.1.4.3 and 8.1.4.4, Chapter 8.1; and Chapter 8.5 (1 Mark).</i>
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- f.
- i. One of the drivers of the larger vehicles carrying dangerous goods asks their manager for a helper to accompany them to unload. Is this permissible?

Solution

Yes, provided the helper has received training in the carriage of dangerous goods appropriate to the responsibilities and duties in accordance with Chapter 1.3 (1 Mark).

- ii. A friend of the helper who works at the company next door to Mendit Fast Ltd. on the night shift asks the driver as he/she sets out on morning deliveries for a lift home, as they will be passing nearby. Is this permissible?

Solution

No, because the friend would be deemed to be a passenger; and passengers are not allowed. (1 Mark).

(3 Marks)

Reference(s):	<i>2019 ADR: Paragraphs 1.3.1 and 1.3.2, Chapter 1.3; paragraph 8.2.3, Chapter 8.2; and paragraph 8.3.1, Chapter 8.3 (1 Mark).</i>
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[Go to Section B]

YOU MUST ANSWER ONE OR OTHER OF THE TWO CASE STUDIES IN SECTION B

Section B

Case Study 2

1. Tank-vehicles are to carry ammonium nitrate liquid (hot solution of 85% concentration) from Vienna in the German speaking country of Austria to Barcelona, Spain; passing through some road tunnels with restrictions. It is a contractual requirement that a sample of the substance is sent in advance to the consignee for evaluation before delivery. The consignor also wishes to explore the possibility of delivery of the substance in a dry, powdery form, as ammonium nitrate-based fertilizer in bulk to see if this is a cheaper option.

- a. What is the Class and UN number of the liquid substance?

Solution

Class 5.1, UN2426 (2 Marks).

(3 Marks)

Reference(s):	<i>2019 ADR: The Dangerous Goods List, Table A, columns (1) and (2), and Table B, Chapter 3.2 (1 Mark).</i>
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- b. Is the transport of the ammonium nitrate liquid in tank-vehicles permitted?
Explain how you reached your conclusion.

Solution

Yes. (1 Mark). Because the tank code LABV⁽⁺⁾ is given in column (12) of The Dangerous Goods List, Table A. (1 Mark).

(3 Marks)

Reference(s):	<i>2019 ADR: The Dangerous Goods List, Table A, column (12), Chapter 3.2. (1 Mark).</i>
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- c.

- i. Show the dangerous goods information that should be shown in the transport document on the outward laden journey to Barcelona.

Solution

UN 2426 Ammonium Nitrate Liquid, 5.1, (E). (2 Marks): 1 Mark for the details to 'Liquid' and 1 Mark. for the remainder)

- ii. In what language(s) should the transport document be prepared? Be as explicit in your answer as you can.

Solution

In the language of the country of origin and, if that is not English, French or German, also in English, French or German. Therefore, as German is the official language in Austria, it is sufficient for the document to be written just in German. (2 Marks)

- iii. What should be done to the original transport document for the laden tank outbound to Vienna to allow it to be used for the return journey of the empty uncleaned tank-vehicle.

Solution

The transport document for the outward journey may be used. The indication of the quantity to be eliminated and replaced by the words – 'EMPTY, UNCLEANED RETURN'. (2 Marks)

(7 Marks)

Reference(s):	<i>2019 ADR: The Dangerous Goods List, Table A, columns (1), (2), (3a) and (4), Chapter 3.2. Subparagraphs 5.4.1.1.1 and 5.4.1.1.6.2.3, Chapter 5.4 (1 Mark).</i>
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- d.
i. What marking plates should be affixed and where to the tank-vehicles? Give full details of what is required for the tank-vehicles.

Solution

Either:

Two plain reflectorized orange-coloured plates, one at the front and one at the rear of the vehicle and two reflectorized orange-coloured plates, bearing the inscription 59 on the top part and 2426 on the lower part, on each side of the tank.

Or:

Two reflectorized orange-coloured plates, bearing the inscription 59 on the top part and 2426 on the lower part, one at the front and one at the rear of the vehicle

(3 Marks for either solution, with 1 of the marks for the correct detail 59/2426)

- ii. What placards are required to be affixed to the tank-vehicles and where?

Solution

*An oxidizing No. 5.1 placard on each side and the rear of the vehicle.
(2 Marks: 1 Mark for identifying the placard and 1 Mark for stating the correct position.)*

(6 Marks)

Reference(s):	<i>2019 ADR: The Dangerous Goods List, Table A, columns (1), (5) and (20), Chapter 3.2; and subparagraphs 5.3.1.4.1, 5.3.2.1.1 and 5.3.2.1.2 or 5.3.2.1.6, Chapter 5.3. (1 Mark).</i>
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e.

- i. What is the minimum total capacity of fire extinguishers with which the tank-vehicles should be equipped? Each tank-vehicle has a maximum permissible mass of 24 tonnes.

Solution

12 kg dry powder. (1 Mark).

- ii. What is the minimum capacity of the fire extinguisher for fighting a fire in the engine or cab of the vehicle?

Solution

2 kg dry powder. (1 Mark).

- iii. What is the minimum capacity of at least one other fire extinguisher with which the tank-vehicles should be equipped?

Solution

6 kg dry powder. (1 Mark).

- iv. What details should be inscribed on the fire extinguishers? v. With what standard should the fire extinguishers comply? You may be brief in your answer.

Solution

A mark of compliance with a standard recognised by the Competent Authority and the date (month, year) of the next recurrent inspection, or of the maximum permissible period of use, as applicable. (1 Mark only when both details are stated.)

- v. With what standard should the fire extinguishers comply? You may be brief in your answer.

Solution

EN 3, portable fire extinguishers (1 Mark).

(6 Marks)

Reference(s):	<i>2019 ADR: Paragraphs 8.1.4.1, 8.1.4.3 and 8.1.4.4, Chapter 8.1 (1 Mark).</i>
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- f. Can the samples of ammonium nitrate liquid be sent forward in advance of the tanker deliveries as Limited Quantities packages? Explain your answer as fully as you can.

Solution

No. (1 Mark).

'0' appears in column (7a) of the Dangerous Goods List, Table A, meaning that there is no Limited Quantities allowance for it. (1 Mark).

(3 Marks)

Reference(s):	<i>2019 ADR: The Dangerous Goods List, Table A, column (7a), Chapter 3.2; and subparagraph 3.4.1, Chapter 3.4 (1 Mark).</i>
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g.

- i. Is transport of UN 2067 Ammonium Nitrate Based Fertilizer in bulk allowed?

Solution

Yes. (1 Mark).

Because the codes BK1, BK2 and BK3 are in column (10) and VC1 and VC2 are in column (17) of the Dangerous Goods List, Table A, for this substance. (2 Marks: 1 Mark for identifying the codes in column (10) and 1 Mark for identifying the codes in column (17))

- ii. Explain the meaning of special provision for carriage in bulk AP6 applicable to dangerous goods of UN 2067.

Solution

If the vehicle is made of wood or other combustible material, an impermeable surfacing resistant to combustion or a coating of sodium silicate or similar substance shall be provided. Sheeting shall also be impermeable and non-combustible. (1 Mark).

Carriage in bulk shall only be as a full load. (1 Mark).

(7 Marks)

Reference(s):	<i>2019 ADR: The Dangerous Goods List, Table A, columns (10) and (17), Chapter 3.2. (1 mark) Meaning of additional provisions AP6 and AP7 in subparagraph 7.3.3.2.4, Chapter 7.3 (1 Mark).</i>
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Case Study 3

1. Lynch Haulage (1972) Ltd. is an international trailer operator based in County Meath. A driver returning to Ireland is asked to collect a mixed consignment of packaged dangerous goods. The dangerous goods are to be collected in Milan, Italy, and Zurich, Switzerland, to consignees in Mullingar and Dundalk. For the purposes of this case study, ignore any implications of a journey by sea.
 - a. The consignment from Zurich consists of 100 x 50 kg gross palletised fibreboard drums of solid UN 1620.
 - i. Identify this substance.

Solution

Lead cyanide (1 Mark).

- ii. The drums are UN certified and have the detail '1G' in the code. Is this packaging with this code authorised for filling with this substance? Explain your answer.

Solution

The '1G' in the UN Packaging Code indicates a fibreboard drum. Packing instruction P002 applies to this substance. The use of fibreboard drums, with '1G' in the UN Packaging Code, is authorised in P002 (2 Marks)

- iii. What danger marks and labels should be shown on the drums? Be as specific as you can in your answer

Solution

The drums should be marked with the UN number, i.e. UN 1620. (1 Mark). They should be labelled with a No. 6.1 toxic label (1 Mark).

(7 Marks)

Reference(s):	<i>2019 ADR: The Dangerous Goods List, Table A, columns (1), (2), (5) and (8), Chapter 3.2; packing instruction P002 in subparagraph 4.1.4.1, Chapter 4.1; (1 Mark) subparagraphs 5.2.1.1 and 5.2.2.1.1, Chapter 5.2. (1 Mark).</i>
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b. The consignment from Milan consists of 20 palletised 10 litre drums of UN 1994. Each drum has a maximum gross mass of 15 kg.

i. Identify this substance.

Solution

Iron pentacarbonyl. (1 Mark)

ii. What danger marks and labels should appear on the drums? State your answer as fully as you can.

Solution

*They should be marked with the UN number, i.e. UN 1994. (1 Mark)
They should be labelled with a No. 6.1 toxic and a No. 3 flammable liquid labels (1 Mark)*

(4 Marks)

Reference(s):	<i>2019 ADR: The Dangerous Goods List, Table A, columns (1) and (5), Chapter 3.2; subparagraphs 5.2.1.1 and 5.2.2.1.1, Chapter 5.2 . (1 Mark)</i>
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c.

i. Show the dangerous goods information that should be shown in the transport document for the UN 1994 drums.

Solution

UN 1994 Iron Pentacarbonyl, 6.1(3), I, (C/D). (2 Marks: 1 Mark to 'Pentacarbonyl' and 1 Mark for the remainder.)

ii. In what language(s) should the transport document be prepared? Be as specific as you can in your answer and draw a conclusion.

Solution

In the language of country of origin and (if that is not English, French or German) also in English, French or German. Therefore, in Italian and English or French or German. (2 Marks)

(5 Marks)

Reference(s):	<i>2019 ADR: The Dangerous Goods List, Table A, columns (1), (2), (3a), (4) and (5), Chapter 3.2; subparagraphs 5.4.1.1.1 and 5.4.1.4.1, Chapter 5.4 (1 Mark)</i>
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- d.
- i. During the journey, back from Milan to Ireland having collected both consignments, the driver finds him/herself unable to find a depot, factory or supervised lorry park to leave his/her vehicle overnight. What further choices are open to the driver? Justify your answer fully with reference to the quantities of both of the substances forming the load and any relevant thresholds. The driver has already made both collections when this problem arises.

Solution

The UN 1994 drums weigh a total of 300 kg. Special operating provision S14 applies to the carriage of the UN 1994 substance. Special operating provision S14 stipulates that the provisions of Chapter 8.4, concerning the supervision of vehicles, applies to a vehicle carrying any amount of this substance. (1 Mark)

The UN 1620 drums weigh a total of 5000 kg. Special operating provision S19 applies when more than 5,000 kg of UN 1620 substance is carried in the load; and hence the provisions of Chapter 8.4 do not apply to the carriage of this substance. However, because of the presence of UN 1994 substance in the load, the provisions of Chapter 8.4 applies to the overnight parking of the vehicle. (1 Mark)

The only options left to the driver are to find, in order of preference,

(a) A public or private vehicle park, where the vehicle is not likely to suffer damage from other vehicles; (1 Mark)

or

(b) A suitable open space separated from the public highway and from dwellings, where the public does not normally pass or assemble (1 Mark)

- ii. Are there any circumstances when the Competent Authority has to be involved in any of the decisions taken by the driver concerning places where to stop?

Solution

As special operating provision S9 applies (it in fact applies to both substances), the permission of the Competent Authority is needed if the stopping place is near any inhabited or frequented places (1 Mark)

(6 Marks)

Reference(s):	<i>2019 ADR: The Dangerous Goods List, Table A, column (19), Chapter 3.2; Chapter 8.4; and meaning of S9, S14 and S19 in Chapter 8.5. (1 Mark)</i>
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- e. The driver employed by Lynch Haulage (1972) Ltd. is a Romanian. His/her command of the English language is not good enough to understand the instructions in writing provided by the employer in English. What action should the employer take?

Solution

The instructions in writing must be provided to the driver in a language that he or she can read and understand, i.e. in Romanian in this case (1 Mark)

(2 Marks)

Reference(s):	<i>2019 ADR: Subparagraph 5.4.3.2, Chapter 5.4 (1 Mark)</i>
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f.

- i. What marking plates should appear on the vehicle and where should they be placed?

Solution

Two reflectorized orange-coloured plates, one at the front and one at the rear of the vehicle. (1 Mark)

- ii. What are the minimum dimensions of the plates, noting that it is a large vehicle?

Solution

40 cm base x 30 cm high, with a 15 mm black border. (1 Mark)

(3 Marks)

Reference(s):	<i>2019 ADR: Subparagraphs 5.3.2.1.1 and 5.3.2.2.1 (or 5.3.2.2.3), Chapter 5.3. (1 Mark)</i>
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- g.
- i. State the three items of miscellaneous equipment that must be carried on the vehicle for all danger label numbers (noting the label numbers of the two substances forming the load).

Solution

At least one-wheel chock

Two self-standing warning signs

Eye rinsing liquid (1 Mark)

- ii. State any two items of equipment for the personal protection of the vehicle crew that must be carried on board the vehicle.

Solution

Any two from:

A warning vest

Portable lighting apparatus

A pair of protective gloves

Eye protection. (1 Mark)

- iii. Why is it necessary for each member of the vehicle crew to be equipped with an emergency escape mask?

Solution

Because both substances require the No. 6.1 toxic label (1 Mark)

- iv. For which of the two substances is it necessary for a collecting container and why?

Solution

UN 1994, as it requires a No. 3 flammable liquid label. (1 Mark)

(5 Marks)

Reference(s):	<i>2019 ADR: Subparagraphs 5.4.3.4, Chapter 5.4; or subparagraphs 8.1.5.2 and 8.1.5.3, Chapter 8.1. (1 Mark)</i>
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- h. After unloading the UN 1620, some of the substance is noticed on the floor of the trailer. The driver still has to make a second delivery of UN 1994 to Dundalk. What should be done next?

Solution

Loading, unloading and handling special provision CV13 applies to both substances. CV13 stipulates that, if any substance to which CV13 has been assigned has leaked and been spilled in the vehicle, the vehicle may not be reused until it has been thoroughly cleaned and, if necessary, disinfected or decontaminated; and the other goods carried in the vehicle examined for possible contamination (2 Marks)

(3 Marks)

Reference(s):	<i>2019 ADR: The Dangerous Goods List, Table A, column (18), Chapter 3.2; and loading, unloading and handling special provision CV13 in subparagraph 7.5.11, Chapter 7.5. (1 Mark)</i> <i>[Note: Answers based on subparagraph 7.5.8.1 are not acceptable]</i>
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[END OF QUESTION PAPER]