New York State
Department of Civil Service

Committed to Innovation, Quality, and Excellence

A Guide to the Written Test

for the

Firefighter Series

Opportunities at work.

Andrew M. Cuomo
Governor

INTRODUCTION

The New York State Department of Civil Service has developed this test guide to familiarize you with the written test for the Firefighter Series, scheduled for March 3, 2012. This test guide provides a general description of the subject areas which will be tested and an explanation of the different types of questions that will be presented.

The written test for these examinations has an overall time allowance of 5 hours.

FOR ALL MUNIPALITIES *EXCEPT* WHITE PLAINS, MT. VERNON, AND NEW ROCHELLE:

The test questions will cover the following four subject areas (for a full description of each subject area, see the appropriate subject area section of this test guide):

1. Using logical reasoning to draw valid conclusions
2. Advising and interacting with others
3. Mechanical reasoning
4. Understanding and interpreting written material pertaining to fire

FOR WHITE PLAINS, MT. VERNON, and NEW ROCHELLE *ONLY*:

The test questions will cover the following five subject areas (for a full description of each subject area, see the appropriate subject area section of this test guide):

1. Mechanical reasoning
2. Understanding and interpreting written material pertaining to fire
3. Solving problems involving numbers
4. General science
5. Reasoning clearly and selecting a proper course of action in firefighting situations

These are the only subject areas that will be included on the written test. Specialized knowledge of firefighting is not required.

The remainder of this test guide explains how you will be tested in each of the subject areas listed above. A **TEST TASK** is provided for each subject area. This is an explanation of how a question will be presented and how to correctly answer it. Read each explanation carefully. This test guide also provides at least one **SAMPLE QUESTION** for each subject area. The sample question is similar to the type of questions that will be presented on the actual test. This test guide provides the **SOLUTION** and correct answer to each sample question. You should study each sample question and solution in order to understand how the correct answer was determined.

SUBJECT AREA

USING LOGICAL REASONING TO DRAW VALID CONCLUSIONS: These questions test for the ability to examine true statements and logically evaluate conclusions based on the information in the statements.

TEST TASK: Each question presents a paragraph made up of factual statements, followed by four listed conclusions – the choices. You must evaluate the factual information and the conclusions, and then select the one conclusion that is definitely true (valid) according to the factual statements. You should base your answer to each question only on the information provided, NOT on what you may happen to know about the subject discussed.

Some of the questions contain true statements that begin with or include the term "All," "Some," or "None" (See Sample Question 1). Other questions contain true statements that begin with or include the term "If," "Either," "Unless," or "Only if". (See Sample Question 2).

SAMPLE QUESTION 1:

Three firefighters from the city's largest fire station responded to a residential fire on Miller Street earlier today and extinguished the fire. All protective gear that the three firefighters wore at the Miller Street fire is ready to be cleaned. None of the injuries incurred by residents at the Miller Street fire were fatal.

Based on the information above, which one of the following conclusions MUST be true?

A. All protective gear that is ready to be cleaned is protective gear that the three firefighters wore at the Miller Street fire.
B. Some of the protective gear that the three firefighters wore at the Miller Street fire is not ready to be cleaned.
C. All of the injuries incurred by residents at the Miller Street fire were non-fatal.
D. Some fatal injuries were those incurred by residents at the Miller Street fire.

The correct answer to sample question 1 is C.

SOLUTION: *To answer this question correctly, you must be able to logically evaluate the statements in the paragraph and the four conclusions.*

Choice A *states, "All protective gear that is ready to be cleaned is protective gear that the three firefighters wore at the Miller Street fire." This is not definitely true. It is possible that the protective gear that is ready to be cleaned includes gear other than the gear worn by the three firefighters at the Miller Street fire. For example, other firefighters from this large fire station may have responded earlier today to a different fire, and their protective gear may also be ready to be cleaned. Although this Choice A conclusion may be true, it is not definitely true, and is therefore not the correct answer to this sample question. As a candidate, it is important for you to make this distinction between a conclusion that may be true and a conclusion that is definitely true.*

Choice B *states, "Some of the protective gear that firefighters wore at the Miller Street fire is not ready to be cleaned." This conclusion contradicts the paragraph statement, "All protective gear that the three firefighters wore at the Miller Street fire is ready to be cleaned." Choice B is not true, and is therefore not the correct answer to this sample question.*

Choice C *states, "All of the injuries incurred by residents at the Miller Street fire were non-fatal." This is a logical conclusion drawn from the paragraph statement, "None of the injuries incurred by residents at the Miller Street fire were fatal." If we know that none of the injuries from this fire were fatal, it is certain that all injuries from this fire were non-fatal. Choice C is definitely true, and is therefore the correct answer to this sample question.*

Choice D *states, "Some fatal injuries were those incurred by residents at the Miller Street fire." This conclusion contradicts the paragraph statement, "None of the injuries incurred by residents at the Miller Street fire were fatal." Choice D is not true, and is therefore not the correct answer to this sample question.*

- ***Therefore, the correct answer to sample question 1 is choice C.***

SUBJECT AREA

USING LOGICAL REASONING TO DRAW VALID CONCLUSIONS (cont.)

SAMPLE QUESTION 2:

At the scene of an arson fire, evidence is usually left behind. That evidence can usually be identified by a trained technician. For example, if a fire is started with a chemical accelerant, some trace of a chemical accelerant is left behind. This trace can be detected. Also, a trained technician can gather evidence by observing the burn pattern left behind at a fire scene. For example, if a fire is started by pouring diesel fuel on a vinyl floor, a distinctive pattern is left behind.

Based on the information above, which one of the following conclusions MUST be true?

A. If a chemical accelerant is not used to start a fire, some trace of a chemical accelerant is left behind.
B. Some trace of the chemical accelerant is left behind if a chemical accelerant is used to start a fire.
C. If a fire on a vinyl floor is not started with diesel fuel, a distinctive pattern is not left behind.
D. A distinctive pattern is not left behind if a fire on a vinyl floor is started with diesel fuel.

The correct answer to sample question 2 is B.

SOLUTION: *To answer this question correctly, you must be able to logically evaluate the statements in the paragraph and the four conclusions.*

Choice A *states, "If a chemical accelerant is not used to start a fire, some trace of a chemical accelerant is left behind." This choice is not reasonable. The paragraph states, "If a fire is started with a chemical accelerant, some trace of a chemical accelerant is left behind." This statement says nothing about what occurs when a chemical accelerant is <u>not</u> used to start a fire. There is no logical support for Choice A, so Choice A is not the correct answer to this sample question.*

Choice B *states, "Some trace of the chemical accelerant is left behind if a chemical accelerant is used to start a fire." This is an accurate restatement of the paragraph statement, "If a fire is started with a chemical accelerant, some trace of a chemical accelerant is left behind." Choice B is <u>definitely true</u>, and is therefore the correct answer to this sample question.*

Choice C *states, "If a fire on a vinyl floor is not started with diesel fuel, a distinctive pattern is not left behind." We know from the paragraph example that, "if a fire is started by pouring diesel fuel on a vinyl floor, a distinctive pattern is left behind." But this statement says nothing about the Choice C situation, a fire on a vinyl floor started in some other way. For Choice C to be true, every possible material other than diesel fuel, when used to start a vinyl floor fire, would leave no distinctive pattern behind. The paragraph does not tell us about the effect of every possible material used to start such a fire, so we cannot conclude that a distinctive pattern is never left behind. Therefore, Choice C is not the correct answer to this sample question.*

Choice D *states, "A distinctive pattern is not left behind if a fire on a vinyl floor is started with diesel fuel." This statement contradicts the paragraph statement, "if a fire is started by pouring diesel fuel on a vinyl floor, a distinctive pattern is left behind." Choice D is <u>not true</u>, and is therefore not the correct answer to this sample question.*

- ***Therefore, the correct answer to sample question 2 is choice B.***

SUBJECT AREA

ADVISING AND INTERACTING WITH OTHERS: These questions test for the ability to interact with other people, to gather and present information, and to provide assistance and advice in a courteous and professional manner.

TEST TASK: You will be presented with a variety of situations in which you must apply knowledge of how best to interact with other people.

SAMPLE QUESTION:

A person approaches you expressing anger about a recent action by your department. Which one of the following should be your **first** response to this person?

A. Interrupt to say you cannot discuss the situation until he calms down.
B. Say you are sorry that he has been negatively affected by your department's action.
C. Listen and express understanding that he has been upset by your department's action.
D. Give him an explanation of the reasons for your department's action.

The correct answer to this sample question is C.

SOLUTION:

Choice A *is not correct. It would be inappropriate to interrupt. In addition, saying that you cannot discuss the situation until the person calms down will likely aggravate him further.*

Choice B *is not correct. Apologizing for your department's action implies that the action was improper.*

Choice C is the correct answer to this sample question. *By listening and expressing understanding that your department's action has upset him, you demonstrate that you have heard and understand his feelings and point of view.*

Choice D *is not correct. While an explanation of the reasons for the action may be appropriate at a later time, at this moment the person is angry and would not be receptive to such an explanation.*

- ***Therefore, the correct answer to this sample question is choice C.***

SUBJECT AREA

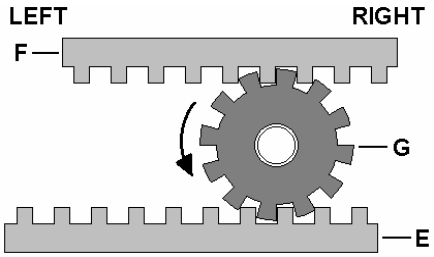
MECHANICAL REASONING: These questions will be accompanied by drawings or descriptions of various mechanical devices, such as gears, pulleys, levers, hand tools, and gauges. You will be required to demonstrate an understanding of how the devices work and the underlying mechanical principles involved. These devices are not limited to use in the fire service. .

TEST TASK: For each question, you will be presented with a sketch or description of one or more mechanical devices, hand tools, dials or gauges. You must understand how the devices work, how the devices are used, or how to read the devices, in order to answer the questions correctly.

SAMPLE QUESTION 1:

In the diagram below, how will the two racks, E and F, move when gear G is rotated on its fixed axis in the direction indicated by the arrow?

A. Both racks will move to the left.
B. Rack F will move to the left while rack E moves to the right.
C. Rack F will move to the right while rack E moves to the left.
D. Both racks will move to the right.



The correct answer to sample question 1 is B.

SOLUTION: *To answer this question correctly, you should look at each part of the mechanism separately:*

- *What will happen to rack F when gear G moves in the direction indicated by the arrow? The teeth in gear G will lock with the teeth in rack F and cause rack F to move to the left.*
- *What will happen to rack E when gear G moves in the direction indicated by the arrow? The teeth in gear G will lock with the teeth in rack E and cause rack E to move to the right.*
- ***Therefore, the correct answer to sample question 1 is B.***

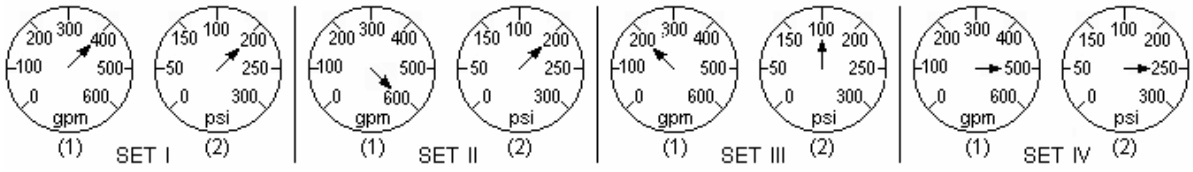
SUBJECT AREA

MECHANICAL REASONING (cont.)

SAMPLE QUESTION 2:

The diagram below shows four sets of dials. Dial (1) in each set displays gallons per minute (gpm) flow rate. Dial (2) in each set displays pressure per square inch (psi). If a pump works most efficiently at a flow rate of less than 500 gpm and a pressure of 200 psi, which one of the sets of dials indicates a pump that is working most efficiently?

A. SET I
B. SET II
C. SET III
D. SET IV



The correct answer to sample question 2 is A.

SOLUTION: *To answer this question correctly, you must apply the information given in the problem to the readings on the dials, in order to determine which set of dials indicates a pump that is working most efficiently:*

- *The problem tells you that a pump works most efficiently at a flow rate of less than 500 gpm and a pressure of 200 psi.*
- *The problem also tells you that dial (1) in each set displays gallons per minute (gpm) and dial (2) in each set displays pressure per square inch.*
- *Of the four sets, SET I is the only set that has a flow rate less than 500 gpm <u>and</u> a pressure of 200 psi (reading on dial (2)).*
- ***Therefore, the correct answer to sample question 2 is SET I (choice A).***

SUBJECT AREA

UNDERSTANDING AND INTERPRETING WRITTEN MATERIAL PERTAINING TO FIRE: The questions in this subtest test how well the candidate comprehends written material. The candidate is provided with brief reading selections, followed by a set of alternative statements relating to each selection. The candidate is to indicate the most appropriate statement relating to the selection on the basis of whether it: a) accurately paraphrases portions of the selection; or b) adequately summarizes the selection; or c) presents an inference that can reasonably be drawn from the selection.

The reading selections are drawn from a variety of sources related to the fire fighting field. Knowledge of the subject matter of the reading selection is generally not related to successfully answering the questions.

TEST TASK: For each question, you will be provided with a brief selection of written material pertaining to fire, followed by a question and a set of alternative statements relating to the written material. You must choose the statement that best answers the question.

SAMPLE QUESTION:

> "Oxidizing materials shall include a substance that yields oxygen readily to stimulate the combustion of organic matter. Oxidizing materials shall be stored in cool, dry, ventilated locations, and separated from stored organic materials. Oxidizing materials shall be stored separately from flammable liquids, flammable solids, combustible materials, hazardous chemicals, corrosive liquids, and other such non-compatible materials. Bulk oxidizing materials shall not be stored on or against wooden surfaces."
>
> Which one of the following statements is correct, based on the written material provided above?
>
> A. Organic materials should be stored on wooden piles.
> B. Oxidizing materials should be stored with flammable solids.
> C. Corrosive liquids should be stored with hazardous chemicals.
> D. Oxidizing materials should be stored away from organic materials.
>
> *The correct answer to this sample question is D.*

SOLUTION: *To answer this question correctly, you must evaluate each choice given, against the written material provided, in order to determine which choice is correct.*

Choice A *states, "Organic materials should be stored on wooden piles." Although the written material states that "oxidizing materials shall be stored… separated from stored organic materials," the written material does not state where organic materials should be stored. Therefore, choice A is not the correct answer to this sample question.*

Choice B *states, "Oxidizing materials should be stored with flammable solids." However, the written material states, "Oxidizing materials shall be stored separately from… flammable solids,…" Therefore, choice B is not the correct answer to this sample question.*

Choice C *states, "Corrosive liquids should be stored with hazardous chemicals." However, the written material does not state where corrosive liquids should be stored. Therefore, choice C is not the correct answer to this sample question.*

Choice D *states, "Oxidizing materials should be stored away from organic materials." The written material states, "Oxidizing materials shall be stored… separated from stored organic materials."*

Therefore, choice D is the correct answer to this sample question.

SUBJECT AREA

SOLVING PROBLEMS INVOLVING NUMBERS: This subtest requires the candidate to use addition, subtraction, multiplication, and division to solve problems that might be encountered in fire service activities. In some of the questions, sketches of simple geometric figures may be shown or simple geometric terms used. The problems are presented in the context of the job. Knowledge of fire fighting is not required. Formulas or equations will be provided where required.

TEST TASK: For these questions, you will be presented with various problems, involving numbers, that might be encountered in fire service activities. Formulas will be provided where needed. You will be allowed to use a calculator for this part of the test.

SAMPLE QUESTION 1:

A pump discharges water at a rate of 184 gallons per minute. Which one of the following is the number of gallons of water this pump will discharge in an hour?

A. 1,104 gallons
B. 1,840 gallons
C. 2,208 gallons
D. 11,040 gallons

The correct answer to sample question 1 is D.

SOLUTION TO SAMPLE QUESTION 1:

- *First, you must know that there are 60 minutes in an hour. Then, you must multiply 184 gallons (the amount the pump discharges in one minute), by 60 minutes (the number of minutes in an hour), in order to calculate the number of gallons the pump discharges in one hour.*
- **The correct answer to sample question 1 is 11,040 gallons (choice D).**

SAMPLE QUESTION 2:

"Back pressure" is the pressure, measured in pounds per square inch (psi), which a column of water exerts against the engine or hydrant, which is forcing the water through a pipe system or a hose stretched to a height. Back pressure can be found by multiplying 0.434 by the height of the pipe system, in feet.

If the height of the pipe system is 180 feet, which one of the following is most nearly the back pressure?

A. 7.8 psi
B. 78.1 psi
C. 708.2 psi
D. 7812.0 psi

The correct answer to sample question 2 is B.

SOLUTION TO SAMPLE QUESTION 2:

- *Since this problem tells you that back pressure can be found by multiplying 0.434 by the height of the pipe system, in feet, to answer this question correctly, you must multiply 0.434 by 180 feet, and know where the decimal point should be placed.*
- ***The correct answer to sample question 2 is 78.1 psi (choice B).***

SUBJECT AREA

GENERAL SCIENCE: This subtest requires the candidate to demonstrate knowledge of the basic principles of physics and chemistry, or the definitions of relevant terms, properties and processes; or to apply the knowledge to given situations. The questions cover, but are not necessarily limited to, properties of common substances encountered in fire fighting, basic principles of electricity, and basic principles of combustion and heat transfer.

TEST TASK: You will be presented with questions which require a knowledge of general science, or the application of basic science principles to given situations, to answer correctly. Specialized knowledge of firefighting is not needed to answer the questions.

SAMPLE QUESTION 1:

The density of a substance refers to which one of the following qualities?

A. solubility
B. compactness
C. alkalinity
D. weight

The correct answer to sample question 1 is B.

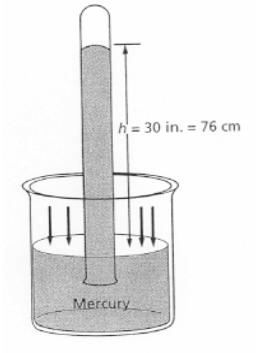
SOLUTION TO SAMPLE QUESTION 1:

- *To answer this question correctly, you must know that density is the amount of mass in a definite volume, or how compact or crowded a substance is*
- ***Therefore, choice B, compactness, is the correct answer to sample question 1.***

SAMPLE QUESTION 2:

The diagram below shows a filled test tube of mercury inverted in a beaker of mercury. Which one of the following is responsible for supporting the column of mercury?

A. air temperature
B. atmospheric pressure
C. salinity of the mercury
D. viscosity of the mercury



SOLUTION TO SAMPLE QUESTION 2:

- *To answer this question correctly, you must know that force is required to support the weight of the column of mercury, and that the force needed is atmospheric pressure. Atmospheric pressure on the surface of the mercury in the beaker is supporting the column of mercury in the tube.*
- ***Therefore, the correct answer to sample question 2 is atmospheric pressure (choice B).***

SUBJECT AREA

REASONING CLEARLY AND SELECTING A PROPER COURSE OF ACTION IN FIREFIGHTING SITUATIONS: The questions in this subtest describe situations which a firefighter may encounter on the job. The candidate must evaluate the situation and either select the most appropriate course of action or select the best reason in support of a particular course of action. The questions cover such areas as interpersonal factors related to dealing with other firefighters, superior officers or the general public. Specialized or detailed knowledge of firefighting is not required.

TEST TASK: For each question, you will be presented with a brief description of a situation which a firefighter may encounter on the job, followed by four alternative courses of action. You must evaluate the situation given and select, from among the four choices given, the most appropriate course of action or best answer to the question.

SAMPLE QUESTION:

You have been on the job as a firefighter for six months. After your company returns to the station from a fire alarm, your supervisor, the company officer, tells you to perform a safety check of the fire vehicle just used. On your way to conduct the safety check, the fire chief approaches you and informs you that city officials will be coming for a tour of the fire department, and that he would like you to wash the fire vehicle immediately.

Which one of the following would be the best course of action for you to take in this situation?

A. Say nothing and wash the fire vehicle as ordered.
B. Say nothing and proceed with the safety inspection of the fire vehicle.
C. Inform the fire chief of the order you were given by the company officer.
D. Tell the fire chief that you will wash the fire vehicle right after you complete its safety inspection.

The best answer to this sample question is C.

SOLUTION: *In the situation described, you receive conflicting orders from your immediate supervisor (the company officer) and the fire chief. The order from your immediate supervisor is a safety matter; the order from the fire chief is a public relations matter. To answer this question correctly, you must evaluate the situation and realize that the most appropriate action for you to take is to inform the fire chief of the order you were given by the company officer. The fire chief can then decide what to do.* ***Therefore, the best answer to this sample question is C.***

TEST SECURITY

The test you will be taking is the property of the New York State Department of Civil Service. Candidates may not remove test material from the test site and may not reproduce, reconstruct, or discuss the test content with others. Unauthorized possession or disclosure of the test material is prohibited by law and punishable by imprisonment and/or a fine. Additionally, candidates may be disqualified from appointment to the positions for which the examination is being held and from being a candidate for any civil service examination for five years. After you take the test, other individuals may want to talk with you about the test. You should not discuss the questions and answers, even in general terms. You should be careful that you do not inadvertently violate test security and put yourself at risk.

CONCLUSION

Your attitude and approach to the test will influence how well you perform. A positive attitude will help you do your best.

Before the test ...

- Study and review this guide to familiarize yourself with what the test will cover.
- Study and review the subject areas that will be covered on the test.

On the day of the test ...

- Arrive at the test site on time.
- Bring your Admission Notice, two No. 2 pencils, a photo ID containing your signature, a quiet lunch or snack, and any other **allowed** materials.
- Do **NOT** bring this test guide to the test site.

At the test site …

- Do **NOT** bring cell phones, beepers, headphones, or any electronic or other communication devices to the test site.
- The use of such devices anywhere on the grounds of the test site (this includes the test room, hallways, restrooms, building, grounds, and parking lots) could result in your disqualification.

During the test ...

- Read and follow all directions on your Admission Notice, test booklets, answer sheets, and Candidate Directions.
- Follow the Monitor's instructions.
- Keep track of the time.

After the test ...

- Do **NOT** remove any test materials from the test room.
- Do **NOT** paraphrase, reconstruct, or reproduce the test material in any way.
- Do **NOT** discuss the test material with others.

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