



**Department of  
Civil Service**

# A Guide to the Written Test

for the

## Firefighter Examinations

(For Mount Vernon, New Rochelle, and White Plains **only**)

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# TEST GUIDE

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## **GENERAL INFORMATION**

**Introduction:** The New York State Department of Civil Service has developed this test guide to familiarize you with the written test used for the Firefighter *examination series* **FOR WHITE PLAINS, MT. VERNON, and NEW ROCHELLE ONLY**. The information presented below may help you in preparing to take one or more of the examinations in this examination series.

**What is an examination series:** An examination series is a collection of examinations that are held on the same date and use the same test booklet(s). Examination series may contain just a few examinations or several hundred.

**Determining the Subject Areas in your examination(s):** To determine the subject areas that are included in your examination(s), you should refer to the Examination Announcement(s) for the particular examination(s) you will be taking. The subject areas are listed under the heading "Subjects of Examination."

**Using the Candidate Directions provided at the test site:** When you take your examination(s), you will be given a set of Candidate Directions. Read these very carefully so that you correctly identify the questions you need to answer for the examinations you are taking.

**Test questions:** All the test questions included in the Firefighter examination series are multiple-choice questions. No specialized knowledge of firefighting is required. See the *sample questions* in the subject area sections in this test guide for examples.

**Subject area information:** After the list of subject areas, information is provided on how candidates will be tested in each of the subject areas listed. For each subject area, a Test Task is provided. This is an explanation of how questions will be presented and how to correctly answer them. Read each explanation carefully. (Please note: This test guide may not provide information on every subject area included in your examination.)

**Sample questions:** This test guide provides at least one sample question for each subject area listed. The sample questions will be similar to what will be presented in the test booklet(s). This test guide provides the Solution and correct answer for each sample question presented. You should study these in order to understand how the correct or best answers were determined.

**Test security:** Please read the brief discussion on Test Security provided at the end of this guide. It provides an explanation of test takers' obligations and responsibilities.

**Helpful tips for taking the test:** The last section of this guide contains some helpful tips on how to prepare for and take a Civil Service test.

## **LIST OF SUBJECT AREAS**

1. **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.
2. **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 firefighting field. Knowledge of the subject matter of the reading selection is generally not related to successfully answering the questions.
3. **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 firefighting is not required. Formulas or equations will be provided where required.
4. **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 firefighting, basic principles of electricity, and basic principles of combustion and heat transfer.
5. **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.

## **SUBJECT AREA 1**

**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.

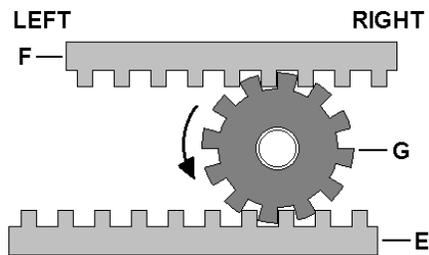
These devices are not limited to use in the fire service.

**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.*

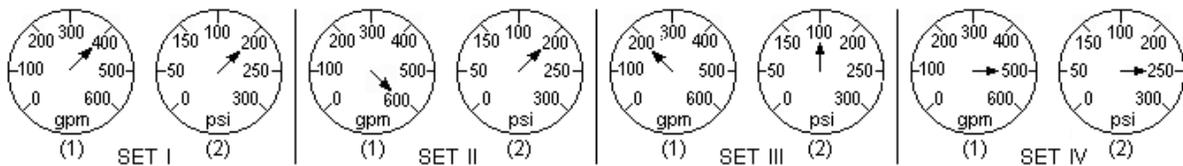
## **SUBJECT AREA 1 (cont.)**

### **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 and a pressure of 200 psi (reading on dial (2)).*

## **SUBJECT AREA 2**

**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 firefighting 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."

## **SUBJECT AREA 3**

**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 firefighting 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.*

### **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.*

## **SUBJECT AREA 4**

**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 firefighting, 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

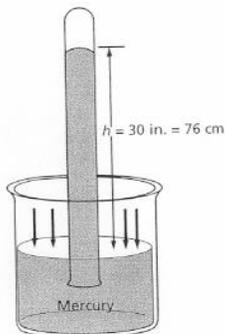
*The correct answer to sample question 1 is B.*

**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*

### **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



*The correct answer to sample question 2 is B.*

**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.*

## **SUBJECT AREA 5**

**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.*

## **TEST SECURITY**

The test candidates 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 who violate this policy 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 candidates take the test, other individuals may want to talk with them about the test. Candidates should not discuss the questions and answers, even in general terms. Candidates should be careful that they do not inadvertently violate test security and put themselves at risk.

## **HELPFUL TIPS FOR TAKING THE TEST**

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.
- Read the *General Guide to Written Tests* on our website, [www.cs.ny.gov/testing/testguides.cfm](http://www.cs.ny.gov/testing/testguides.cfm).
- Get plenty of rest the night before 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.
- Before choosing an answer, read all of the answer choices.
- Be sure the answer you mark on your answer sheet corresponds to the response option you are choosing.
- Be sure the question number on your answer sheet corresponds to the number of the exam question you are answering.
- Keep track of 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.

It is the policy of the New York State Department of Civil Service to provide reasonable accommodation to ensure effective communication of information to individuals with disabilities. If you need an auxiliary aid or service to make this information available to you, please contact the New York State Department of Civil Service Public Information Office at (518) 457-9375.

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