

# **FIRE DEPARTMENT**

## **CITY OF NEW YORK**



# ***TEST PREPARATION***

## ***MANUAL***

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# INTRODUCTION

This Study Guide has been distributed to help candidates prepare for the New York City Firefighter's Examination. This particular guide focuses primarily on the written exam. The written exam will consist of 100 multiple-choice questions designed to test candidates on nine ability areas. These abilities include such areas as memorization, spatial orientation, written comprehension and problem sensitivity. The complete set of ability areas is identified and defined within this guide.

## WRITTEN EXAM

The written portion of this guide is divided into three major sections as follows:

Section I: General Test Information (pages 1-9). The first section of the guide provides candidates with information that is useful when taking any kind of multiple choice test. Candidates are provided with suggested test-taking strategies (such as underlining important words in questions), a strategy for analyzing and avoiding errors, and instructions regarding the answer sheet to be used at the actual exam.

Section II: Ability Areas (pages 10-33). The second section of the guide focuses on the nine ability areas that will be tested. For each ability area, candidates are provided with a definition, test-taking strategies they can use to help them answer questions testing the area, sample questions and explanations of the answers to these sample questions.

Section III: Practice Exam (pages 34-61). The third section of the guide contains a practice exam including questions covering all nine ability areas and explanations of the answers to these questions. Candidates can take this practice exam after reviewing the written portion of this guide to assess their understanding of the information and test-taking strategies presented. Additionally, taking the practice exam will allow candidates to assess their current level of performance, as well as identify those ability areas upon which they will need to focus their study efforts.

Please note that the practice exam takes up almost half of the written portion of this guide.

Candidates are encouraged to review the written portion of this guide as many times as necessary to become comfortable with the information and test-taking strategies presented.

## PHYSICAL CONDITIONING OVERVIEW

In addition to information about the written exam, an overview of some medical, health and physical fitness concerns and suggestions is provided at the end of this guide (on pages 62 to 71) to help candidates begin preparing for the physical exam. This overview is meant simply to give candidates an idea of what to expect and how to prepare for the physical exam..

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# **GENERAL TEST INFORMATION**

## **SECTION I: OBJECTIVES**

The objectives of this guide are outlined briefly below:

### **A. To Familiarize Candidates with the Nine Ability Areas on Which They Will Be Tested.**

The nine abilities include memorization, visualization, spatial orientation, written comprehension, written expression, information ordering, problem sensitivity, deductive reasoning and inductive reasoning. Candidates will be provided with definitions of these ability areas and examples of how they apply to the job of an entry-level firefighter.

### **B. To Provide Candidates with Test-Taking Strategies to Be Used for Each of the Nine Ability Areas.**

Candidates will be provided with strategies to help them answer questions testing each of the nine ability areas.

### **C. To Provide Candidates with Some General Test-Taking Strategies.**

Some general suggestions will be made for taking multiple-choice exams such as this one. These strategies include suggestions as circling key words in questions and answering easier questions first.

### **D. To Familiarize Candidates with the Procedures and Materials They May Encounter During the Actual Examination.**

Candidates will be provided with information about the procedures to be followed during the exam. Additionally they will be given an opportunity to practice taking a sample exam that will give them a good idea of the kinds of questions to expect. Taking this practice exam will allow candidates to assess their own abilities and identify those ability areas upon which they should focus their study efforts. In addition, taking this practice exam should help to reduce candidate anxiety or fear. Some of the fear associated with test-taking situations is related to the novelty of the situation. In other words, candidates simply are not used to taking tests and are not quite sure of what they'll be facing. Giving candidates first-hand experience with the test-taking situation through the use of this practice exam should help reduce candidate fears.

### **E. To Provide Candidates with Information About Common Test-Taking Errors and Strategies for Avoiding Them.**

Candidates will be provided with information about errors typically made in tests such as these. They also will be shown how to analyze their own errors and avoid making the same errors in the future.

Candidates will be presented with a great deal of information in this Study Guide. This guide was not prepared to overwhelm candidates by giving them too many strategies to think about for each question they answer on the actual exam. However, there are a couple of things you should keep in mind:

1. The more familiar you become with the strategies suggested in this Study Guide, the more automatic they will become. REPETITION and PRACTICE are the keys. The more often you review this Study Guide, the better off you will be.
2. Many of the strategies suggested for each of the nine ability areas apply only to questions testing those areas. For example, you'll see that the suggestions for dealing with memory items apply only to those kinds of items. By becoming very familiar with these strategies, you will be able to quickly and easily decide which strategies to apply to each kind of question.
3. Some of the general test-taking techniques that are relevant to all questions are useful only when you cannot answer a question easily. For example, try using a code such as good, bad, and possible, to evaluate the answers to a question. This is helpful when dealing with difficult questions, particularly those you might skip until later on. However, if you are 100% sure of an answer, you should simply fill in the correct answer. For such items you will need to apply very few, if any, of the suggestions in this Study Guide. However, there are some strategies, such as underlining or circling key words and phrases that do not take much time and are useful for almost all items.

## **SECTION II: GENERAL TEST-TAKING STRATEGIES**

To do your best on the examination, here is a list of general test-taking strategies:

### **A. Make sure you understand the test format and requirements.**

1. Make sure you read all of the directions carefully.
2. Make sure you know how to correctly mark the answer sheet. (See p. 9.)
3. Make sure you know how much time you have to complete the examination. (You will receive a period of time of instructions and then will be given approximately four to five hours to complete the 100-item examination. The exact schedule will be provided at the test site.) As you take the test, check your watch every once in a while so that you can keep track of the amount of time remaining in the examination period.

### **B. Make sure you understand the question.**

4. Read each question carefully. Try to answer the question before you look at the alternatives (answer choices). If you know the answer, compare it to the available alternatives and pick the closest one.
5. You will be free to write in your test booklet, so mark the test questions in a way that makes them easier to read. Specifically:
  - a. Use slash marks to break down long sentences into smaller parts. This will help you focus on each separate idea presented in the sentence.
  - b. Circle key words that explain a sentence or passage. This helps you focus on the important parts of the sentence. It also makes it easier when you have to hunt for the answers later.
  - c. Find and underline clue words such as some, all, every, sometimes, and, and or.
    - 1) Words such as all, never, none and every harden a sentence by indicating there are no exceptions. As a rule, alternatives with these words have less chance of being correct
    - 2) Words such as sometimes, may, generally and possibly soften a statement and leave more room for the alternative to be correct.
    - 3) AND means that one part of the alternative must be true in addition to another for the alternative to be correct. OR means there is a choice of situations; only one part of the alternative must be true for it to be a correct alternative.

**C. Proceed through the questions strategically.**

6. Answer easy questions first.

When you go through each question on the exam, answer the easy questions first and go back to the difficult ones. This will prevent you from spending too much time on any one question and ensure that you have the time to respond to, and receive credit for, every question that you can answer easily and correctly. Whenever you do skip a question, use some kind of mark to identify it as skipped in your test booklet and don't forget to return to it.

7. Don't get stuck on words or sentences you do not understand.

You may get the main idea of the sentence or paragraph without understanding the individual word or the individual sentence.

8. Use the process of elimination.

If you don't know the answer to a question, cross off those alternatives you clearly know are wrong. Then, put a mark next to each remaining alternative to indicate what you think about it (e.g., bad, good or possible). This will save you time, particularly if you decide to skip the question and come back to it later, by reducing the number of alternatives you have to reread and re-evaluate before making your final choice.

9. Guess.

There is no added penalty for incorrect answers or guesses on this examination, so be sure to put down an answer for every question. If the exam period is about to end and you believe there will be some questions that you will not be able to complete, save some time (e.g., one or two minutes) toward the very end of the exam period to answer these questions, even if you must guess. Although your guesses may not be correct, the alternative is to leave these questions blank and be assured of getting them wrong.

**D. Use extra time wisely.**

10. If you finish the examination before the exam period is over, go back and review your answers. Make any changes that are necessary. Also, make sure that you have placed your answers on the answer sheet correctly.

## **SECTION III: ERROR ANALYSIS**

### **A. Strategies for Analyzing and Avoiding Errors**

Each one of us has weak areas in our test-taking behavior. It is to your advantage to identify those weak areas before taking the Firefighter Examination. That is why this Error Analysis procedure is being explained now. The sample questions contained in the Ability Area and Practice Exam sections within this Study Guide are similar to the questions that will appear on the actual examination. After answering these questions and checking them against the answers and explanations, you should complete the Error Analysis Form described on page 8. One copy of this form has been provided on page 8 for the sample questions contained in the Ability Area section of the guide. A second copy of this form has been provided on page 53 for the Practice Exam questions. After completing each of these forms, focus on the questions you answered incorrectly. This will allow you to identify the major weak areas in your test-taking behavior. This is called Error Analysis.

There are several possible reasons for choosing an incorrect response to a question. Seven of these reasons are presented below, along with suggestions for avoiding such errors. Once you've identified the reason for choosing an incorrect response, it will be easier to correct it. In turn, making it easier to answer that kind of question correctly in the future.

#### **Reasons for Choosing Incorrect Responses**

##### **1. Marking the wrong space on the answer sheet.**

Since there are a limited number of questions on the exam, careless errors such as these are costly. Check yourself as you mark each answer choice on the answer sheet to ensure you are marking the answer you have chosen. Also, make sure you are responding to the correct question and filling in the right space. As an additional check, after you complete the exam, go back over every question and answer again. (See instructions for using the answer sheet on page 9.)

##### **2. Misreading question or answer by overlooking a key word or phrase.**

The solution to this problem is underlining, underlining makes those key words and phrases stand out when choosing an answer. Once you have underlined the key words and phrases in a question, check the details of the possible answers with the details you underlined, one-by-one. If every detail doesn't match, consider that answer suspect and try another, always keeping in mind you're looking for the best possible answer.

##### **3. Not knowing the meaning of one or more key terms.**

This is a problem of vocabulary. When you come to an unfamiliar word, reread the sentence to determine its meaning without worrying about the meaning of the unfamiliar word. Try to understand the general message of the sentence or paragraph. The meaning of the unfamiliar word should become clearer once you understand the phrases and ideas that surround it.

4. **Having difficulty telling the difference between the important and unimportant parts of a question because it is complicated or difficult to understand.**

First of all, these are the questions you should skip until the end of the test. These are also the questions on which you will use the slash mark technique mentioned earlier among the general test-taking strategies (see p. 3). It's called divide and conquer. Use slash marks to break up the question into smaller parts; then concentrate on one part at a time. When you do go back to these difficult questions, first read the possible answers before reading the question. This tells you what to concentrate on while reading the question. Also, focus on the topic sentences that are usually the first and last sentences in a question. And, again, read the difficult questions twice. The first time, read for the general idea and do not get stuck on individual words or phrases you do not understand. The second time, read for more detailed understanding. The first reading will give you the general meaning so that the second reading will be easier. Lastly, picture in your mind what the question is asking.

5. **Not being used to comparing combinations of information.**

This is a problem of re-arranging information in the correct way so that it makes sense. Underline important pieces of information in the question and then compare this information with the possible answers, point-by-point. Also, concentrate on eliminating the wrong answers first.

6. **Choosing an answer simply because it "looks" good.**

Several factors may cause you to fall for incorrect answers that look good:

- a) An incorrect answer may contain an exact phrase from the original question.
- b) An incorrect answer may contain a phrase or sentence from the original question presented it in a different way. For example, an idea that may be presented as an idea that was supported in the answer.
- c) An incorrect answer may overstate what the question has stated. For example, if question says, "Some fires..." the incorrect answer may say, "All fires..."

Some strategies for avoiding the tendency to fall for incorrect answers that look good include:

- a) Have an answer in mind before you look over the alternatives. This will make you less likely to choose an answer that just looks good.
- b) Use the method of marking each answer to indicate what you think about it (e.g., bad, good or possible) before choosing one.
- c) Beware of choosing answers based on common sense or previous knowledge and experience. Answer only on the basis of the material presented in the test question itself.
- d) Stick strictly to the facts or rules described in the test question itself. Don't fall for answers that stretch or exaggerate these facts or rules. This is the time to watch out for words such as "only," "never," "always," "whenever," "all," etc. etc.
- e) Beware of answers containing exact words or phrases from the question material. Don't simply assume that such answers are correct.
- f) Prepare a defense for your answer choice. Find something in the test question that will allow you to give a strong defense for your particular answer choice.

## **7. You may not know why you missed a question.**

Finally, if you just don't know why you missed a question because you don't know why the correct answer is correct, we suggest you review the Study Guide again. Also, talk with someone else who may be taking the test to compare answers and information or ask a tutor, friend or family member for help.

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Although the above list covers many of the factors that can cause you to choose an incorrect response, there are other factors that can cause you to make errors. Specifically, you may miss questions because you failed to provide an answer or were forced to quickly mark any answer (i.e., guess) before time was called. If either of these things happened, consider why. Possible reasons and suggestions include:

- 1) You may have missed a question because you skipped it and failed to come back to it later. Be sure you use some kind of code to identify skipped questions in your test booklet and remember to go back to them before the exam period is over.
- 2) You may have lost track of the time and been unaware that the exam period was about to end before you could mark any remaining unanswered questions. Be sure to check your watch every so often so that you can keep track of how much time you have left. If necessary, be sure to save the last minute or so to mark any unanswered questions.
- 2) You may have been forced to quickly mark answers (i.e., make guesses) for questions toward the end of the exam because you spent too much time working on difficult questions, rather than skipping them and saving them for later. Or, if you did skip difficult questions, you may have failed to code the various alternative; for example, bad, good and possible. Thus, you did not reduce the number of alternatives you had to reconsider when you reread the questions. Be sure that you use a code not only to identify skipped items, but also to evaluate any alternative that you do review so that you can save yourself some time rereading and re-evaluating.

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***Remember, as you review your answers to the sample questions contained in the Ability Area and Practice Exam sections of this guide, use the Error Analysis Forms contained on page 8 (for Ability Area questions) and page 53 (for Practice Exam questions) to evaluate or diagnose your test-taking behavior.***

**B. Instructions for Using the Error Analysis Form**

Use the form below to analyze sample questions you answer incorrectly in the next (Ability Area) section of this guide. As you work through the Ability Area section, review each sample question as follows: If you answered the question correctly, place a check mark in the blank within the column labeled correct. Examine the ability areas listed for each incorrectly answered question to determine those abilities that are giving you the most difficulty. Then, for each incorrect answer, identify which of the seven reasons (see pages 5-7) caused you to make the error and mark the appropriate blank in the set of columns labeled INCORRECT ANSWERS. Total the number of marks in each column to identify the kinds of errors you are most likely to make. Once you have identified the troublesome ability areas and errors, go back and review the test-taking strategies for the ability areas and the strategies for avoiding errors. Focus on those areas and errors that are causing you to choose incorrect answers. *Another Error Analysis Form appears in the Practice Exam section of this guide (see p. 53). Use that form to analyze errors that you make on the practice exam.*

**C. Error Analysis Form: Sample Items**

SAMPLE ITEM NO.	ABILITY AREA	CORRECT?	INCORRECT ANSWERS						
			1	2	3	4	5	6	7
1	MEMORY	_____	___	___	___	___	___	___	___
2	MEMORY	_____	___	___	___	___	___	___	___
3	VISUAL	_____	___	___	___	___	___	___	___
4	VISUAL	_____	___	___	___	___	___	___	___
5	SPATIAL	_____	___	___	___	___	___	___	___
6	SPATIAL	_____	___	___	___	___	___	___	___
7	WRITTEN C	_____	___	___	___	___	___	___	___
8	WRITTEN C	_____	___	___	___	___	___	___	___
9	WRITTEN E	_____	___	___	___	___	___	___	___
10	WRITTEN E	_____	___	___	___	___	___	___	___
11	INF ORD	_____	___	___	___	___	___	___	___
12	INF ORD	_____	___	___	___	___	___	___	___
13	PROB	_____	___	___	___	___	___	___	___
14	PROB	_____	___	___	___	___	___	___	___
15	DEDUCT	_____	___	___	___	___	___	___	___
16	DEDUCT	_____	___	___	___	___	___	___	___
17	INDUCT	_____	___	___	___	___	___	___	___
18	NDUCT	_____	___	___	___	___	___	___	___
TOTAL ITEMS CORRECT		_____							
TOTAL FOR EACH KIND OF ERROR			___	___	___	___	___	___	___

## SECTION IV. ANSWER SHEET PROCEDURES

### A. Answer Sheet: Sample items

This is a sample of the answer sheet. Use this sample to record your answers to the 18 questions contained in the Ability Area section of this guide.

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Follow the test Instructions for candidates. Darken your answers in the ovals below. Do not write anything else on this page. USE NO. 2 SOFT PENCIL ONLY. See Instructions for sample questions.

WARNING: Be sure that the oval you darken under each choice corresponds to the question you are answering. BE SURE YOUR PENCIL MARKS ARE HEAVY AND BLACK. ERASE COMPLETELY ANY ANSWER YOU WISH TO CHANGE. DO NOT make stray pencil dots, dashes or marks ANYPLACE on this page.

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1 ( ) ( ) ( ) ( )	26 ( ) ( ) ( ) ( )	51 ( ) ( ) ( ) ( )	76 ( ) ( ) ( ) ( )
2 ( ) ( ) ( ) ( )	27 ( ) ( ) ( ) ( )	52 ( ) ( ) ( ) ( )	77 ( ) ( ) ( ) ( )
3 ( ) ( ) ( ) ( )	28 ( ) ( ) ( ) ( )	53 ( ) ( ) ( ) ( )	78 ( ) ( ) ( ) ( )
4 ( ) ( ) ( ) ( )	29 ( ) ( ) ( ) ( )	54 ( ) ( ) ( ) ( )	79 ( ) ( ) ( ) ( )
5 ( ) ( ) ( ) ( )	30 ( ) ( ) ( ) ( )	55 ( ) ( ) ( ) ( )	80 ( ) ( ) ( ) ( )
6 ( ) ( ) ( ) ( )	31 ( ) ( ) ( ) ( )	56 ( ) ( ) ( ) ( )	81 ( ) ( ) ( ) ( )
7 ( ) ( ) ( ) ( )	32 ( ) ( ) ( ) ( )	57 ( ) ( ) ( ) ( )	82 ( ) ( ) ( ) ( )
8 ( ) ( ) ( ) ( )	33 ( ) ( ) ( ) ( )	58 ( ) ( ) ( ) ( )	83 ( ) ( ) ( ) ( )
9 ( ) ( ) ( ) ( )	34 ( ) ( ) ( ) ( )	59 ( ) ( ) ( ) ( )	84 ( ) ( ) ( ) ( )
10 ( ) ( ) ( ) ( )	35 ( ) ( ) ( ) ( )	60 ( ) ( ) ( ) ( )	85 ( ) ( ) ( ) ( )
11 ( ) ( ) ( ) ( )	36 ( ) ( ) ( ) ( )	61 ( ) ( ) ( ) ( )	86 ( ) ( ) ( ) ( )
12 ( ) ( ) ( ) ( )	37 ( ) ( ) ( ) ( )	62 ( ) ( ) ( ) ( )	87 ( ) ( ) ( ) ( )
13 ( ) ( ) ( ) ( )	38 ( ) ( ) ( ) ( )	63 ( ) ( ) ( ) ( )	88 ( ) ( ) ( ) ( )
14 ( ) ( ) ( ) ( )	39 ( ) ( ) ( ) ( )	64 ( ) ( ) ( ) ( )	89 ( ) ( ) ( ) ( )
15 ( ) ( ) ( ) ( )	40 ( ) ( ) ( ) ( )	65 ( ) ( ) ( ) ( )	90 ( ) ( ) ( ) ( )
16 ( ) ( ) ( ) ( )	41 ( ) ( ) ( ) ( )	66 ( ) ( ) ( ) ( )	91 ( ) ( ) ( ) ( )
17 ( ) ( ) ( ) ( )	42 ( ) ( ) ( ) ( )	67 ( ) ( ) ( ) ( )	92 ( ) ( ) ( ) ( )
18 ( ) ( ) ( ) ( )	43 ( ) ( ) ( ) ( )	68 ( ) ( ) ( ) ( )	93 ( ) ( ) ( ) ( )
19 ( ) ( ) ( ) ( )	44 ( ) ( ) ( ) ( )	69 ( ) ( ) ( ) ( )	94 ( ) ( ) ( ) ( )
20 ( ) ( ) ( ) ( )	45 ( ) ( ) ( ) ( )	70 ( ) ( ) ( ) ( )	95 ( ) ( ) ( ) ( )
21 ( ) ( ) ( ) ( )	46 ( ) ( ) ( ) ( )	71 ( ) ( ) ( ) ( )	96 ( ) ( ) ( ) ( )
22 ( ) ( ) ( ) ( )	47 ( ) ( ) ( ) ( )	72 ( ) ( ) ( ) ( )	97 ( ) ( ) ( ) ( )
23 ( ) ( ) ( ) ( )	48 ( ) ( ) ( ) ( )	73 ( ) ( ) ( ) ( )	98 ( ) ( ) ( ) ( )
24 ( ) ( ) ( ) ( )	49 ( ) ( ) ( ) ( )	74 ( ) ( ) ( ) ( )	99 ( ) ( ) ( ) ( )
25 ( ) ( ) ( ) ( )	50 ( ) ( ) ( ) ( )	75 ( ) ( ) ( ) ( )	100 ( ) ( ) ( ) ( )

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## NINE ABILITY AREAS

The New York City Firefighter Examination is designed to test candidates on nine mental abilities that are essential to the performance of the firefighter's job. This section provides an overview of the nine ability areas, introduces candidates to the kinds of questions that will be used to test each ability area and provides candidates with some useful strategies for answering each kind of question. The sample questions contained in this section and the questions contained in the practice exam within this guide are similar to the questions that may appear on the actual examination. By practicing the suggested techniques on the sample and practice exam questions, candidates can enhance their test-taking skills.

For each ability area, the following information is provided:

- Definition: In this section, the ability area is defined and candidates are provided with examples of how the ability applies to the job of firefighter.
- Techniques: This section describes the various kinds of questions that will be used for each of the nine areas. For each kind of question, candidates will be given some strategies to assist them in responding to such questions.
- Examples: Sample questions have been provided to give candidates a fuller understanding of the kinds of questions they will see on the actual exam and the way in which the suggested test-taking strategies should be applied. Again, these sample questions are similar to those that may appear on the actual exam.
- Answers and Explanations: Answers and explanations have been provided directly below each set of sample questions. By answering the sample questions and reviewing the explanations, candidates can determine how well they understand the test-taking strategies presented. They also will be able to identify those ability areas on which they need to spend more time.

***Remember to use the answer sheet on page 9 and the error analysis form on page 8 to take and review the sample questions contained in this section of the guide.***

## **A. Memorization**

**Definition:** This is the ability to memorize and retain new information to which you are exposed and occurs as a routine part of the task or job. This ability does not include the ability to memorize procedures. An example of this would be remembering the layout of a building so that it would be possible to conduct a thorough search for victims and to exit the building. Another example would be remembering the specific details of a given street in the firefighter's assigned district so that firefighting vehicles and equipment could be placed in appropriate locations. This ability would also include memorizing maps and traffic patterns. This ability would not include the memory of information that develops out of the task situation, such as newspaper articles about events in other cities.

**Techniques:** The first questions on the actual exam may be memorization questions. Memorization questions may consist of a picture you'll be asked to study. This picture will show a situation of relevance to a firefighter. You'll be given a period of time (approximately five minutes.) to study the picture. After that, the picture will be collected from you, so it's important that you inspect it carefully. An approximately five-minute holding will follow the study period. During the hold period, you will be instructed to think about the picture. This hold period will allow you to absorb the details of the picture.

You may not be allowed to use your pencil to write on the picture or on anything else during the memory portion of the exam, but you can substitute with your fingers. Use your finger to circle, underline and emphasize important details. Circle the time on clocks, signs in windows, etc. Using your finger will highlight what your eyes see. Specifically:

Use your finger to **DRAW** two mental lines through the picture so you divide the picture into quarters. Then study a quarter of the picture at a time and compare the contents of each quarter.

**REPEAT** items to yourself constantly. You're exercising your memory this way.

**INSPECT** key information in each section of the picture through which you've drawn lines. Remember the important details; remember the little details.

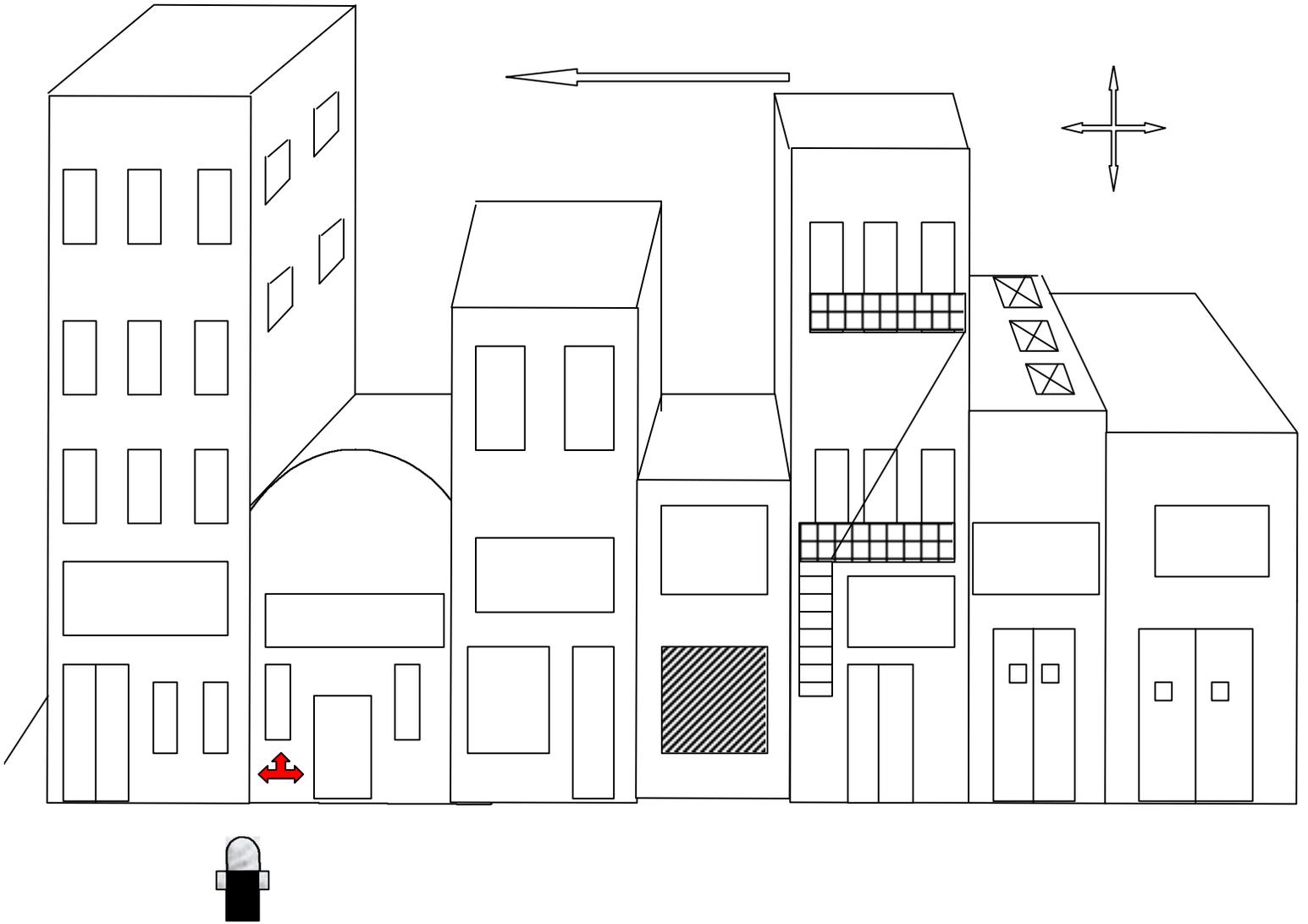
**VISUALIZE** things, events and people in your mind, whether it is pictures or words.

Lastly, order or **ARRANGE EVENTS** and things in your mind. Information that is in some order is easier to remember.

To summarize, remember the following code word: **DRIVE**

- D** Draw lines
- R** Repeat items
- I** Inspect information
- V** Visualize things
- E** Event ordering makes information easier to remember

Examples: Use the memory picture on this page to answer sample questions 1 and 2, on the next page, but do not look at the sample questions until after studying the picture. As noted above, study the picture for approximately five minutes; then put the picture aside and think about it for five minutes without looking at it. Finally, answer sample questions 1 and 2.



The building that would require the longest ladder to enable you to climb to the top floor would most likely be:

- A. 212 Pine Street
  - B. 216 Pine Street
  - C. 200 Pine Street
  - D. 220 Pine Street
2. As a firefighter, you are ordered by Lieutenant Greene to connect a hose-line to the automatic sprinkler Siamese connection. You would find this connection in front of:
- A. 220 Pine Street
  - B. 216 Pine Street
  - C. 200 Pine Street
  - D. 210 Pine Street

Answers and Explanations: Sample questions 1 and 2 are based on the memory picture provided. Refer back to the picture when reviewing the answers.

1. The correct answer is C. 200 Pine Street is the tallest of the four buildings.
2. The correct answer is D. the sprinkler siamese connection is located on the Hardware building, which is 210 Pine Street.

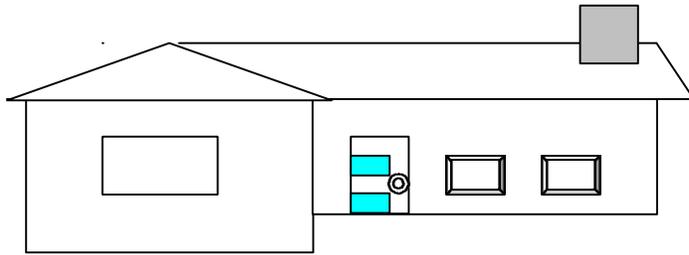
## **B. Visualization**

Definition: This tests your ability: to imagine how something would look when it is moved around or when its parts are moved or rearranged. As an example, a fire department supervisor may have to determine what areas of the fire scene will be affected if a building collapses; that is, where will the building fall and what will it hit? In the same way, a person with this ability would be able to visualize how a fire might move through a building and surrounding buildings.

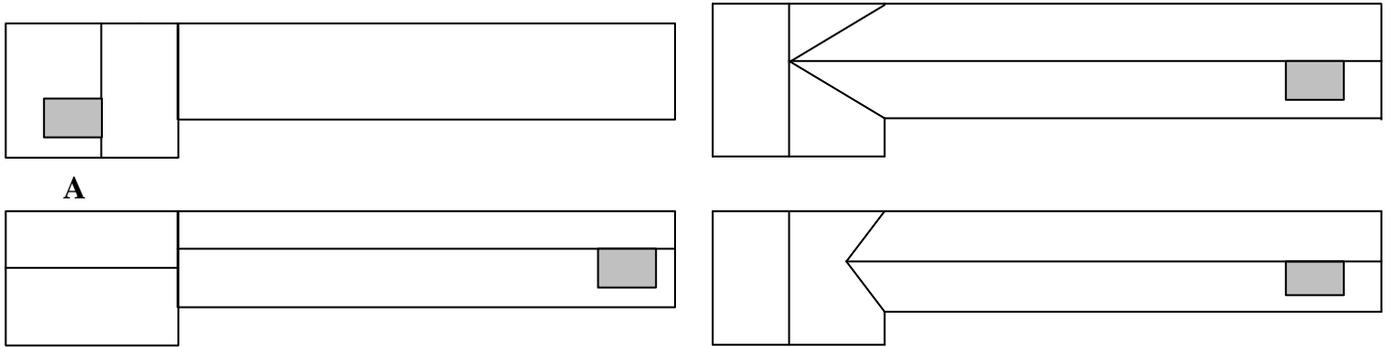
Techniques: Sample questions 3 and 4 are visualization questions. When reviewing questions like these, focus your attention on the parts of the object that are visible from all viewing angles. That is, focus on those parts of the object that you can see from the initial angle (e.g., from the front) and the angle from which the object is to be viewed when answering the question (e.g., from the back, from above or from inside). Compare each alternative with the initial object point by point, not as a whole. When making your comparisons, keep in mind that when objects are viewed from the back or inside, the parts of the object appear in the reverse position.

For example, consider sample question 3 in which you are shown the front of a house that has a chimney, door, windows and several sections, and then you are asked to identify the correct drawing of the house from above. Attention should be focused on those things that can be seen from both the initial angle (front) and the new angle (above). This includes the rooflines and the chimney. All other parts of the house (e.g., the windows and doors) should be ignored.

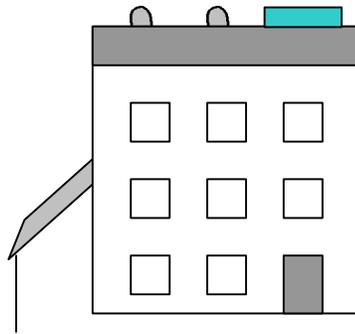
Examples: Use the drawing below to answer sample question 3.



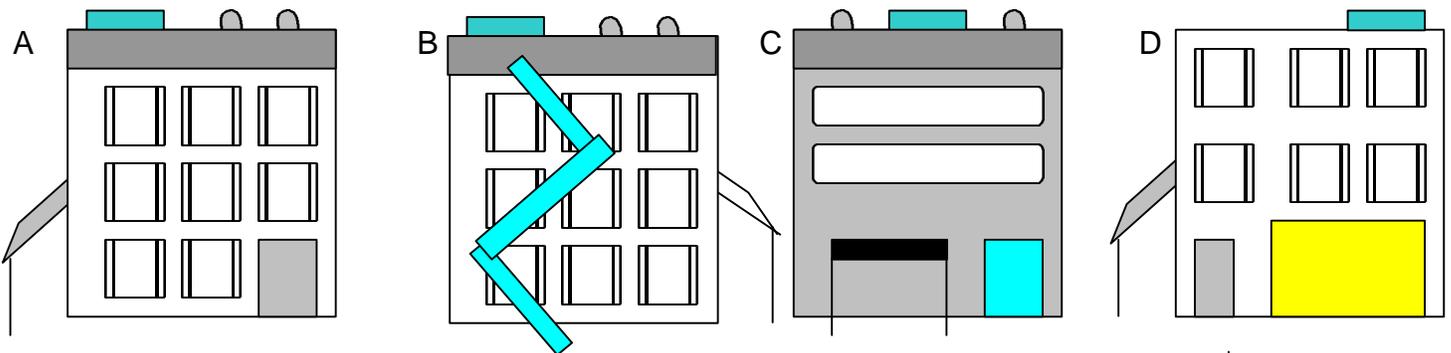
3. Shown above is a house as seen from the front. If Firefighter Moreno was standing on a 75-foot ladder, she would see the following scene from above:



**B**  
Use the drawing below to answer sample question 4.



4. Shown above is an apartment building as seen from the front. From the back, this apartment building would look like:



Answers and Explanations: In explaining each question, we have identified those parts of each object that candidates should attend to and those they should ignore. Then we have

explained each incorrect alternative by identifying the part of the object that is drawn incorrectly in that alternative.

3. The correct answer is C. Again, since the house is to be viewed from above, attention should be focused on the roof lines and the location of the chimney. Windows and doors should be ignored since they cannot be seen from above.

A is incorrect because the chimney appears in the wrong location on the roof.

B is incorrect because the roofline for the smaller section of the house is not drawn correctly. It is drawn horizontally rather than vertically.

D is incorrect because the roofline is drawn incorrectly in the area where the two sections of the house meet. The roofline for the larger section of the house should come to a point when it reaches the roofline for the smaller section of the house as shown in the correct alternative. Instead, the roofline for the larger section of the house is drawn so that it falls short of the roofline for the smaller section of the house.

4. B is the correct answer. Since the apartment building is to be viewed from the back, attention should be focused on those parts of the building that can be seen from the front and back. This includes the overhang on the side of the apartment building and the objects on the roof. Since the building is to be viewed from the back, these things appear in the reverse or opposite position in correct alternative B. Things that cannot be viewed from both the front and back should be ignored, such as the windows, door and the fire escape shown in alternative B

A is incorrect because the overhang appears in the same position as in the original apartment building, rather than being reversed as in correct alternative B.

C is incorrect because no overhang appears on this alternative and because only one of the three objects on the roof appears in the correct location.

D is incorrect because, as in alternative A, the overhang appears in the same position as in the original apartment building rather than being reversed. In addition, the square object on the roof does not appear in reverse position as it should. Finally, the round objects on the roof do not appear at all.

**Note: In addition to the above examples, you may be shown the front of a structure from the outside and asked to indicate what the front of the structure would look like from the inside. (See the practice exam in this guide for an example.)**

## **C: Spatial Orientation**

**Definition:** This is the ability to tell where you are in relation to the location of some object or to tell where the object is in relation to you. This ability helps an individual avoid getting lost in a particular space whether that space is a city, a building or a group of structures. With this ability, an individual should be able to look at a map or a layout of an area and determine his or her position in that area. This ability allows the person to answer the question, "If the environment looks like this, where am I?"

**Techniques:** Sample questions 5 and 6 measure the ability of spatial orientation. Spatial orientation questions often will use a map and ask you one of two things.

**Type 1:** The first type of question (see sample question 5) may ask you to pick the best route that you can take to get from one point to another, without breaking any traffic laws. Generally, there are two reasons why a suggested route would not be acceptable: the route may suggest that you break traffic laws by driving down a one-way street in the wrong direction. Or the suggested route may not represent the quickest route to the fire; there may be an alternative that suggests another route that goes more directly to the fire.

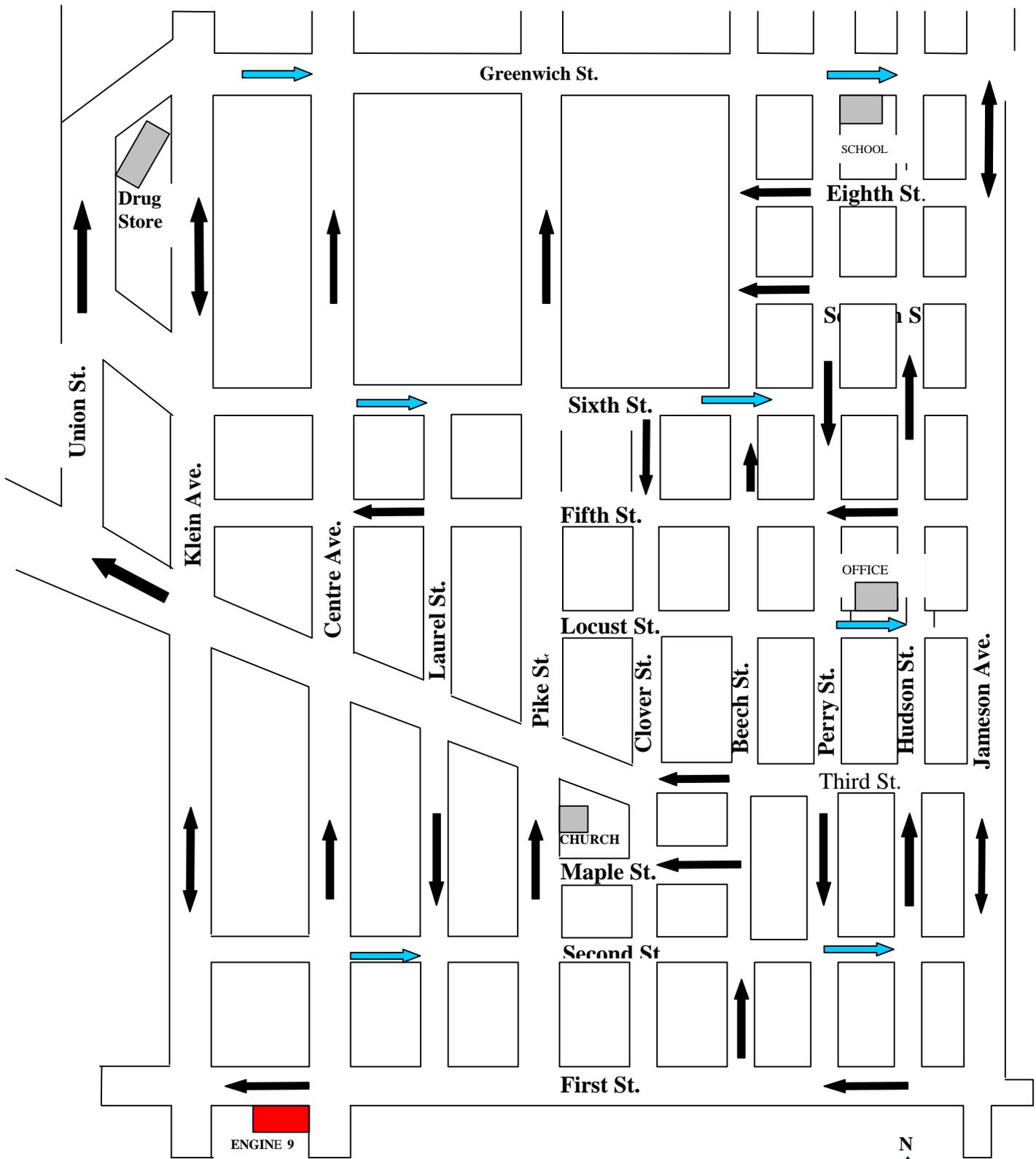
**Type 2:** The second type of question (see sample question 6) may give you a set of directions and ask you to indicate where you will be located if you follow these directions.

Trace the route described in each alternative when answering either kind of question (with your finger or, preferably, a pencil). Erase the route completely if you make an error. Turn the map in any way necessary (e.g., sideways, upside down) to make it easier for you to understand the directions. If there is more than one question using the same map, erase any lines you drew when answering the first question. If you don't, your lines will clutter the map and confuse you. Finally, when answering these questions, you should pay particular attention to two things, 1- the compass identifying the directions (north, south, east, west) and 2- the arrows indicating the direction and flow of traffic (one-way street or two-way street).

### **Examples:**

Use the map on the next page to answer sample questions 5 and 6. The arrows on the map indicate the flow of traffic.

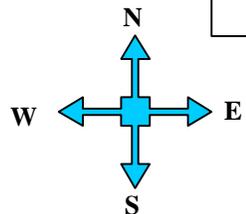
5. Firefighters at Engine Company 9 are dispatched to respond to a fire at a drug store on Union Street (between Sixth Street and Greenwich Street). The most direct route to the fire without breaking any traffic laws is as follows:
  - A. travel north on Centre Ave., northwest on Third St., north on Klein Ave., west on Sixth St., and north on Union St. to the fire.
  - B. travel north on Centre Ave., west on Greenwich St., and south on Union St. to the fire.
  - C. travel north on Centre Ave., northwest on Third St., and north on Union St. to the fire.
  - D. travel north on Centre Ave., west on Sixth St., and north on Union St. to the fire.
  
6. Firefighters at Engine Company 9 are dispatched to respond to a fire. Assume they start their trip from the intersection of Centre Avenue and First Street. To get to the fire, they travel north for 1 block, then turn east and travel 6 blocks, then turn north and travel 3 blocks, and finally turn west and travel 2 blocks to the fire. The fire is closest to the intersection of:
  - A. South St. and Beech St.
  - B. Seventh St. and Perry St.
  - C. Locust St. and Clover St.
  - D. Fifth St. and Beech St.



**Use this map to answer questions 5 and 6**

 Single arrow represents one-way street

 Arrows pointing in both directions represent two-way Streets



Answers and explanations:

5. C is the most direct route to the fire without breaking any traffic laws.

A is incorrect because it suggests the firefighters travel in the wrong direction (i.e., west) on Sixth.

B is incorrect because it suggests the firefighters travel in the wrong direction on Greenwich (i.e., west) and on Union (i.e., south).

D is incorrect because it suggests the firefighters travel in the wrong direction (i.e., west) on Sixth.

6. D is the correct answer. Question 6 can be explained by tracing the path described. Candidates may get these kinds of questions wrong if they travel the wrong number of blocks or in the wrong direction, skip a step, etc. Be sure to read the directions carefully.

### **D. Written Comprehension**

Definition: This is the ability to understand written sentences and paragraphs. This ability involves understanding individual words as well as patterns of words (sentences and phrases) so it involves more than simply having a good vocabulary. It is also the ability to read a sentence or series of sentences and understand the meaning. This ability involves receiving information, not giving it. This ability might be used in reading written material such as a report describing a fire or fire prevention codes.

Techniques: Sample questions 7 and 8 measure the ability of written comprehension. To test written comprehension, you may be given a passage of one or more paragraphs describing either a fire-related incident or a set of firefighting procedures. These passages may be as long as 1/2 page in length and may be followed by one or more questions. The questions will test your understanding of the passage.

For some candidates, these questions may prove to be difficult simply because of the initial amount of information you'll be given. Some of the techniques you can use on these questions already have been discussed as part of the general test-taking strategies.

1. One of the most useful techniques involves **reading the test questions and possible answers before reading the passage** to help you identify and focus on the information that is needed. You may find that you locate the answer to one of the questions before you even finish reading the passage for the first time. If so, answer the question right away. As you go from one sentence or paragraph to the next in the initial passage, you may have to look back at the questions to remind yourself of the specific details for which you are searching.
2. Another extremely useful technique is to **circle important or key words** once you have read the questions related to a passage and know what to focus on. For example, if the questions related to the passage involve a particular person, circle the name of that person when you come to it in the passage so you don't waste time looking back through the passage later.

Also, use your pencil to make the passage easier to understand by placing slash marks between key phrases.

3. These tend to be time-consuming questions that you may not have the chance to read more than once. A third technique is to read for understanding the first time and avoid getting stuck on individual words that you do not understand. Sometimes you can tell the meaning of a word from the phrases or ideas that surround it or you may not need to understand the word at all to understand the passage. We warn you, however, do not try to read faster than you can read with comprehension.
4. Try to form a picture in your mind as you read. Books used to teach reading contain many pictures because pictures aid in comprehension.
5. Ask yourself questions as you read. When you finish reading a paragraph or a long sentence, ask yourself what the paragraph was saying. What was the point of the sentence?

It's important to note that most of the suggested strategies for written comprehension questions are meant to help candidates understand the relatively lengthy passages of information that tend to come before these questions. Thus, these strategies would be useful with any kind of question that requires candidates to read and understand a large amount of information.

**Examples:** Use the following passage to answer sample questions 7 and 8:

When there is a fire in a subway train, it may be necessary for firefighters to evacuate people from the train by way of the tunnel. In every tunnel, there are emergency exit areas that have stairways that can be used to evacuate people to the street from the track area. All emergency exits can be recognized by an exit sign near a group of five white lights.

There is a blue light area that is located every 600 feet in the tunnel. These areas contain a power removal box, a telephone and a fire extinguisher. Removal of power from the third rail is the first step firefighters must take when evacuating people through tunnels. When a firefighter uses the power removal box to turn off electrical power during evacuation procedures, the firefighter immediately must telephone the trainmaster and explain the reason for the power removal. Communication between the firefighter and the trainmaster is essential. If the trainmaster does not receive a phone call within four minutes after power removal, the power will be restored to the third rail.

7. When evacuating passengers through the subway tunnel, firefighters must first:
  - A. telephone the trainmaster for assistance.
  - B. remove electrical power from the third rail.
  - C. locate the emergency exit in the tunnel.
  - D. go to the group of five white lights.
8. Immediately after using the power removal box to turn off the electrical power, a firefighter should:
  - A. wait four minutes before calling the trainmaster.
  - B. begin evacuating passengers through the tunnel.
  - C. call the trainmaster and explain why the power was turned off.
  - D. touch the third rail to see if the electrical power has been turned off.

Answers and Explanations: As suggested above, candidates should review the questions related to each written comprehension passage before reading the passage itself. They should then circle/underline key words and phrases in the passage that relate to the questions.

7. B. is the correct answer. The answer can be found by reviewing what the passage said. "Removal of the power from the third rail is the first step firefighters must take when evacuating people through tunnels."

Telephoning the trainmaster for assistance, is done immediately after the power is removed. This makes A incorrect.

The passage only described how to recognize the location of an exit in a subway tunnel it did not say that locating it was the first step. This makes C incorrect.

Once again, answer D is leading you to find the exit as the first thing that a firefighter should do. This makes choice D incorrect.

8. The correct answer is C. The key to this answer can be found in the section of the passage that starts with, "When a firefighter uses the power removal box..." and continues to the part that states and explains the reason for the power removal. This part of the passage reveals the next step that should be taken immediately after using the power removal box.

A and D are incorrect. There is no part of the passage that mentions a waiting period or touching the third rail.

B is incorrect. The passage stated that if the trainmaster was not notified within four minutes after power removal, the power will be restored to the third track. This will put the passengers being evacuated through the tunnel in danger of being electrocuted by the third rail when the trainmaster restores the power.

## **E. Written Expression**

Definition: This ability involves using English words or sentences in writing so that others will understand. These other people might be other firefighters, fire officers, witnesses, arson suspects, fire victims or any individuals with whom the firefighter might come in contact. This ability would include vocabulary, knowledge of differences among words, and knowledge of grammar and the way words are ordered.

Techniques: There are two kind of written expression questions that you may see on the exam.

Type 1: The first type of question (see sample question 9) requires that you identify the best way to communicate a particular thought or idea to another individual. For questions such as these, it is important to ensure that the alternative you choose (a) correctly reflects the meaning of the original idea, and (b) expresses the original idea in the most clear and concise manner.

Type 2: The second kind of written expression question (see sample question 10) requires that you arrange your thoughts or statements in a logical order so that others will understand you. Such questions start with a list of statements to be made by an individual, in writing. For example, the statements may be descriptions of several events that occurred in order at an emergency scene. However, these statements will not be presented to you in the correct order. The response alternatives will present you with several possible ways to order or arrange the statements, only one of which makes sense.

When working with a question such as number 10, look at the content of each statement or phrase separately and determine whether it can stand alone or it must come before or after another statement. If it can't stand alone, look for the statement that must come before or after it. Ask the questions, what happened first and what happened next? In addition, consider whether there are statements that the statement under consideration cannot come before or after. This also will help to narrow down the choices.

Once you have made some decisions about the order of the statements, work through each of the alternatives one by one, keeping in mind the statements that must (or cannot) appear together. Do not try to determine the correct order of all of the statements before looking at the alternatives provided. The reason for this is that there may be several logical ways in which to arrange the statements. However, only one logical order will be included among the alternatives presented.

Examples:

9. While operating at a fire, Captain Green the commander of Ladder Company 999, was sent by Chief Brown to locate the exact location of the fire. The fire building was two stories in height with a basement. Captain Green found that the fire was located in one corner at the rear of the basement. The best way for Captain Green to write this information in a fire report upon returning to the firehouse is as follow:
- A. "The fire was located on the lower level, in the rear."
  - B. "The fire was located in the southeast corner of the lower level."
  - C. "The fire was located in the southeast corner of the basement."
  - D. "The fire was located in the rear of the basement."
10. Firefighter Rogers would like to include the following statements in a report about a recent explosion: (These statements are NOT listed in the correct order.)
- 1 ) I quickly treated the pedestrian for the injury.
  - 2) The explosion caused a glass window in an office building to shatter.
  - 3) After the pedestrian was treated, a call was placed to the Police Department to ask for help in evacuating the area.
  - 4) After all the glass settled to the ground, I saw a pedestrian who was bleeding from the arm.
  - 5) While returning to the firehouse, I heard a loud explosion.

Firefighter Rogers could communicate the above statements most effectively if he arranges them in his report in the following order.

- A. 2, 5, 4, 1, 3.      C. 5, 2,1, 4, 3.
- B. 5, 2, 4, 3,1.      D. 5, 2, 4, 1, 3.

Answers and Explanations:

8. C is the correct answer. The alternatives differ in two important ways. The first concerns the level of the house on which the fire is located. Alternatives C and D indicate that the fire is in the basement, thus leaving little room for confusion. In contrast, alternatives A and B use the term "lower level." "Lower level" could be interpreted as the basement or as the lowest above-ground level in the house. Since the term lower level is more likely to confuse the reader of the report than the term "basement," responses C and D are better than responses A and B.

Second, the alternatives differ in the detail used to describe the area of the basement in which the fire is located. Alternatives B and C use more detail by stating, "In the southeast comer. " This detail allows us to break the basement up into four sections and gives us a very specific idea of where the fire is located. In contrast, alternatives A and D use, "in the rear. "This allows us to break the basement up into only two sections front and rear and gives us a less specific idea of where the fire is located.

Combining the above two ideas, C is the best answer.

10. D is the correct answer for the following reasons:

Statement 5 must come first because it introduces the incident or topic (the explosion) on which all other statements are based. This allows us to eliminate alternative A.

Statement 3 must follow statement 1 because 1 discusses the treatment of the injured pedestrian and 3 discusses what happened after the pedestrian was treated. This allows us to eliminate alternative B.

Statement 4 must follow statement 2 since 2 discusses the shattering of the glass window in the office building and 4 discusses what happened after the glass settled to the ground. However, this information does not allow us to eliminate any alternatives.

Both statements 1 and 3 must follow statements 2 and 4. This is the case because statements 2 and 4 indicate that the injured pedestrian was not discovered until after the shattered glass settled to the ground, while statements 1 and 3 discuss the treatment of the pedestrian and the events that followed this treatment. This allows us to eliminate the only remaining alternative C. The only alternative left is D.

### **F. Information Ordering**

Definition: This is the ability to follow a rule or a set of rules or actions in a certain order. In order to use this ability, an individual must have rules or instructions regarding the correct order of information. For example, in a first-aid situation, the person must first be given a set of instructions concerning what should be done first, second and so on. This ability would also come into play when determining what information must be considered before making a decision or taking a particular action. For example, if placing additional vehicles or equipment at a fire scene would block the flow of traffic, fire personnel should weigh traffic back-up against alternative firefighting procedures before taking any action

Techniques: You may come across Information ordering questions on the exam. Usually, it starts off with the relevant rules, procedures or other items of information.

Example: In an information ordering question (see sample questions 11 & 12), the initial passage presents the procedures in the order in which they must be performed. Candidates then are given a specific set of events and asked to identify the next step that must be followed (based on the order indicated in the initial passage). Such questions require you to closely review the order of the procedures presented in the initial passage.

11. When a fire truck breaks down, the driver of the truck first should notify the dispatcher of the location and assignment of the truck, the nature of the trouble and the help needed. If possible, the firefighters should fix the problem themselves. The driver should notify the dispatcher again when the truck is returned to service. The firefighters then should continue with the assignment unless the dispatcher provides other instructions. Upon return to the station, the driver should make the proper entry in the log.

Consider the following situation:

A driver of a fire truck has just fixed a small problem with his truck while on an assignment away from the station. According to the procedures described above, the next thing the driver or firefighters should do is:

- A. Contact the station officer, report the trouble and the truck repair and wait for further orders.
- B. Continue on with the work and finish the job as assigned.
- C. Notify Fire Maintenance that the problem has been fixed.
- D. Notify the Dispatcher that the truck has been resumed to service.

12. Firefighters often are required to remove people who are trapped in elevators. At this kind of emergency, firefighters perform the following steps in the order given:

- 1. Upon entering the building, determine the location of the elevator involved.
- 2. Reassure the trapped occupants that the Fire Department is on the scene and that firefighters are attempting to free them.
- 3. Determine if there are any injured people in the elevator.
- 4. Determine if the door from the hallway into the elevator shaft is closed.
- 5. If all the doors are closed, call the elevator mechanic.
- 6. Wait until a trained elevator mechanic arrives before attempting to remove any trapped people from the elevator, unless they can be removed through the door to the hallway. However, firefighters must remove the trapped people by any safe method if any one of the following conditions exists:
  - A. There is a fire in the building.
  - B. Someone in the elevator is injured.
  - C. The people trapped in the elevator are in a state of panic.

Firefighters are called to an elevator emergency at a factory building. The freight elevator has stopped suddenly between the third and fourth floors. The sudden stop caused heavy boxes to fall on the elevator operator, breaking his arm. Upon arrival, the firefighters determine the location of the elevator. They tell the trapped operator that they are on the scene, are aware of his injury and are attempting to free him. They determine that all the hallway doors leading into the elevator shaft are closed. The firefighters' next step should be to:

- A. call for an ambulance and wait until it arrives.
- B. remove the trapped person through the door to the hallway.
- C. call for an elevator mechanic.
- D. remove the trapped person by any safe method.

## **ANSWERS AND EXPLANATIONS:**

11. The correct answer is D. When answering this question, candidates are encouraged to use slash marks to break up the paragraph into the specific steps that must be followed by a driver (or the firefighters) when a truck breaks down. The steps are listed below:

1. Notify the dispatcher of the location and assignment of the truck, nature of the trouble and help needed.
2. Fix the problem, if possible.
3. Notify the dispatcher when the truck is resumed to service.
4. Continue with the assignment unless the dispatcher provides other instructions.
5. Upon returning to the station, make the proper entry in the log.

The situation indicates that the driver is at step 2 of the procedure because he/she has just fixed a small problem with the truck while on an assignment away from the station. The candidate is asked to indicate what should be done next. Therefore, the driver must proceed to step 3 and “notify the dispatcher that the truck has been resumed to service”.

A is incorrect because the procedure clearly indicates that the dispatcher, not the station officer, is to be contacted and that the firefighters are to continue with the assignment unless they are given other instructions.

B is incorrect because the procedure clearly indicates that the dispatcher is to be notified that the truck has been resumed to service before the firefighters continue on with the assignment.

C is incorrect because the procedure clearly indicates that the dispatcher, not Fire Maintenance, is to be notified of the truck's return to service.

12. The correct answer is C. (Steps 1-4 were satisfied so the next step will be to call for an elevator mechanic.)

- A. Is incorrect. There is no mention of calling for an ambulance in the instructions
- B. Is incorrect. It was stated that all the hallway doors leading into the elevators were closed.
- D. Is incorrect. Under these circumstances, this would be the next step that follows calling  
for the elevator mechanic.

## **G. Problem Sensitivity**

**Definition:** This is the ability to tell when something is wrong or is likely to go wrong. It involves both recognizing the problem, as a whole, and recognizing the parts of the problem. This ability does not include the ability to solve the problem, only the ability to identify or recognize the problem. Examples of this ability might be deciding that additional traffic control personnel are needed at a fire scene or that the crowd that has been gathering at the fire scene is in danger. Another example might be determining that there is friction among the firefighters within the station house. This ability does not involve the solution to a problem, only the identification of the problem.

**Techniques:** Sample questions 13 and 14 measure the ability of problem sensitivity. Problem sensitivity questions often will begin with the presentation of some rules, procedures or recommended practices, followed by the description of an incident or situation in which these rules should be applied.

13. According to the New York City Fire Department rules, firefighters will NOT make comments to the press or make notification to the relatives of a firefighter who is killed or injured while on duty without the permission of the fire officer in charge.

Consider the following situation: Firefighter Brown of Engine Company 111 sustained a serious injury while operating at a fire. Upon returning to the fire house, FF. O'Neil received a call from FF Brown's wife, asking to speak to FF Brown, FF O'Neil informed her that FF Brown was at the hospital because he got injured while fighting a fire. FF O'Neil's action was:

- A. Proper, because FF Brown wife asked for him.
  - B. Proper, because the next of kin always should be notified as soon as possible in cases of serious injury.
  - C. Improper, because FF O'Neil did not have the authority to make such a notification.
  - D. Improper, because this kind of notification should be done in person.
14. Firefighters are required to use portable ladders to rescue people. When firefighters are positioning a metal portable ladder for a rescue, which one of the following would present the greater threat to the firefighters' safety?
- A. A person to be rescued who is standing near an open window.
  - B. Tree branches that are close to the ladder.
  - C. A person to be rescued who is dressed in a long robe.
  - D. Overhead electrical wires that are close to the ladder.

Answers and Explanations:

13. C is the correct answer. The rule clearly specifies that firefighters must not inform the relatives of an injured firefighter without the approval of his or her officer in charge.

A is incorrect because he should have referred the call to the officer.

B & D are incorrect because the firefighter does not have the authority to make notification without permission.

14. D is the correct answer. Overhead electrical wires in proximity to a portable ladders will present the greater degree of danger because portable ladders used by the Fire Department are made of metal.

## **H. Deductive Reasoning**

**Definition:** This is the ability to apply general rules to specific problems to come up with a logical answer. That is, this ability involves applying general rules or regulations to specific cases or proceeding from stated principles to logical conclusions. Rules and procedures are meant to ensure that firefighters make the correct decisions and take the correct actions in all kinds of situations. An example might be deciding when to use each different kind of fire extinguishing solution such as foam, wetting agents, fog patterns, etc. Another example might be determining whether a fire is controllable or dangerous, or whether a building is at risk of catching fire or collapsing. Rules and procedures also are meant to ensure that fire personnel can coordinate with personnel from other agencies such as the Police Department, hospitals, etc.

**Note:** This ability should not be confused with inductive reasoning, which involves finding a general rule or principle that fits a situation or series of events (going from specific to general).

**Techniques:** For the most part, deductive reasoning questions start with some general rules and procedures and may require the candidate to apply the general rules to specific cases. There are two kinds of deductive reasoning questions.

**Type 1:** The first kind of question involves the application of a verbal rule or principle or (as shown in sample question 15), the application of a mathematical rule presented in the form of a table.

**Type 2:** The second kind of deductive reasoning question involves assigning a specific case to one of several given categories (see sample question 16).

There are four elements to pay attention to when answering questions involving general rules & procedures:

1. Pay attention to the definite order in which steps are taken. Make sure the correct answer uses that same order of steps.
2. Pay attention to when a rule or procedure is in effect. Some rules apply only to certain kinds of situations or certain periods of time. Make sure the correct answer applies to the situation and time in question.
3. Pay close attention to exceptions to the rules. Underline key words such as except, unless, if and only.
4. Pay attention to completeness. If a procedure requires that a firefighter do several things, make sure the correct answer allows for all of those things to be done.

Examples:

Type 1:

15. A large margin of safety should be allowed when choosing the size of rope to use for a given task. As an example: If a rope is to be used to lift a load of 410 pounds, one should not choose a rope with a breaking limit of 410 pounds. Rather, one should choose a rope with about seven times the breaking limit of the load to be lifted that is, with a breaking limit of 2870 pounds. The table below lists the maximum load that can be lifted and the breaking limits for several sizes of rope:

<u>Diameter of rope (in inches)</u>	<u>Maximum load that can be lifted (in lbs.)</u>	<u>Breaking limit (in lbs.)</u>
1/4	55 x 7	385
3/8	130 x 7	910
1/2	230 x 7	1610
3/4	520 x 7	3640
1 inch	925 x 7	6475

According to the information presented above, if a load to be lifted weighs 380 pounds, the size of the rope that should be used to lift this load is:

- A. 1/4 inch in diameter.
  - B. 3/8 inch in diameter.
  - C. 1/2 inch in diameter.
  - D. 3/4 inch in diameter.
16. Incidents involving airplanes and/or airport facilities are classified into the following three categories:

CLASS I: A fire involving airport facilities but NOT involving any airplanes.

CLASS II: A crash and/or fire involving airplanes only (NO buildings or other structures).

CLASS III: A crash and/or fire involving a building or other structure in addition to an airplane.

Consider the following situation:

A private, twin-engine plane crashed into an airport hangar when it tried to land at a small airport in strong winds. When Fire Department personnel arrived, they began immediate rescue and firefighting efforts because the small airport was not equipped to deal with such incidents. The *most* accurate classification for this incident is:

- A. Class I incident.
- B. Class II incident.
- C. Class III incident.
- D. All of the above.

**Answers and Explanations:** As noted earlier, these questions often start off with some general rules and procedures and require the candidate to apply the general rules to specific situations.

15. The correct answer is D. The key phrase is “load to be lifted.” The information in the table indicates that the maximum load that can be lifted by a 1/2-inch rope is 230 pounds. Thus, it is necessary to move up to the next size of rope (3/4 inch) to lift a load of 380 pounds. Since a 3/4-inch rope can lift a maximum load of 520 pounds, such a rope could safely be used to lift a 380-pound load.

Candidates may have chosen alternative A (1/4 inch) if they were confusing the breaking limit with the load to be lifted. However, the paragraph above the table clearly states that “one should choose a rope with about seven times the breaking limit of the load to be lifted”. Therefore, if candidates used the breaking limit to determine the size of rope needed to lift a load of 380 pounds, they would have been looking for a breaking limit of  $380 \times 7$  or 2660 pounds and still should have chosen alternative D.

16. The key to question 16 is to determine how the classes of incidents differ review the particular incident presented in the question with regard to these differences, and then identify the class that matches the particular incident with regard to these differences. The major way in, which the classes differ, involves:

A. the kind of objects involved in the incident (building or other structures only, airplanes only, or both).

Class I: An airport facilities only (no airplanes).

Class II: Airplanes only (no buildings or other structures).

Class III: Airplanes and buildings or other structures.

The correct answer is C. The incident involved an airplane and airport facilities (a hangar). Class III is the only classification that applies to incidents involving airplanes and buildings or other structures. Class I only involves airport facilities and Class II only involves airplanes.

# **I. Inductive Reasoning**

**Definition:** This is the ability to combine separate pieces of information or specific answers to problems to form general rules or conclusions. An example of this might be determining where or how a fire started. Another example could be identifying a particular problem with the performance of a group of firefighters, after having a chance to watch them at several fires. Additionally this ability involves understanding how a series of events might be connected. An example of this might be discovering that the same company owns all of the buildings found to be in violation of a specific fire code.

Note: This ability should not be confused with deductive reasoning, which involves applying general rules or regulations to specific cases (going from general to specific).

**Techniques:** Sample questions 17 and 18 measure the ability of inductive reasoning. Most of the questions for inductive reasoning may start with a passage that give you all of the information you will need to answer the question. More specifically, there are two kinds of inductive reasoning questions that you may come across on the exam:

Type 1: The first kind of question (see sample question 17) will require you to identify a general principle based on specific examples.

Type 2: The second kind of inductive reasoning question (see sample question 18) will require you to notice something similar about a series of events or objects. In order to do this, you have to be able to identify the details that are important to answering the question.

When answering both kinds of questions, skim through the passage to get an idea of what it's about and then read the questions. For type 2 questions, identify key information in each of the events or objects described in the passage (by using your pencil to underline or circle this information) and compare this key information point by point.

## **Examples:**

### Type 1:

17. The table below indicates the number of people needed to carry ladders of different lengths.

<u>Ladder length</u>	<u>No. of people needed to carry the ladder</u>
15 feet	1
25 feet	2
35 feet	3
45 feet	4

According to the information presented in the above table, the following statement most accurately describes the relationship between the length of a ladder and the number of people needed to carry that ladder:

- A. As the ladder length is increased by 10 feet, the number of people needed to carry it is doubled.
- B. As the ladder length is increased by 10 feet, the number of people needed to carry it is tripled.
- C. The longer the ladder, the fewer the number of people needed to carry it.
- D. The longer the ladder, the greater the number of people needed to carry it.

Type 2:

18. The maintenance log for a fire truck shows the following entries:

Daily Maintenance Log

Date 11/17	Date 11/18	Date 11/19
Added 5 gallons gas	Added 1 quart oil	Brake fluid added
Brakes squeaked while responding to fire	Turn signal light replaced	Added air to right back tire
Windshield wiper blade replaced	Brakes locked up during run	Rotated hose (5-inch)
Signed Jones	Signed Smith	Signed Peters

Based on the above information, the driver of this fire truck should tell the supervisor that the:

- A. electrical system should be checked.
- B. brakes should be checked.
- C. engine should be checked.
- D. tires may need to be replaced.

Answers and Explanations:

17. The correct answer is D. Given the information in the table, D contains the only correct statement: the longer the ladder, the more people needed to carry it.

A is incorrect. The table indicates that it takes one person to carry a 15-Foot ladder. The table shows the number of people doubling only when going from a 15-to a 25-foot ladder, because it goes from one to two. With every additional 10 feet, the number of people needed to carry the ladder only increases by one. If the number of people needed to carry a ladder continued to double as the ladder length increased by 10 feet, the number of people needed to carry a 35-foot ladder would be four, and the number of people needed to carry a 45-foot ladder would be eight.

B is incorrect. Again, the table indicates that it takes one person to carry a 15-foot ladder. If the number of people needed to carry a ladder tripled as the ladder length increased by 10 feet, the numbers of people needed to carry a 25-35-and 45-foot ladder would be three, nine, and 27, respectively.

C is not correct because the description of the relationship between the length of the ladder and the number of people needed to carry the ladder is reversed incorrectly.

18. The correct answer is B. In answering this question, you should look for a pattern across the three days that suggests a problem with one of the things mentioned in the alternatives (the electrical system, the brakes, the engine or the tires). In other words, you should compare the information listed for the three days and look for some problem that is repeated in one form or another on all three days. There is an incident involving the brakes on each of the three days. Together, these incidents suggest that the brakes should be checked.

A is incorrect because there is no real indication of an electrical problem. Although the windshield wiper blade was replaced on 11/17, the incident only involved the blade, not the electrical mechanism that operates the wipers. Additionally, although the 11/18 incident involving the turn signal light could have been caused by an electrical problem, it also could have been caused by a burnt-out light bulb that simply needed to be replaced.

C is incorrect because there is no incident involving the engine on any of the three days.

D is incorrect because there was only one incident involving one run on 11/19 (the right back tire needed air). There is no indication that the right back tire (or any other tire) needs to be replaced.

# **PRACTICE EXAM**

## **A. Practice Exam Instructions**

The next part of the Study Guide contains a practice test consisting of 30 questions that may be very similar to the questions that will appear on the actual exam. It will be good practice for you to take this practice exam just as if you were taking the actual examination. You should read and study the entire Study Guide before you begin.

Note that although all items related to each ability area were presented together in the Ability Area section of the guide, the items for each area are mixed up throughout this practice exam. The reason for this is because items also will be mixed up throughout the actual exam. This means that applying the suggested test-taking strategies for each ability area will involve a two-step process. First, you will need to determine what kind of item you are dealing with. Then, you will need to remember what strategies apply to that kind of item. That is why it's important that you become very familiar with the strategies suggested in the Ability Area section of this guide. Of course, some strategies apply to all or almost all items.

Use the blank answer sheet on p. 36 to record your answers to the practice exam. After you have finished this practice exam, compare your answers to those contained in the Answer/Explanations, which follow this practice exam (see pages 54 to 61) and review the explanations provided. Also, fill in the Practice Exam Error Analysis Form on p. 53. For those questions that you did not answer correctly on your first choice, review the section on Error Analysis and try to determine why you chose incorrect answers.

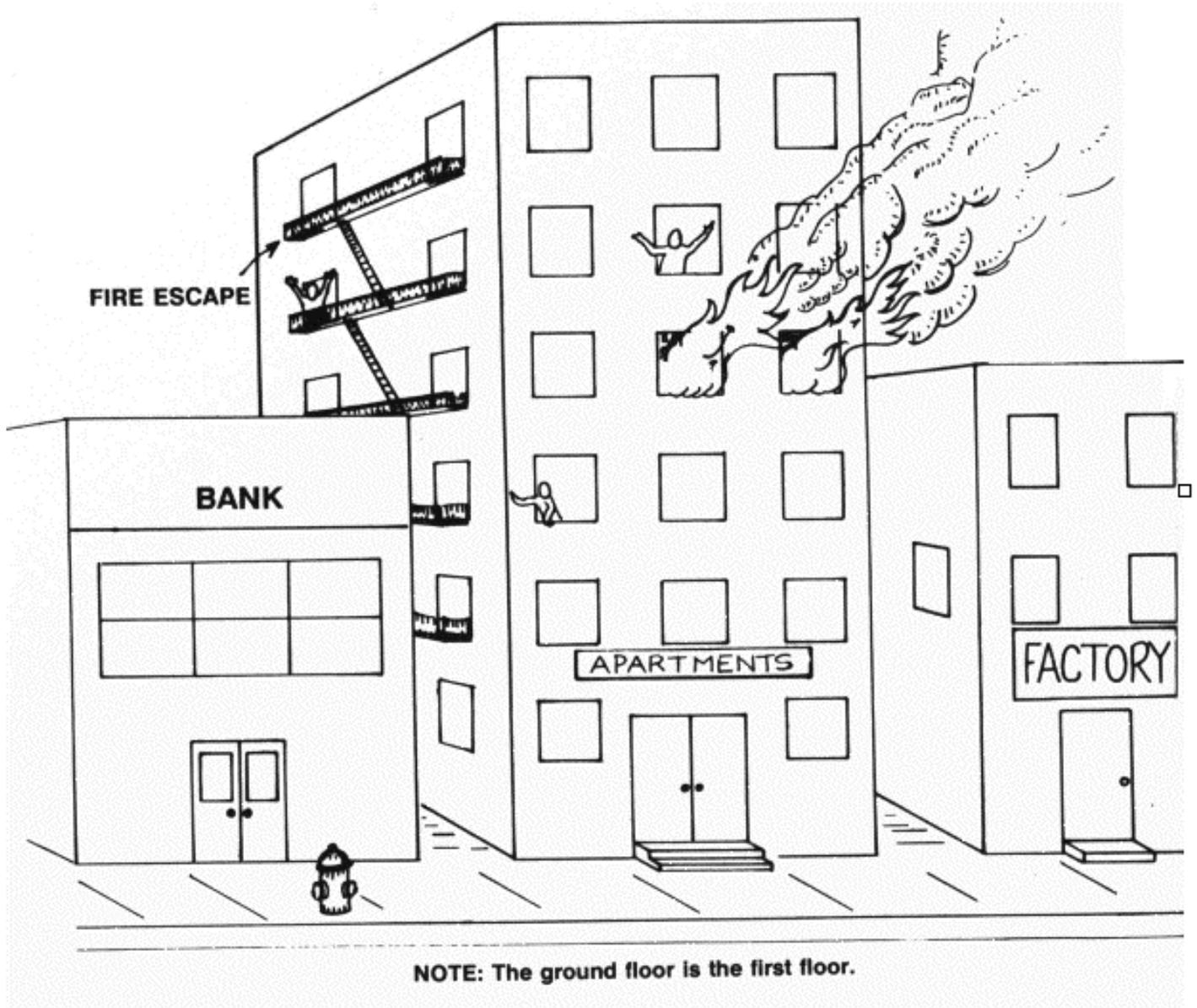
Before you start the practice exam, read the following instructions carefully:

Have a friend or family member time you. On the word "stop," turn to the next page. The memory picture that you must study before beginning the practice exam appears on this page. You will have five minutes to study this picture. On the word "stop," put the picture away and spend the next five minutes thinking about what you just looked at. You should not take any notes or write on the picture during the five-minute study and "hold" periods, but you may use your finger to circle and underline key parts of the picture. After you've spent five minutes studying the picture and five minutes thinking about the picture, begin the exam. On the word "begin," open the Study Guide to page 37 and begin reading and answering the practice exam questions. The first five questions relate to the memory picture you just studied. However, you should not look back at the picture when answering these questions. On the word "stop," close the Study Guide. After you have completed the practice exam, check your answers and analyze your errors using the Answer/Explanations (see pages 54-61) and Error Analysis Form (see page 53).

**DO NOT PROCEED TO THE PRACTICE EXAM Starting ON PAGE 37 UNTIL YOU ARE READY TO TAKE IT.**

**Note: The memory picture used at the actual exam may or may not be about twice the size of the picture on the next page.**

**NOTE:** The picture used at the actual exam may be larger than this one.



## B. Answer Sheet: Practice Exam

Instructions: Use this answer sheet to record your answers to the practice exam. For each question, record your one choice.

Follow the test instructions for candidates. Darken your answers in the ovals below. Do not write anything else on this page. USE NO. 2 SOFT PENCIL ONLY. See instructor for sample question.

WARNING: Be sure that the oval you darken under each choice corresponds to the question you are answering. BE SURE YOUR PENCIL MARKS ARE HEAVY AND BLACK. ERASE COMPLETELY ANY ANSWER YOU WISH TO CHANGE. DO NOT make stray pencil dots dashes or marks ANYPLACE on this page.

1 ( ) ( ) ( ) ( )	26 ( ) ( ) ( ) ( )	51 ( ) ( ) ( ) ( )	76 ( ) ( ) ( ) ( )
2 ( ) ( ) ( ) ( )	27 ( ) ( ) ( ) ( )	52 ( ) ( ) ( ) ( )	77 ( ) ( ) ( ) ( )
3 ( ) ( ) ( ) ( )	28 ( ) ( ) ( ) ( )	53 ( ) ( ) ( ) ( )	78 ( ) ( ) ( ) ( )
4 ( ) ( ) ( ) ( )	29 ( ) ( ) ( ) ( )	54 ( ) ( ) ( ) ( )	79 ( ) ( ) ( ) ( )
5 ( ) ( ) ( ) ( )	30 ( ) ( ) ( ) ( )	55 ( ) ( ) ( ) ( )	80 ( ) ( ) ( ) ( )
6 ( ) ( ) ( ) ( )	31 ( ) ( ) ( ) ( )	56 ( ) ( ) ( ) ( )	81 ( ) ( ) ( ) ( )
7 ( ) ( ) ( ) ( )	32 ( ) ( ) ( ) ( )	57 ( ) ( ) ( ) ( )	82 ( ) ( ) ( ) ( )
8 ( ) ( ) ( ) ( )	33 ( ) ( ) ( ) ( )	58 ( ) ( ) ( ) ( )	83 ( ) ( ) ( ) ( )
9 ( ) ( ) ( ) ( )	34 ( ) ( ) ( ) ( )	59 ( ) ( ) ( ) ( )	84 ( ) ( ) ( ) ( )
10 ( ) ( ) ( ) ( )	35 ( ) ( ) ( ) ( )	60 ( ) ( ) ( ) ( )	85 ( ) ( ) ( ) ( )
11 ( ) ( ) ( ) ( )	36 ( ) ( ) ( ) ( )	61 ( ) ( ) ( ) ( )	86 ( ) ( ) ( ) ( )
12 ( ) ( ) ( ) ( )	37 ( ) ( ) ( ) ( )	62 ( ) ( ) ( ) ( )	87 ( ) ( ) ( ) ( )
13 ( ) ( ) ( ) ( )	38 ( ) ( ) ( ) ( )	63 ( ) ( ) ( ) ( )	88 ( ) ( ) ( ) ( )
14 ( ) ( ) ( ) ( )	39 ( ) ( ) ( ) ( )	64 ( ) ( ) ( ) ( )	89 ( ) ( ) ( ) ( )
15 ( ) ( ) ( ) ( )	40 ( ) ( ) ( ) ( )	65 ( ) ( ) ( ) ( )	90 ( ) ( ) ( ) ( )
16 ( ) ( ) ( ) ( )	41 ( ) ( ) ( ) ( )	66 ( ) ( ) ( ) ( )	91 ( ) ( ) ( ) ( )
17 ( ) ( ) ( ) ( )	42 ( ) ( ) ( ) ( )	67 ( ) ( ) ( ) ( )	92 ( ) ( ) ( ) ( )
18 ( ) ( ) ( ) ( )	43 ( ) ( ) ( ) ( )	68 ( ) ( ) ( ) ( )	93 ( ) ( ) ( ) ( )
19 ( ) ( ) ( ) ( )	44 ( ) ( ) ( ) ( )	69 ( ) ( ) ( ) ( )	94 ( ) ( ) ( ) ( )
20 ( ) ( ) ( ) ( )	45 ( ) ( ) ( ) ( )	70 ( ) ( ) ( ) ( )	95 ( ) ( ) ( ) ( )
21 ( ) ( ) ( ) ( )	46 ( ) ( ) ( ) ( )	71 ( ) ( ) ( ) ( )	96 ( ) ( ) ( ) ( )
22 ( ) ( ) ( ) ( )	47 ( ) ( ) ( ) ( )	72 ( ) ( ) ( ) ( )	97 ( ) ( ) ( ) ( )
23 ( ) ( ) ( ) ( )	48 ( ) ( ) ( ) ( )	73 ( ) ( ) ( ) ( )	98 ( ) ( ) ( ) ( )
24 ( ) ( ) ( ) ( )	49 ( ) ( ) ( ) ( )	74 ( ) ( ) ( ) ( )	99 ( ) ( ) ( ) ( )
25 ( ) ( ) ( ) ( )	50 ( ) ( ) ( ) ( )	75 ( ) ( ) ( ) ( )	100 ( ) ( ) ( ) ( )

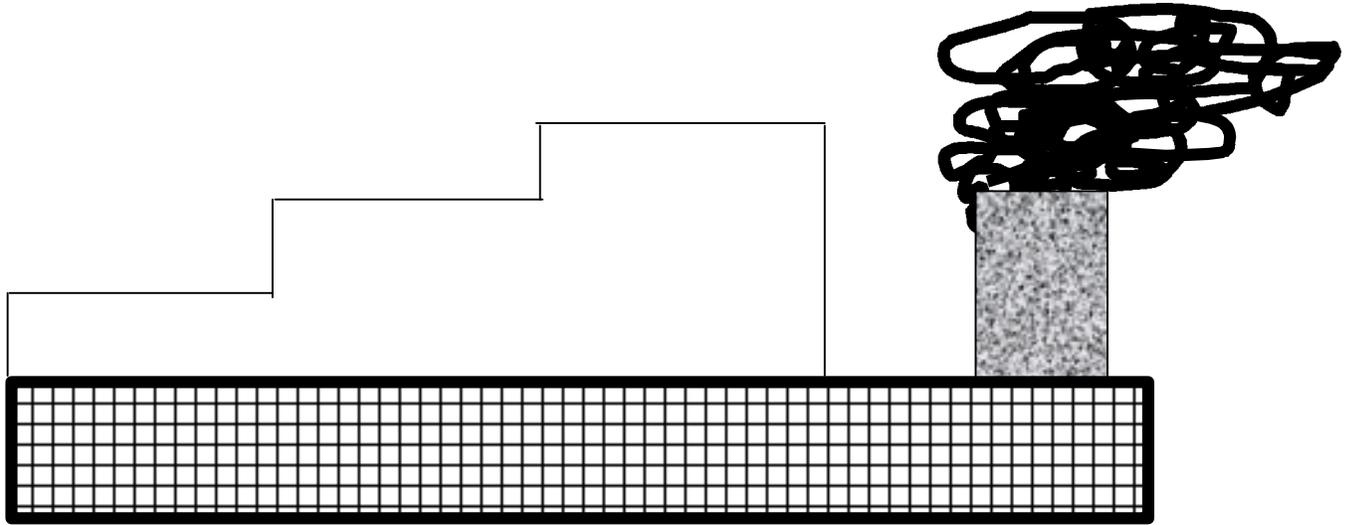
## **C. Practice Exam**

**DO NOT LOOK AT THIS PRACTICE EXAM UNTIL YOU HAVE REVIEWED THE STUDY GUIDE, FOLLOWED THE PRACTICE EXAM INSTRUCTIONS ON PAGE 34 AND ARE READY TO TAKE THE EXAM.**

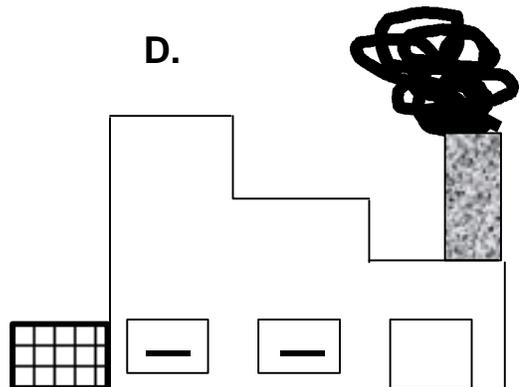
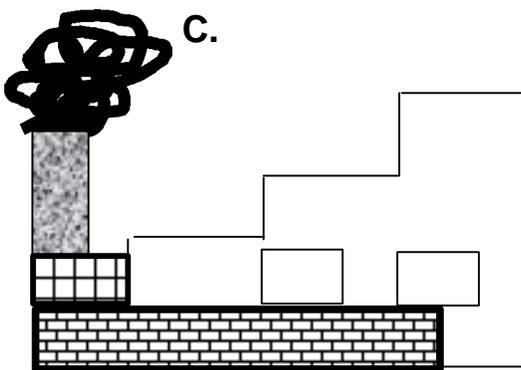
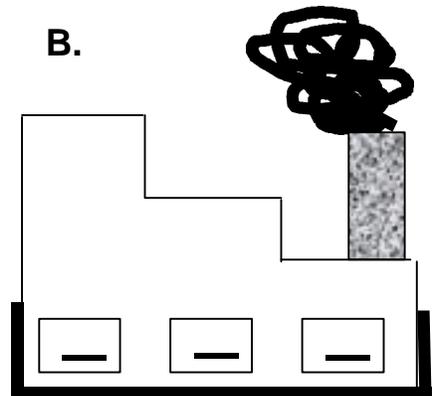
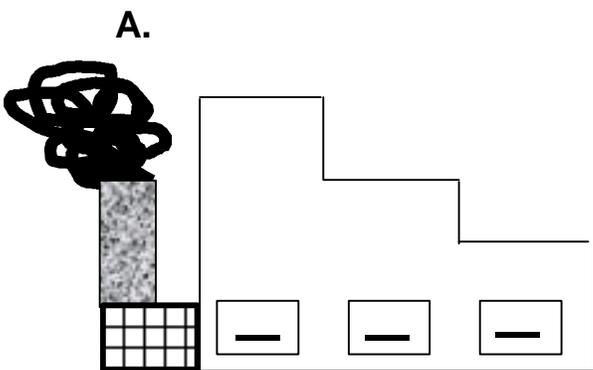
Consider the picture you have just studied when you answer questions 1 through 5, **BUT DO NOT LOOK BACK AT THE PICTURE.**

1. The fire is located on the
  - A. first floor
  - B. fourth floor
  - C. fifth floor
  - D. top floor
  
2. The hydrant on the sidewalk is
  - A. in front of the bank
  - B. between the bank and the apartments
  - C. in front of the apartments
  - D. between the apartments and the factory
  
3. There is a person on a fire escape on the
  - A. second floor
  - B. third floor
  - C. fourth floor
  - D. fifth floor
  
4. People are visible in the windows in the front of the building on fire on the
  - A. second and third floors
  - B. third and fifth floors
  - C. fourth and sixth floors
  - D. fifth and sixth floors
  
5. A firefighter is told to go to the roof of the building on fire. It would be correct to state that the firefighter can cross directly to the roof from
  - A. the roof of the bank
  - B. the roof of the factory
  - C. either the bank or the factory
  - D. neither the bank nor the factory

6. Use the drawing shown below to answer this question.



Shown above is a factory as seen from the front. From the back, this factory would look like:



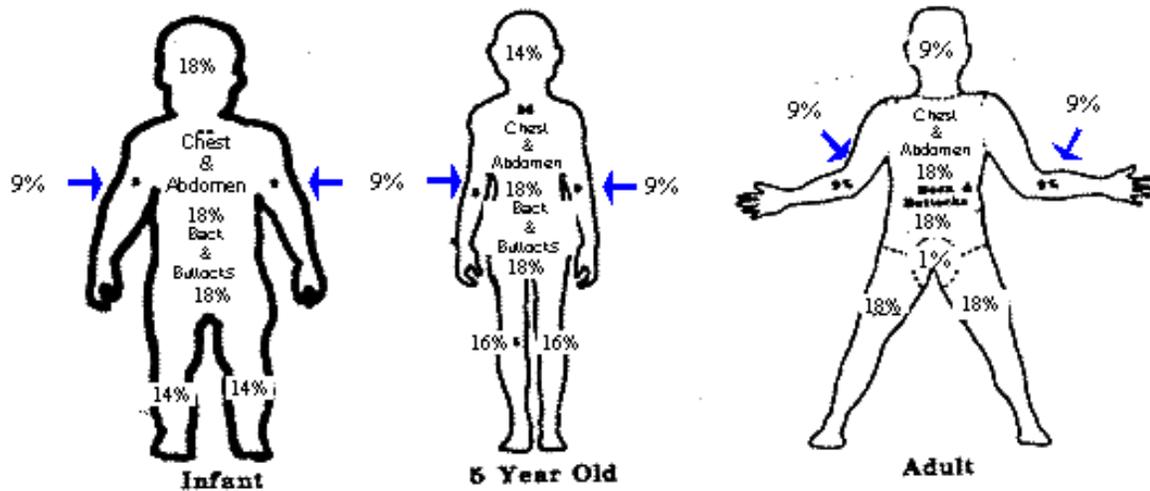
7. Use the information in the following passage to answer questions 7 and 8.

At 2:30 A.M. on Saturday, Engine Companies 7 and 12 responded to a call from Mrs. Farrell, an elderly woman living in Cedarbrook townhouses, apartment number 731. Upon arrival at Mrs. Farrell's home, Lieutenant Decker noticed no flames or smoke, but smelled a strong burning odor. Lieutenant Decker asked Mrs. Farrell how long she had smelled the odor and if there were any other occupants in her apartment. Mrs. Farrell stated the odor woke her up at 2:15 A.M., just before she called the fire department and that she lived alone. Lieutenant Decker sent Firefighters Farber and Fulton to investigate the source of the odor. As soon as they entered the living room, dark smoke began to seep up through the heating grates on the floor, so they went down to the basement to investigate. Lieutenant Decker took Mrs. Farrell to one of the vehicles outside and sent two other firefighters to awaken and evacuate the individuals in the surrounding townhouse apartments. Upon entering the basement, Firefighters Farber and Fulton immediately discovered the source of the fire. Some old wooden furniture had been stored too close to the furnace and had caught fire. Firefighter Farber began to put out the flames with the fire extinguisher he had carried in with him. Firefighter Fulton went outside to get additional help.

7. Mrs. Farrell called the Fire Department because she awoke to:
- A. the sight of flames
  - B. the sight of smoke
  - C. the sound of sparks
  - D. a burning odor
8. The fire in Mrs. Farrell's apartment had started in:
- A. the heating duct that led into the living room
  - B. some old furniture stored in the basement
  - C. Mrs. Farrell's bedroom
  - D. the furnace
9. "There are more engine companies than ladder companies. However, to conclude that the number of firefighters assigned to engine companies exceeds the number of firefighters assigned to hook and ladder companies is to make a basic assumption." Of the following, the most accurate statement of the basic assumption referred to in this quotation is that:
- A. the number of hook and ladder companies does not differ greatly from the number of engine companies
  - B. about the same number of firefighters, on the average, are assigned to each kind of company.
  - C. an engine company, on the average, has fewer firefighters than a hook and ladder company.
  - D. the largest engine company is no larger than the largest hook and ladder company.

Use the information in the following passage to answer questions 10 and 11.

Any firefighter must be able to identify the severity of a victim's burns to ensure that proper medical attention can be given. In order to classify burns, several important factors must be taken into consideration, including the location and extent of the burned surface and the victim's age. These factors are represented in the figures presented below. (All numbers represent percentage of total skin surface.)



Body Burns Expressed in Percentage of Total Skin Surface

Remember to refer back to this figure as you answer questions 10 and 11.

10. A five-year old child was completely burned on both of her legs and her left arm during a fire in her grandparent's home. According to the figures shown above, the percentage of the child's total surface that was burned was about:

- A. 30
- B. 35
- C. 40
- D. 45

Remember to refer back to the figure on the previous page as you answer question 11.

11. Consider the burn victims described below:

- VICTIM 1: an adult male who is burned on his chest and abdomen, back and buttocks and left arm.  
VICTIM 2: an infant girl who is burned on her back and buttocks and both legs.  
VICTIM 3: a middle-aged woman who is burned on her head, back and buttocks and both arms.  
VICTIM 4: A five-year-old boy who is burned on both arms and both legs.

According to the figures shown on the previous page, the victim with the most severe burn (the highest percentage of skin surface damaged) is victim number:

- A. 1  
B. 2  
C. 3  
D. 4
12. Three fires took place near the Bay Housing Project over a three-week period. All three fires are assumed to be the work of arsonists because, in all three cases, a suspect was spotted running from the residence on fire. The description of each suspect is as follows:

Fire #1. (April 8) - male, white, teenager, 5'5", 175 lbs., cap, tattoo on upper left arm, short-sleeve gray shirt, black pants and black shoes.

Fire #2. (April 14) - male, white, teenager, 5'5", 145 lbs., white cowboy hat, large scar directly over eyebrow, short sleeve shirt, blue pants and black shoes.

Fire #3. (April 22) - male, white, teenager, 5'5", 140 lbs., short brown hair, large-sized sunglasses, short sleeve blue shirt, blue jeans and black sneakers.

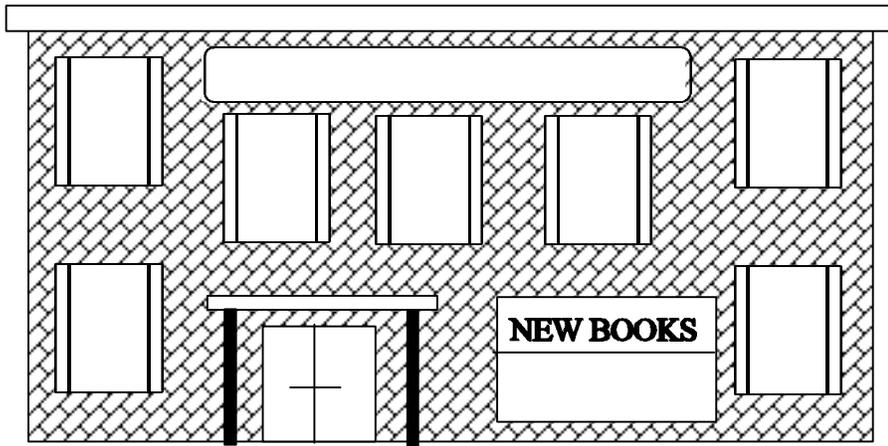
On September 24, a fourth fire occurs near the Bay Housing Project and a suspect spotted once again. The description of the suspect is as follows:

Fire #4. (April 24) - male, white, teenager, 5'5", 143 lbs., short brown hair, large scar directly over eyebrow, short sleeve gray shirt, black pants and black shoes.

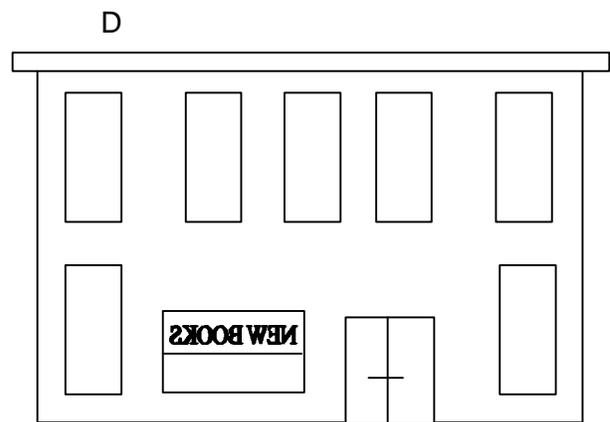
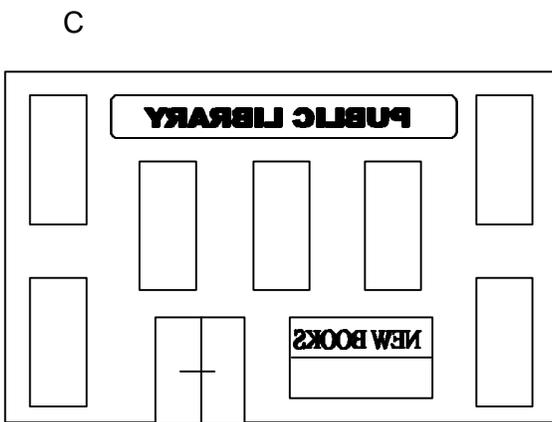
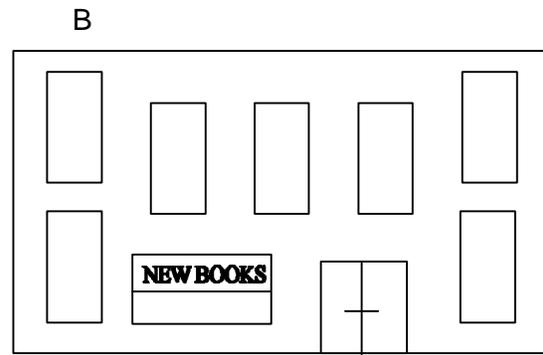
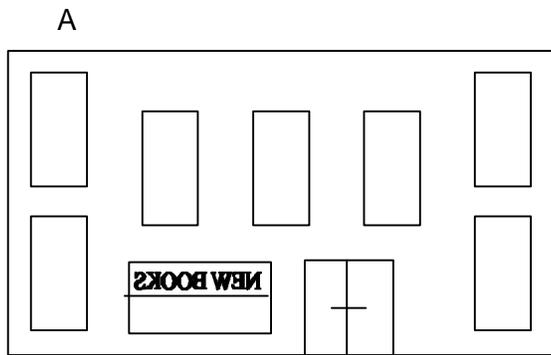
Based upon the description of the suspects in the first three fires, the suspect in Fire #4 should also be considered a suspect in fire numbers:

- A. 2, but not 1 or 3.  
B. 1 and 2, but not 3.  
C. 2 and 3, but not 1.  
D. 2 and 3.

13. Use the drawing shown below to answer this question

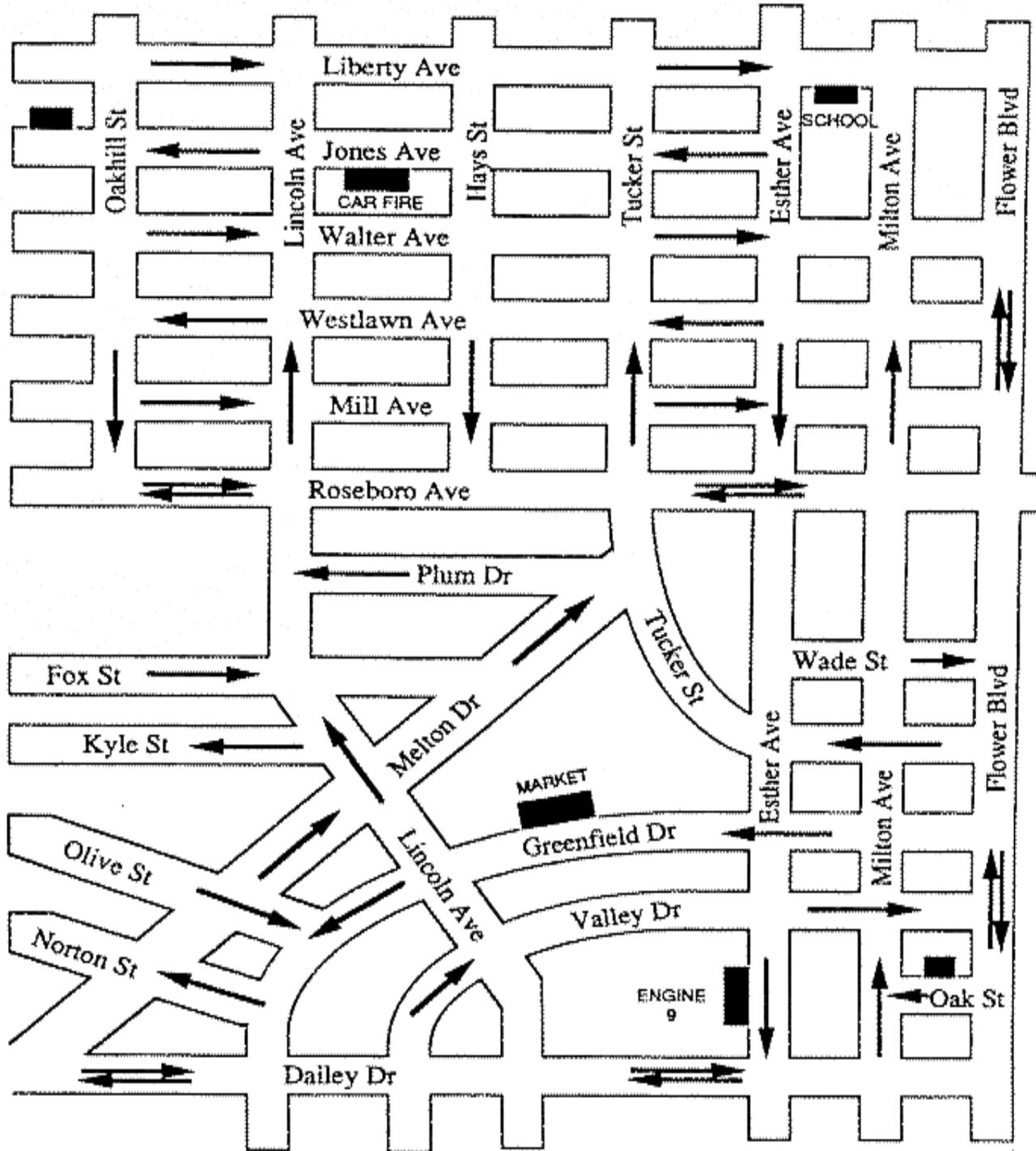
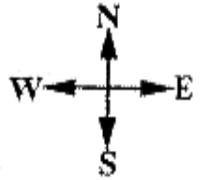


Shown above is the front of a library as seen from the outside. If you were facing the front of this library from the inside, it would look like



Use this map to answer the next 3 questions. The flow of traffic is indicated by the arrows.

- ← Single arrow represents one-way street
- ↔ Double arrow represents two-way street



14. Firefighters at Engine Company 9 are dispatched to respond to a fire at a market on Greenfield Drive (between Lincoln Avenue and Esther Avenue). The most direct route to the fire without breaking any traffic laws is as follows:
- A. Travel north on Esther and west on Greenfield to the fire.
  - B. Travel south on Esther, west on Dailey, northwest on Lincoln, and northeast on Greenfield to the fire.
  - C. Travel south on Esther, east on Dailey, north on Flower, and west on Greenfield to the fire.
  - D. Travel south on Esther, east on Dailey, north on Milton, and west on Greenfield to the fire
15. Firefighters at Engine Company 9 are dispatched to respond to a car fire on Jones Avenue (between Lincoln Avenue and Hays Street). The most direct route to the fire without breaking any traffic laws is as follows:
- and
- A. Travel south on Esther, west on Dailey, northwest and then north on Lincoln, east on Jones to the fire.
- and
- B. Travel south on Esther, west on Dailey, northeast on Melton, north on Tucker, west on Jones to the fire.
- Melton,
- C. Travel south on Esther, west on Dailey, northwest on Lincoln, northeast on north on Tucker, and west on Jones to the fire.
  - D. Travel north on Esther and west on Jones to the fire.
16. Firefighters in Engine Company 9 are returning to the station after putting out a trash fire when they are dispatched to respond to a fire in an apartment building. They were situated at the intersection of Esther Avenue and Valley Drive when they received the call. They were given the following directions to get to the scene of the fire: travel east for 2 blocks, then turn north and travel for 6 blocks, then turn west and travel for 3 blocks, and finally turn north and travel 1 block to the fire. Given these directions, the apartment building on fire must be situated closest to the intersection of:
- A. Hays Street and Walter Avenue.
  - B. Jones Avenue and Esther Avenue.
  - C. Tucker Street and Walter Avenue.
  - D. Esther Avenue and Westlawn Avenue.

17. While inspecting an automobile repair garage, firefighter Morales observed the following conditions:
- A. A mechanic is repairing a hole in a half-filled gas tank while smoking a cigarette.
  - B. A heater is being used to heat the garage.
  - C. A mechanic is changing a tire on a van while smoking a pipe.
  - D. There is no fire extinguishing equipment in the garage.

Of the four conditions observed by firefighter Morales, which is the most dangerous fire hazard?

18. The owner of a building at which you helped put out a fire complained bitterly to you that the firefighters broke a number of cellar windows even before setting out to extinguish the fire in the cellar. Of the following, the best action for you to take is to:
- A. question the validity of the data as described by the owner.
  - B. request the owner to put the statement in writing.
  - C. explain the reason for breaking the windows to the owner of the building.
  - D. suggest that the owner have the cellar windows replaced with unbreakable glass.

Use the information in the following passage to answer question 19:

Some firefighting equipment is listed and defined below:

- 1) Backboard - A sturdy piece of board used to prevent injured victims from moving before they are transported.
- 2) Stretcher - A portable cot on wheels used to transport injured or ill victims.
- 3) Gasoline Circular Saw - a gasoline engine equipped with blades which is used to cut masonry, steel, etc.
- 4) Gasoline Hydraulic Hurst Tool - a tool powered by a hydraulic gasoline engine and connected to a pump by a high-pressure hose. Used to quickly remove steering wheels, doors, etc. on autos in order to free occupants.
- 5) Gasoline Handy-Billy - a pump powered by a gasoline engine that is used to draw water from pools, ponds, etc. to put out fires in remote locations or where no other water is available.
- 6) Oxy-Acetylene Cutting Torch - a device that is used to speed entry (or cut) through steel doors or windows, and in rescue operations involving vehicles, machinery, etc.

19. A gasoline circular saw, gasoline hydraulic hurst tool, and oxy-acetylene cutting torch are similar in that they help firefighters to perform the following function:
- A. remove heat, smoke and fumes from the fire area.
  - B. move victims at the emergency scene.
  - C. force entry into automobiles, buildings, or equipment.
  - D. Supply electricity to equipment used at the emergency scene.

20. In writing a report to Chief Byrnes, Lieutenant Lewis made the following observations when describing the kinds and characteristics of rope used in the Fire Department:
1. Although rope can be made of many different fibers, manila and sisal are two of the more commonly used fibers in the Fire Department.
  2. Though not as strong as manila, the sisal fiber is used more in making ropes of smaller diameter.
  3. Manila rope is made from the fibers of the abaca plant or wild banana plant found in the Philippine Islands.
  4. Sisal fiber is produced from a plant that grows in Yucatan.
  5. Rope is an essential item of fire equipment and is carried on all fire apparatus.
  6. A rope made of these materials has great strength and durability, with a minimum of stretch.

Lieutenant Lewis' observation would be most effective if the above statements were presented in the following order:

- A. 5,1,3,6,4,2.
- B. 1,5,4,6,3,2.
- C. 3,4,5,1,2,6.
- D. 4,3,6,2,1,5.

Use the following passage to answer questions 21 and 22:

It is the standard operating procedure to conduct a primary search in all residences that are on fire or threatened by fire, if the residences can be entered safely. Primary search means firefighters quickly go through all affected areas to ensure the removal or safety of all occupants. Time is the critical factor in the primary search process.

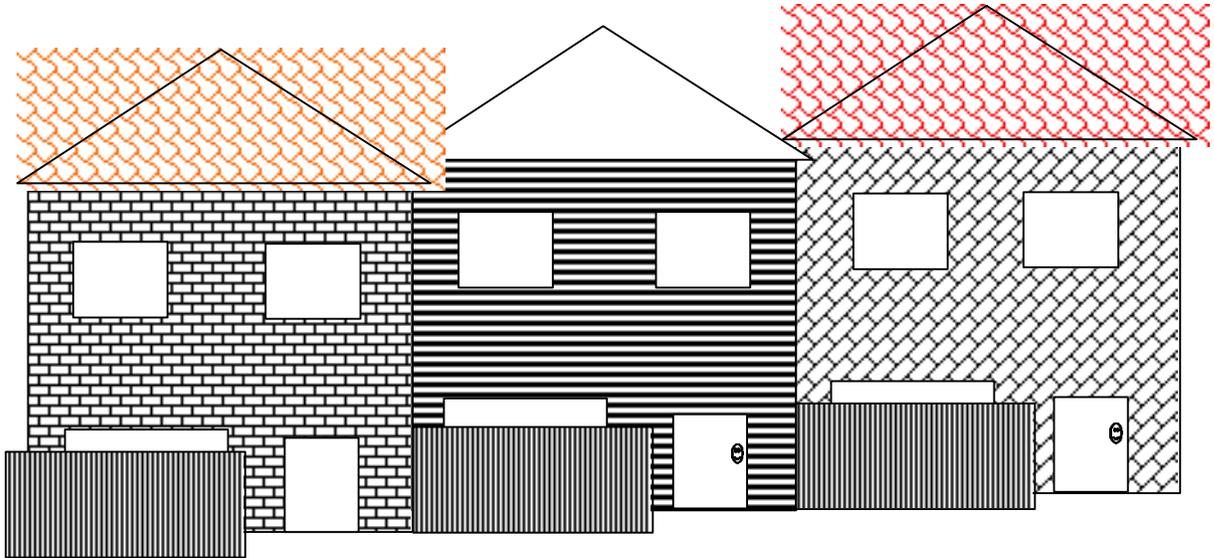
The rescue procedures that are performed after steps have been taken to control the fire are called secondary search procedures. Secondary search means that firefighters thoroughly search the interior of the fire area after initial activities have been conducted to control and ventilate the fire. Thoroughness rather than time is the critical factor in secondary search.

In the case of a very minor fire that clearly poses no hazard to life, a rapid interior search is conducted and "all clear" is reported. In the case where smoke is seen or there is an active fire, efforts to control the fire and rescue occupants are conducted at the same time in order to gain entry into the structure for a primary search. The primary search then is followed by a secondary search. In the case of a building that is completely engulfed in smoke and flames, the survival of occupants becomes unlikely. In this case, as soon as the fire is under control, a secondary search is made for victims.

Firefighters cannot depend on reports from spectators to determine the exact location, number and condition of victims. Rather, such information is used only to support search efforts.

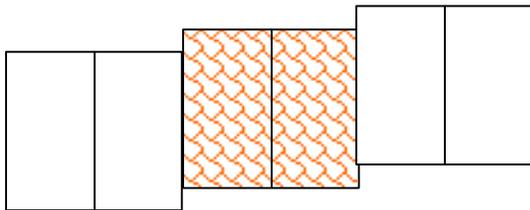
21. In the case of a fire where a whole building is engulfed in flames, the kind of search that should be conducted as soon as the fire is under control is:
- A. a primary search.
  - B. a secondary search.
  - C. a primary search followed by a secondary search.
  - D. no search since the survival of occupants is unlikely.
22. The difference between a primary and secondary search is that:
- A. a primary search is always conducted; a secondary search is not always conducted.
  - B. a secondary search is always conducted; a primary search is not always conducted.
  - C. in a secondary search, time is the most important factor, while in a primary search thoroughness is the most critical factor.
  - D. in a primary search, time is the most important factor, while in a secondary search thoroughness is the most critical factor.

23. Use the drawing shown below to answer this question.

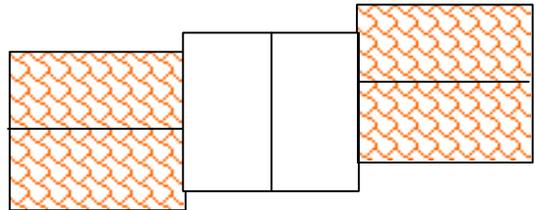


Shown above is the front of a group of townhouses as seen at ground level. If you were situated on a 75-100 ladder above these townhouses, they would look like:

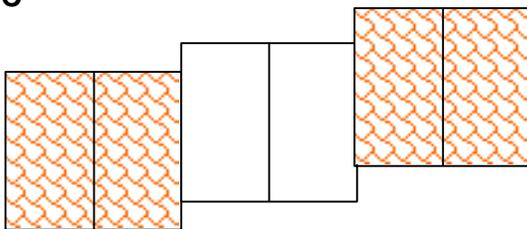
**A**



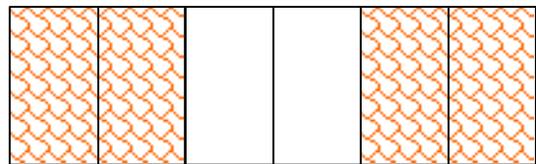
**B**



**C**



**D**



24. During building inspections, the following conditions often are identified as dangers to the safety of the building. Therefore, owners are ordered to remove or correct these conditions:

- A. Defective heating or cooking appliances.
- B. Dangerous pile-ups of rubbish, waste paper, boxes, shavings, or other flammable materials.
- C. Pile-ups of grease in kitchen exhaust ducts.
- D. Obstructions to doors and windows that are likely to interfere with the exiting of occupants in the case of fire.
- E. Overcrowded conditions caused by permitting the maximum occupancy rate to be exceeded.
- F. Designated fire exits that are locked or do not work properly.

Fire Chief Cassidy recently examined the Last Chance Cafe and identified four violations from the list above: B, D, E and F. Coincidentally, the day of the inspection was the last day of the tourist season, so the owner was preparing to close the store and remain closed for four months. Despite the circumstances, the Fire Chief instructed the owner to correct the one problem that still would be serious if not dealt with until the Cafe reopened in four months. Under the circumstances, the most serious problem for the vacant restaurant would be:

- A. violation B.
- B. violation D.
- C. violation E.
- D. violation F.

25. In a memo to all Bureau of Personnel, Chief Jackson wrote the following comments before introducing new regulations regarding firehouse behavior:

1. A major objective of the Division of Fire is to create an atmosphere in the firehouse that is conducive to safe and effective firefighting.
2. Behavior among the firefighters that reflects mutual respect and fellowship is essential to achieving this atmosphere
3. Firefighters' refusal to share meals together leads to a breakdown in the maintenance of internal discipline.
4. Aside from the obvious decline in morale, a breakdown in internal discipline greatly increases the risk of accidents at fires.
5. For this reason, the Division sets forth regulations regarding communal activities (e.g., meals) that take place in the firehouse.

The above comments could be made most effectively if they were presented in the following order:

- A. 5, 1,2,4,3.
- B. 3, 1,4,2,5.
- D. 2,4, 1,5,3.
- E. 1,5,2,4,3.

Use the information in the following passage to answer question 26.

Consider the following information about the hospitals located in Middle County:

HOSPITAL NAME	DISTANCE FROM RENOVA	DISTANCE FROM HATFIELD	DISTANCE FROM HIGHTOWN	ADMITTANCE LIMITATIONS
Alpha	30 min.	65 min.	8 min.	No obstetrics or children (under 18)
Beta	25 min.	45 min.	22 min.	None
Sigma	11 min.	28 min.	51 min.	No children (under 18)

During the past 48 hours, ambulances responded to four calls in Middle County. The table below provides some information about each of these calls, including the hospital to which each patient was taken.

CALL NO.	LOCATION	AGE OF PATIENT	TYPE OF PATIENT	HOSPITAL REQUESTED BY PATIENT	HOSPITAL PATIENT TAKEN TO
1	Hatfield	37	Psychiatric	None	Sigma
2	Hightown	40	General	Beta	Beta
3	Hatfield	6	General	None	Beta
4	Renova	20	Obstetrics	Alpha	Sigma

26. Given the information provided in the above passage, the statement that most accurately reflects Middle County's policy with regard to patients who request specific hospitals must be as follows:
- A. patient requests are ALWAYS honored.
  - B. patient requests are NEVER honored.
  - C. patient requests are honored ONLY if the requested hospital admits such patients.
  - D. patient requests are honored ONLY if the requested hospital happens to be the closest hospital.

Use the information in the following passage to answer questions 27 and 28:

Operations conducted by fire personnel at fire-related incidents include evacuation procedures. Evacuation procedures are designed to remove fire personnel from situations in which their lives are threatened. These procedures are of three kinds:

Type 1: Emergency Evacuation - This kind of evacuation procedure is used in incidents involving such factors as the potential collapse of a structure or hazardous materials. All fire personnel inside the involved building or area will immediately evacuate the involved building or area, leaving all equipment in place.

Type 2: Tactical Withdrawal - This type of evacuation procedure is used when going from an offensive (interior attack), to a defensive (exterior attack) strategy. All fire personnel inside the involved building or area will evacuate the involved building or area with all equipment.

Type 3: Sector Withdrawal - After the use of an Emergency Evacuation or Tactical Withdrawal, all fire personnel shall be outside the involved building or area. However, conditions may be hazardous enough to require complete withdrawal from an entire sector (larger area). If so, this kind of evacuation procedure is used. If possible, fire apparatus (with all personnel aboard) shall immediately leave the sector by a safe route, leaving all equipment behind. Fire apparatus radios then are to be monitored for further orders.

27. Consider the following situation: Firefighters from Engine Companies 1, 2 and 3; Ladder Companies 3 and 8; and Rescue Squad 5 had been fighting a fire at a five-story office building for a half hour. Despite their efforts, the building soon was engulfed in flames and several firefighters were forced to leave the building. Since it was 11 p.m. and there was no indication that civilian lives were threatened, the Commander in charge of the incident ordered all firefighters to evacuate the building with their equipment and to wait for further instructions regarding an external attack on the building. This situation best represents a(n):
- A. Tactical Withdrawal.
  - B. Tactical Withdrawal followed by a Sector Withdrawal.
  - C. Emergency Evacuation.
  - F. Emergency Evacuation followed by a Sector Withdrawal.

Remember to use the passage on the previous page when answering question 28.

28. Consider the following situation. A railroad car carrying toxic chemicals overturned and exploded into flames just outside the town of Melville. Firefighters from Battalion 5 responded to the incident. Upon discovering that the fire was caused by the explosion of toxic chemicals, the Battalion Chief ordered all personnel in the area to evacuate immediately and to leave any equipment in place. Since the incident involved toxic chemicals, the Battalion Chief then ordered all fire apparatus to leave the sector with all personnel. He also took steps to notify residents in the surrounding area of the incident and possible need for evacuation. The Battalion Chief instructed personnel to monitor their radios for further orders. This situation best represents a(n):
- A. Tactical Withdrawal.
  - B. Tactical Withdrawal followed by a Sector Withdrawal.
  - C. Emergency Evacuation.
  - D. Emergency Evacuation followed by a Sector Withdrawal.

Use the information in the following passage to answer questions 29 and 30:

The following procedures are used to put out fireplace fires that get out of control. They are listed in the order in which they must be performed:

- 1) Stretch a canvas cover in front of the fireplace if the fire has not spread to the inside of the room, in order to prevent damage to the room.
  - 2) Use a small hose-line or water fire extinguisher to put out the fire in the fireplace.
  - 3) Find out if the fire has extended to the inside of the walls.
  - 4) Make sure the small hose-line or extinguisher is ready for further use.
  - 5) If fire is inside the walls, ceilings or floors, tear them open.
  - 6) Use the small hose-line or water fire extinguisher to put out any fire found in the walls, ceilings or floors.
29. Firefighters are at the scene of an uncontrolled fireplace fire. They have followed proper procedure and have just found that the fire has extended into the wall. The next thing the firefighters should do is:
- A. tear open the wall with axes.
  - B. put out the fire in the fireplace.
  - C. put out the fire in the wall.
  - D. make sure the necessary equipment is ready for use.
30. Firefighters are at the scene of an uncontrolled fireplace fire. The fire has NOT spread to the inside of the room so a canvas cover has been stretched in front of the fireplace. The next thing the firefighters should do is:
- A. determine if fire has extended into the walls, ceilings or floors.
  - B. *tear open the walls, ceilings and floors.*
  - C. put out the fire in the walls, ceilings and floors.
  - D. put out the fire in the fireplace.

## D. Error Analysis Form: Practice Exam

PRACTICE ABILITY		CORRECT?	INCORRECT ANSWERS						
ITEM NO.	AREA		1	2	3	4	5	6	7
1	MEMORY		—	—	—	—	—	—	—
2	MEMORY		—	—	—	—	—	—	—
3	MEMORY		—	—	—	—	—	—	—
4	MEMORY		—	—	—	—	—	—	—
5	MEMORY		—	—	—	—	—	—	—
6	VISUAL		—	—	—	—	—	—	—
7	WRITTEN C		—	—	—	—	—	—	—
8	WRITTEN C		—	—	—	—	—	—	—
9	WRITTEN E		—	—	—	—	—	—	—
10	DEDUCT		—	—	—	—	—	—	—
11	DEDUCT		—	—	—	—	—	—	—
12	INDUCT		—	—	—	—	—	—	—
13	VISUAL		—	—	—	—	—	—	—
14	SPATIAL		—	—	—	—	—	—	—
15	SPATIAL		—	—	—	—	—	—	—
16	SPATIAL		—	—	—	—	—	—	—
17	PROB		—	—	—	—	—	—	—
18	PROB		—	—	—	—	—	—	—
19	INDUCT		—	—	—	—	—	—	—
20	WRITTEN E		—	—	—	—	—	—	—
21	WRITTEN C		—	—	—	—	—	—	—
22	WRITTEN C		—	—	—	—	—	—	—
23	VISUAL		—	—	—	—	—	—	—
24	PROB		—	—	—	—	—	—	—
25	WRITTEN E		—	—	—	—	—	—	—
26	INDUCT		—	—	—	—	—	—	—
27	DEDUCT		—	—	—	—	—	—	—
28	INF ORD		—	—	—	—	—	—	—
29	INF ORD		—	—	—	—	—	—	—
TOTAL CORRECT:			—	—	—	—	—	—	—
TOTAL FOR EACH TYPE OF ERROR:			—	—	—	—	—	—	—

## E. Practice Exam Answers/Explanations

The answers to the practice exam are listed below. Explanations of the answers follow this list.

1. B	6. A	11. D	16. C	21. B	26. C
2. A	7. D	12. C	17. A	22. D	27. A
3. D.	8. B	13. A	18. C	23. C	28. D
4. B	9. B	14. D	19. C	24. A	29. D
5. D	10. C	15. C	20. A	25. B	30. D

Memory items - 1, 2, 3, 4 and 5. These items are based on the memory picture provided. The answers can be explained by looking back at the memory picture.

### Visualization items - 6, 13 and 23.

6. The correct answer is A. Since the initial object (factory) is to be viewed from the back, attention should be focused on those things that can be seen from both the front and back. This includes the chimney, smoke and the shape (or sections) of the factory. Since the factory is to be viewed from the back, these things should appear in the reverse or opposite position. Things that can't be seen from both the front and back should be ignored, such as any windows and doors on the initial factory or the factories shown in the alternatives.

B is incorrect because the chimney appears in the same position as in the initial factory instead of being reversed as in correct alternative A.

C is incorrect because the main portion of the factory appears in the same position as in the initial factory, rather than being reversed.

D is incorrect because, as in B, the chimney appears in the same position as in the initial factory instead of being reversed.

13. **The correct answer is A.** Since the library is to be viewed from inside, attention should be focused on those things that can be seen from both the outside and the inside. This includes the windows, doors, doorknobs and any lettering that can be assumed to be written on glass. Such lettering should appear in reverse when the library is viewed from the inside. Such things as the roof, the pattern of the back on the outside of the library and the overhang over the front door of the library, should be ignored, since they cannot be seen from inside.

B is incorrect because the words, "New Books" appear in the same position as in the initial library. These words should appear in reverse position, as in correct alternative A.

C is incorrect because the double doors and the window that contains the words "New Books" appear in the same position as in the initial library. Again, these portions of the library should appear in reverse position when being viewed from inside. (See correct alternative A.)

D is incorrect because the windows do not appear in the correct positions. The middle three windows should appear lower down on the front of the library.

23. C is the correct answer. Since the townhouses are to be viewed from above, attention should be focused on those things that can be seen from both the front and above. This includes the rows (lines and design) and the way the townhouses are joined together. The windows and doors should be ignored since they cannot be seen from above.

A is not correct because the design of the rows is wrong. The center roof should have a design and the remaining rows should appear white (see correct alternative C).

B is not correct because the townhouses on the left and right are drawn with horizontal rather than vertical rows

D is not correct because the townhouses are not joined together correctly. The initial picture indicates that the townhouses are staggered in their alignment. Alternative D shows the townhouses as though they were lined up right next to one another.

Spatial Orientation items – 14, 15 and 16.

14. D provides the most direct route to the fire without breaking any traffic laws.

A is incorrect because it suggests the candidate travel in the wrong direction (i.e., north) on Esther.

B is incorrect because it suggests the candidate travel in the wrong direction (i.e., northeast) on Greenfield.

C is incorrect because it suggests a less direct route to the fire than that suggested in the correct answer - D.

15. C provides the most direct route to the fire without breaking any traffic laws.

A is incorrect because it suggests the candidate travel in the wrong direction (i.e., east) on Jones.

B is incorrect because it suggests a less direct route to the fire than that suggested in the correct answer- C.

D is incorrect because it suggests the candidate travel in the wrong direction (i.e., north) on Esther.

15. The correct answer is C, Tucker Street and Walter Avenue.

Written Comprehension items – 7, 8, 21, and 22.

7. D is the correct answer. As stated in the passage, “Mrs. Farrell stated the odor woke her up at 2:15 A.M., just before she called the Fire Department.

Alternative C is incorrect because there was no mention of sparks in the passage.

Alternatives A and B are incorrect. Although smoke and flames may have been seen, they were seen by the firefighters only after they had begun to investigate the source of the odor reported by Mrs. Farrell. The question asked what awoke Mrs. Farrell and caused her to call the Fire Department. As noted above, Mrs. Farrell awoke to an odor just before she called the Fire Department.

8. B is the correct answer. The question asked where the fire started. As stated in the passage, “Firefighters Farber and Fulton immediately discovered the source of the fire. Some old wooden furniture had been stored too close to the furnace and had caught on fire.

A is incorrect. Smoke from the burning furniture did get into the heating duct and travel up through the grates in the living room. However, the duct and grates were simply the first places where smoke from the fire was noticed. The fire did not start in the duct.

C is incorrect because there is no mention of fire or smoke in Mrs. Farrell's bedroom at any point in the passage. However, since Mrs. Farrell awoke to the smell of smoke, some candidates may incorrectly assume that the fire started in Mrs. Farrell's bedroom.

D is incorrect. The wooden furniture caught on fire because it was stored too close to the furnace. However, the fire did not start in the furnace. It started in the furniture.

21. B is the correct answer. The third paragraph of the passage clearly states, “In the case of a building that is completely engulfed in smoke and flames, the survival of occupants becomes unlikely. As soon as the fire is under control, a secondary search is made for victims. This suggests that no primary search is conducted in the case of a building that is completely engulfed because it is unlikely that occupants can be saved. Initial efforts instead should be directed toward controlling the fire, after which a secondary search should be conducted for victims.

A and C are not correct because the portion of the passage quoted above suggests that a primary search is not conducted at any point in time for a building that is completely engulfed in flames.

D is only partially correct. The portion of the passage quoted above suggests that no primary search is conducted because “the survival of occupants is unlikely”. The passage goes on to say that a secondary search should be conducted once the fire is under control. Thus, it is not correct to say that “no search is conducted,” only that “no primary search is conducted”.

22. D is the correct answer. This answer is clearly supported by statements that are made in paragraphs 1 and 2 of the passage: “Time is the critical factor in the primary search process” and “Thoroughness, rather than time, is the critical factor in secondary search.”

The first part of A (i.e., a primary search is always conducted) is clearly incorrect, given the explanation provided for question 21, which indicates that a primary search is not conducted in buildings that are engulfed in flames. There is not enough information in the passage to indicate whether the second part of alternative A (i.e., “A secondary search is not always conducted”) is true.

Although the second part of B (i.e., “a primary search is not always conducted”), may be true, again, there is not enough information in the passage to allow us to evaluate the first part of B (i.e., “a secondary search is always conducted”).

Finally, C incorrectly reverses the purposes of the two kinds of search.

Written Expression items - 9, 20 and 25.

9. B is the correct answer. The assumption is that there are more firefighters assigned to engine companies than to hook and ladder companies, there are more engine companies in the Fire Department than hook and ladder companies, therefore B is the only statement that will bring you to the above conclusion.

C. States that the engine companies have, on average, fewer firefighters than the ladder companies in this situation, it can be possible that there could be more firefighters assigned to hook and ladder companies than engine companies.

A and D do not deal with the number of firefighters; they deal mainly with the size or the number of the engine and hook and ladder companies.

20. The correct answer is A. There are a number of factors that are important to answering this item correctly. The clearest clues involve statement nos. 6 and 2.

Statement no. 6 notes that “rope made of this material has great strength and durability.”

Thus, statement no. 6 must immediately follow a statement that introduces one of the two types of ropes. Since statement no. 2 states “though not as strong as manila, the sisal fiber is used . . .,” statement no. 6 must be referring to manila rope, not sisal rope. Since statement no. 3 introduces manila rope, this must be the statement that should come immediately before statement no. 6. This allows us to rule out alternatives B and C:

Statement no. 2 suggests a few other things. The first is that the sisal fiber should probably be discussed after the manila fiber. The second is that a statement that introduces the sisal fiber (i.e., statement no. 4 or 1) should probably come right before statement no. 2. This allows us to rule out alternatives B and D.

Finally, statement no. 1 should probably come before any statement that discusses the two types of fibers (i.e., statements 2, 3, 4 and 6). This allows us to rule out alternatives C and D.

The only alternative left after incorrect alternatives are eliminated is A

25. The correct answer is B. Since a reference is made to “this atmosphere” statement no. 1 must immediately follow a statement, which discusses the atmosphere in the firehouse. Statement no. 3 is the only statement that does this. The only alternative in which statement no. 1 follows statement no. 3 is B.

Further, statement no. 2 should be presented immediately after statement no. 4 because of the discussion of the “breakdown in internal discipline.” Again, the only alternative where this occurs is B.

Information Ordering Items - 29 and 30.

29. The correct answer is D. The key phrase in this item is “have just found that the fire has extended into the wall..” This represents step 3 in the set of procedures so the next step that must be followed is step 4. Step 4 involves making sure the necessary equipment (small hose line or extinguisher) is ready for use.

The incorrect alternative that is most likely to be chosen is A: “tear open the wall with axes.. This alternative represents step 5 in the set of procedures. It may seem to make sense to tear open the wall once it has been discovered that the fire has extended into the wall. However, it is important that firefighters first check to ensure that they are prepared to put out any fire that will be uncovered. That is why it is important that they perform step 4 before step 5. The instructions for this item clearly indicate that the procedures are listed in the order in which they must be performed.

30. The correct answer is D. The key phrase in this item is a canvas cover has been stretched in front of the fireplace.. This represents step 1 in the set of procedures so the next step that must be followed is step 2. Step 2 involves using a small hose line to put out the fire in the fireplace.

Problem Sensitivity items –17, 18, and 24.

17. A is the correct answer. Repairing a hole in a half-filled gas tank while smoking a cigarette, make for a very dangerous fire hazard.
- B. Dose not presents an hazard, if the heater is in a safe area of the garage.
  - C. Not a hazard
  - D. This may be consider a violation.

18. C is the correct answer. Explaining the reason for breaking the windows will help the owner understand the reason his windows had to be broken, and he will calm down.

A, B, and C are all wrong because these approaches only tend to make the situation worse by further angering the owner.

24. A is the correct answer. All other violations involve conditions that would make it difficult for customers to exit the restaurant in the event of fire. Since the restaurant is to be closed for four months, these conditions pose no immediate danger and need not be corrected until just before the restaurant reopens. In contrast, Violation B - dangerous pile-ups of rubbish, waste and other flammable materials - poses a danger regardless of whether or not the restaurant is occupied because such materials could catch on fire at any time.

Deductive Reasoning items – 10, 11, 27 and 28.

10. C is the correct answer. According to the figure shown for a 5 year old, bums on both legs (32) and one arm (9) would amount to 41 percent of the child's total skin surface. Thus, 40 is the best answer. Candidates may have chosen alliterative D if they mistakenly referred to the figure for an adult since two legs (36) and one arm (9) would amount to 45 percent of an adult's skin surface. If candidates mistakenly referred to the figure for an infant, they might have chosen alliterative B since two legs (28) and one arm (9) amount to 37 percent of an infant's skin surface.

11. D is the correct answer. The total percentages of skin surface burned are calculated for each victim below:

1. Chest and abdomen (18), back and buttocks (18), left arm (9)	=	45
2. Back and buttocks (18), both legs (28)	=	46
3. Head (9), back and buttocks (18), both arms (18)	=	45
4. Both arms (18), both legs (32)	=	50

27/28. The key to questions 27 and 28 is to identify the various ways in which the classes of evacuation procedures differ, to analyze the situation presented in each item with regard to these differences, and then to identify the class that matches each situation with regard to these differences. The ways in which the evacuation procedures differ include:

- A. The type of situation in which the procedure tends to be used.
- B. Whether or not equipment is to be left in place.
- C. Whether or not the procedure is typically used after another evacuation procedure or can be performed by itself.

Each type of evacuation procedure is outlined below in terms of these 3 differences:

### Emergency Evacuation Procedures

1. Used in situations involving a potential structure collapse or hazardous materials.
2. All equipment is left in place.
3. This procedure can be conducted by itself.

### Tactical Withdrawal Procedures

1. Used in situations in which an offensive (interior attack) is being replaced by a defensive (exterior attack) strategy.
2. Personnel take all equipment with them.
3. This procedure can be conducted by itself.

### Sector Withdrawal Procedures

1. Used in situations that are so hazardous they require complete withdrawal.
2. All equipment is left behind.
3. This procedure is used after an emergency evacuation or a tactical withdrawal.

27. The correct answer is A. The incident involved a change from an internal attack to an external attack. Firefighters were instructed to take all equipment with them when withdrawing. No additional evacuation procedures were conducted before or after this one. This incident is best classified as a Tactical Withdrawal.
28. The correct answer is D. The incident involved a fire involving hazardous materials. Firefighters were instructed to evacuate the area immediately and to leave all equipment in place. This part of the incident is best classified as an emergency evacuation. Due to the nature of the incident, firefighters were further ordered to leave the area on the fire trucks and to monitor their radios for further orders. This part of the incident is best classified as a Sector Withdrawal. Thus, the best answer is D - Emergency Evacuation followed by a Sector Withdrawal.

### Inductive Reasoning items –12,19 and 26.

12. When comparing suspects in questions like this, candidates should focus on those features that cannot be changed easily. This includes sex, race, age, height, weight, and distinguishing characteristics. (Since we are dealing with witnesses' descriptions, there may be minor differences in separate descriptions of the same suspect. Therefore, it should not be assumed that we are dealing with different suspects if the descriptions differ slightly in age, height, or weight.) Features that can be changed relatively easily should be ignored when comparing suspects. Such features include hair and hair color, facial hair, and clothes.

C is the correct answer. Suspects for Fires 2, 3, and 4 have roughly the same "unchanging" features:

Sex = Male.

Race = White.

Age = Teenager.

Height = 5'5".

Weight = 140-145 lbs.

Distinguishing Characteristics = large scar directly over eyebrow.

Although the description of the suspect for Fire #3 does not include the scar, the suspect is reported to have been wearing large sunglasses, which easily could have hidden the scar. Thus, Fires #s 2, 3 and 4 may all involve the same suspect.

For a number of reasons, the description of the suspect for Fire #1 suggests a different person is involved in this fire. First, the reported weight is 175 lbs. instead of 140-145 lbs. It's difficult to believe that the same suspect could be described so differently in terms of weight. Furthermore, there is no mention of a large scar over the eyebrow. Finally, the suspect for Fire #1 was described as having a tattoo on his upper left arm. Such a tattoo was not noticed on the suspect for Fire #4 or any of the other fires.

19. C is the correct answer. All three tools listed in this question are used to enter (or cut through) structures and/or free occupants. The key words are "used to cut masonry, steel, etc.." (circular saw), "used to remove steering wheels, doors, etc. on autos in order to free occupants." (hurst tool), and "used to speed entry (or cut) through steel doors or windows and in rescue operations" (torch).

A and D are incorrect because they both describe functions that are not served by any of the equipment listed in the passage. The type of equipment that performs the function described in alternative A is an electric fan and the type of equipment that performs the function described in alternative D is an electric generator.

B is incorrect because it describes the function served by a stretcher.

26. C is the correct answer. Neither A nor B can be correct because, of the two requests made (Beta by caller 2 and Alpha by caller 4), only the first request was granted. Therefore, it would be wrong to say that patient requests are ALWAYS (alternative A) or NEVER (alternative B) honored.

Alternative C and D provide possible reasons why requests might not be honored. Alternative D suggests that patient requests are honored only if the requested hospital is the closest hospital. Caller 4 requested Alpha Hospital and was transported to Sigma. According to the information in the table, Alpha is the furthest hospital from the city in which the caller was located (Renova) and Sigma is the closest. Thus, a candidate might conclude that D is the correct response. However, caller 2 was transported to the requested hospital (Beta) even though it was not the closest hospital that would accept him. The closest hospital that would have accepted him was Alpha. Thus, the conclusion described in alternative D cannot be correct.

The correct conclusion is C - patient requests are honored only if the requested hospital admits such patients. This conclusion explains why caller number 4 was not taken to the requested hospital. That is, caller number 4 was an obstetrics case and the hospital that caller number 4 requested (Alpha) does not take obstetrics cases. In addition, the conclusion stated in alternative C also fits with the other patient request situation. Caller number 2 was a general case who requested Beta hospital. Since Beta has no admittance limitations, the request was honored.

# *PHYSICAL CONDITIONING OVERVIEW*

## *SECTION 1: INTRODUCTION*

The Physical Capability portion of the Firefighter's Exam will consist of a series of events designed to closely simulate such fire-related activities as carrying fire equipment up flights of stairs, hoisting a charged hose, navigating through a dark area on one's hands and knees, and dragging an injured victim. Performance on the test events may depend on candidates' ability in four categories of fitness that have been found to be important to the performance of the firefighter's job. These categories are cardiovascular fitness, muscle strength, muscular endurance, and flexibility.

The Physical Capability Test will be physically demanding, so it is in the best interest of each candidate to begin to prepare well in advance of the actual test. By "well in advance", we mean months, not simply weeks, of preparation. This section of the Study Guide is designed to give candidates an overview of the steps they can take to begin their preparation. Specifically, this portion of the Study Guide provides an overview of:

- \* Some medical and health related suggestions candidates should consider to enhance their general level of fitness.
  
- \* Some exercises candidates can perform to enhance their ability in each of the four fitness categories mentioned above.

This portion of the guide is divided into two sections. Section II provides a general discussion of some pertinent medical and health factors. Section III provides a general discussion of the categories of fitness that will be involved in the Physical Capability Test and the activities that can be performed to enhance ability in each of these categories.

## SECTION II: HEALTH FACTORS

### A. Medical Condition and Advisory

Candidates who decide to participate in a physical fitness and conditioning program should be medically fit. If you are not medically fit, you risk suffering medical complications and injuries during or after your participation in a program. Some medical conditions may increase a candidate's risk of injury or complications. Among these are:

- \* Muscular Disorders
- \* High Blood Pressure or Use of Blood Pressure Medication
- \* Heart Disease
- \* Infections
- \* Asthma
- \* Seizure Disorders
- \* Significant Overweight (obesity)
- \* Alcoholism
- \* Anemia
- \* Lung Disease
- \* Liver Disease
- \* Kidney Disease
- \* Diabetes Mellitus
- \* Sickle Cell Disease
- \* Dehydration
- \* Gastro-Intestinal Disorders (e.g., diarrhea, peptic ulcers)
- \* History of Heat Stroke
- \* Use of Drugs (prescription or stimulants, depressants, cocaine, heroin, or marijuana)

The above list of conditions is not intended to be a complete list of all the conditions that may place candidates at risk if they participate in a physical fitness and conditioning program. If candidates have any doubts, questions or uncertainties about their medical condition or fitness to participate in a program, it is strongly urged that they consult with their physician or medical doctor.

In addition, before beginning any fitness program, candidates should ask themselves the following questions:

1. Has a doctor ever said you have heart trouble?
2. Do you frequently suffer from pains in your chest?
3. Do you often feel faint or have spells of severe dizziness?
4. Has a doctor ever said your blood pressure was too high?
5. Has a doctor ever told you that you have a bone or joint problem, such as arthritis, that has been aggravated by exercise, or might be made worse with exercise?
6. Are you taking any prescription medications, such as those for heart problems or high blood pressure?
7. Is there a good physical reason not mentioned here why you should not follow an activity program even if you wanted to?

If the answer to any of the above questions is yes, candidates should consult their physician before beginning an exercise program. Again, candidates should also consult their physician before starting an exercise program if they have any questions or uncertainties about their medical or physical condition.

*Note:* From the PAR-Q Validation Report (modified version) by the British Columbia Department of Health. D. M. Chisholm, M. I. Collins, W. Davenport, N. Grubber, L L Kulak, 1975, British Columbia Medical Journal, 17.

## **B. Smoking**

Inhaling smoke has been linked to lung cancer, lung disorders, and coronary heart disease. Smoking also affects the ability of a person to perform aerobic tasks. The same mechanisms that eventually lead to lung disorders limit the ability of the lungs to take in air and distribute oxygen. This ability is particularly crucial when performing tasks that involve large muscle groups continually for several minutes. A candidate who smokes would be particularly affected in his or her ability to climb stairs or walk or run for any length of time, especially while carrying equipment. A smoker may not be able to do as well on an event that involved this type of activity as a nonsmoker of similar size, ability and training. Therefore, in order to maximize their potential to do well on the Physical Capability Test, candidates who smoke are urged to quit smoking as soon as possible.

## **C. Weight Control**

Carrying excess weight in the form of fat will reduce a candidate's performance potential on the Physical Capability Test. Excess weight increases the work that muscles have to do when performing a task. For example, when an overweight person walks up stairs, the leg muscles have to lift more weight and therefore have to work harder than if the person weighed less. As a result of lifting more weight, the muscles get tired more quickly and are not able to maintain the activity for as long as may be necessary. This has negative implications for test performance.

Therefore, it is highly recommended that overweight candidates try to lose weight before participating in the Physical Capability Test. This means that an overweight candidate should start trying to lose weight as soon as possible in a gradual, healthy manner, and not with a drastic diet. The best way to lose weight and keep it off is a combination of (1) eating less, but maintaining a balanced healthy diet, and (2) increasing activity level. Use stairs instead of elevators, park further from your destination and walk, make an evening walk part of your daily routine. etc.

It is important that any person who is trying to lose weight by dieting (in conjunction with a fitness program) follow a well-balanced diet that includes adequate amounts of carbohydrates, proteins, and fats. To achieve this balance, the individual should consume, on a daily basis, foods from the four basic food groups (Heyward, 1984):

1. Meat group: Two servings of meat, fish, or poultry (1 serving = 3 ounces).
2. Milk and Milk Products group: Two servings of nonfat or low-fat milk, or milk substitutes (1 serving = 1 cup).
3. Fruit and Vegetables Group: Four servings of fruits or vegetables (1 serving = 1/2 - 3/4 cup).
4. Cereal and Grain group: Four servings of breads or cereals (1 serving = 1/2 - 3/4 cup or 1 slice).

Currently, the average American gets 40% of his or her calories from fat, 40-50% from carbohydrates, and 10-20% from protein. This needs to change. The recommended levels are 30% of calories from fat, 55-60% from carbohydrates, and 10-15% from protein. The recommended daily servings of the four food groups was indicated above. This plan satisfies the basic nutrient needs, but supplies only 1200 calories per day. The average daily energy requirement is about 2100 calories per day for women and 2700 calories per day for men. So, once the daily servings are met, additional food can be added.

Some common sources of carbohydrates, proteins, and fats are listed in the following table.

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Type of Food	Common Sources
Carbohydrate (starches)	Potatoes, beans, peas, grains, flour, macaroni, noodles, and bread,  Cereals
Carbohydrate (sugars)	Candy, cookies, cakes, jelly, sugar, honey, nuts
Protein	Meat, fish, poultry, eggs, milk, nuts, beans, peas
Fats (saturated) chocolate,	Butter, animal fats, red meat, ice cream, cheese, milk,  mayonnaise and egg yoke
Fats (unsaturated)	Vegetable oil, low-fat cheese, skim milk, margarine, nuts

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When trying to lose weight, most of the carbohydrate content of one's diet should come from the starch group. Foods in this group are lower in calories than foods in the sugar group. The fat content should come from the unsaturated group. Protein should be obtained mainly from fish and poultry' in order to avoid the fat intake that would occur if red meat were consumed.

Many people consume too many of their fats from products that contain saturated fats such as red meat, ice cream, butter, etc. Consumption of saturated fats may contribute to the development of heart disease so it is recommended that most of a diet's fat content come from the unsaturated group. In fact, an easy way to cut down on one's fat intake is to simply reduce or avoid foods that are high in saturated fats, such as red meat. Just reducing one's fat intake can lead to weight reduction. For more information about diets or for more detailed suggestions about meal contents, a dietitian or physician should be consulted.

There are many misconceptions and fallacies about diets and exercise. The truth about some of the most common misconceptions are discussed below:

1. Exercise does not stimulate appetite. In fact, at times, it acts as an appetite suppressant.
2. In order to maintain the proper body fluid levels, water intake must not be reduced. Any weight loss due to loss of fluids is immediately regained after drinking, as needed by the body.
3. Exercise in rubber suits, steam rooms, and saunas must be avoided, not only because it may harm the body's temperature regulating mechanism, but also because it does not lead to fat loss. and is therefore useless.
4. Any diet that concentrates on one food group and excludes one or more other food groups should be avoided for health reasons.
5. Diets that promise rapid weight loss in excess of 2 pounds per week should also be avoided. A weight loss of 1-2 pounds per week is considered safe.
6. One cannot lose inches and reduce the fat content in a specific spot. With increased strength, the muscle size may indeed increase, but the manner in which the body loses fat is determined by heredity and not by design.

To simplify the principle of weight loss, it is important to realize that if the energy expenditure is greater than the caloric intake, weight loss will result. Eating slowly and dividing the same amount of food into more meals helps avoid the feeling of hunger. Weight control becomes possible when you consider that your eyes are bigger than your stomach and that it is easy to take in more calories than you can use. To help put this in the right perspective, consider the amount of running (at about 120 calories per mile) that is needed to bum off the calories consumed in the following snacks (Sharkey, 1979).

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<u>Snack</u>	<u>Running Required</u>
Highball	13 miles
Beer (12 oz)	15 miles
Light beer	1.0 mile
Potato chips (16)	1.5 miles
Peanuts (handful)	2.0 miles
Peanut butter and jelly (1 Tbsp)	2.6 miles

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## SECTION III: FITNESS FACTORS

### **A. Fitness Categories**

There are four categories of physical fitness including: cardiovascular fitness, muscle strength, muscular endurance, and flexibility. All four of these categories are involved in the firefighter's job and the physical capability examination. Therefore, each category is described below in terms of what it means and how it applies to the firefighter's job and physical capability exam.

1. **Flexibility:** Flexibility is a measure of the range of motion at a joint. It is developed by a program of safe, effective stretching. It is maintained by exercising each muscle group through its full range of motion and by training opposing muscles equally. (An opposing muscle group is the group of muscles that performs the opposite function of any other group.)

Flexibility will be of particular importance to events on the physical capability test that involve performing an activity within a confined space or under conditions that confine one's movement (e.g., crawling through a dark confined area on one's hands and knees). In addition, flexibility will play a role in all the test events because increased flexibility enables one to move more smoothly and easily through any required motion.

2. **Muscle Strength and Muscular Endurance:** Muscle strength is a measure of the amount of force a muscle can apply. That is, it is the most weight a muscle group can lift one time. Making a muscle apply ever-increasing forces develops it.

Muscular endurance is a measure of a muscle's ability to maintain a force or repeatedly apply a force without a rest. That is, it represents the number of times you can lift a certain amount of weight. It is developed by repetitive force applications at loads that are less than the maximum that the muscle's actually capable of applying.

Appropriate preparation for the physical capability test also will require the development of strength and endurance in the muscle groups that will be used when performing the test events. Muscle strength will be particularly important to those events that require a single application of force such as is involved in dragging a victim over a distance. Both muscle strength and muscular endurance will be important to this activities that involve maintaining a force or the repeated application of a force over a period of time such, as is involved in hoisting a hose and carrying equipment up stairs. Like flexibility, muscular endurance also will be important to performance on the test as a whole since there will be repeated instances, across events, in which force will need to be applied.

Strength and muscular endurance can be developed in one of two ways, depending on the availability of equipment. They can be developed by doing certain calisthenics (such as those presented below) which require little or no equipment, or by training with weights. Training with weights can be done either by using free weights, such as barbells, or by using weight machines, such as, for example, "Universal". or "Nautilus" systems. Once a program has begun, it should be continued for the duration of the training period.

2. **Cardiovascular fitness (aerobic stamina)**: Cardiovascular fitness is a measure of heart and lung function. It is the ability to maintain whole body activity for a length of time, that is, without running out of breath. Cardiovascular fitness is developed by aerobic activity that demands a higher heart rate than normal for 20 or more minutes (the longer the better).

It will be necessary for candidates to develop cardiovascular fitness to perform those events that involve continuous activity over an extended period of time (e.g., events that involve such activities as climbing stairs), as well as to endure through the entire series of test events.

### **B. Exercises**

The fitness program that will be outlined in the study guide distributed after the written exam will

be divided into several types of exercise activities designed to help candidates develop in each of the above 4 fitness categories. These activities include warm-up exercises, calisthenics or weight training exercises, aerobic exercises, and cool-down exercises. Each of these activities is

described below in terms of the effect they have on fitness and the exercises that can be performed.

#### **1. Warm-Up Exercises**

Warm-up exercises help develop flexibility in the major joints of the body. Warm-up exercises should always precede strenuous activity and should last 5-10 minutes because they allow:

- the individual to get physically and mentally prepared for the activity.
- heart rate and breathing to increase gradually.
- body temperature to increase slowly.
- muscles and joints to stretch.

Warm-up consists of any combination of stretching exercises, calisthenics, walking and jogging.

When doing stretching exercises, major joints and muscle groups are moved through the natural

range of motion. Each exercise is performed at a slow and constant rate without any bouncing, bobbing, jerking or lunging. When performing each exercise, you should stretch to the point that

you feel tightness but not pain, hold the position for 3 to 5 seconds, relax, and then repeat the stretch about 5 times. Avoid doing backovers or full neck circles because they can place too much stress in certain joints. In addition to walking or jogging, some specific stretching exercises

and calisthenics you can perform to warm-up are listed below. The parts of the body involved in each exercise are indicated.

- \*side to side look (neck) - while standing, turned head slowly from side to side.
- \*arm circles (chest and shoulders) - while standing with feet apart, circle arms at the shoulder. (Do this 5 times going forward and 5 times going backward.)
- \*wall stretch (calves) - while standing about 3 feet from a wall, put both hands on wall and lean forward for about 15 seconds.
- \*seated toe touches (back and back legs) - while seated with legs straight, grasp ankles and pull forward slowly until the head approaches the legs.
- \*leg stretch (lower back, abdominal, hamstrings) - while lying face up on ground, lift each leg (one at a time) straight up in air, keeping knee slightly bent. (Do 5 times with each leg.)
- \*side twister (trunk) - while standing with feet apart, brings arms out to sides and slowly twist to each side as far as possible. (Do 5 times on each side.)

## **2. Calisthenics**

Calisthenics are exercises performed without equipment such as weights. Instead, an individual's body weight is used as the load or resistance. These types of exercises can be used to develop strength and muscular endurance as well as flexibility.

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### **THE FOLLOWING EXERCISES ARE TO BE AVOIDED BECAUSE THEY CREATE TOO MUCH STRESS IN CERTAIN JOINTS.**

#### **DO NOT DO THE FOLLOWING EXERCISES**

- deep knee bends
- double leg lifts (raising both legs while lying on back)
- straight leg sit-ups (sit-ups with straight legs)
- toe-touches from a standing position (bending at waist and touching toes while keeping legs straight)

Other exercises that may be risky or relatively ineffective include: full sit ups, squat thrusts, jumping jacks, donkey kicks, and bicycle kicks.

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Some suggested exercises include:

- \*toe push ups (shoulders and arms) - while lying face down on ground with hands outside the shoulders, push up while keeping the back straight and then return until chest almost touches floor. Can also be done against a wall or while resting on knees. Increase by 1 per week.
- \*shoulder curl-ups (upper abdominal) - while lying on back with knees bent, arms crossed and hands placed behind neck, lift upper back off floor. Hold for 5 seconds and relax. Increase by 2 per week.
- \*sit ups or abdominal curl-ups (abdominal) - while lying on back while knees bent, curl up just until middle of back is off the floor and then return to back. Increase by 2 per week.
- \*side leg lift (back and thighs) - while lying on side, lift upper leg with knee straight and then return to starting position. Do lifts on one side and then other. Increase by 2 per week.
- \*bench steps (legs) - while standing, step up onto a bench, bring both feet up and then down again one at a time, as fast as possible for 30 seconds. Switch the lead foot and repeat for 30 seconds. Count steps. Increase by 10 seconds per foot per week, up to 60 seconds.
- \*leg lifts (back, buttocks and back of legs) - while lying face down, lift the whole leg from the hip. Do lifts with one leg and then the other. Increase by 1 per week.

Any calisthenics exercise routine should be performed 3 to 4 times per week. To begin with, each exercise should be performed as many times as possible at a continuous, steady pace. The same number of repetitions should be performed for each exercise during the first week. After that, the number of repetitions for each exercise should be increased each week. We'd suggest you maintain a record of your activities to help you keep track of your level of performance.

### **3. Weight Training**

Weight training consists of exercises that involve moving a weight that is external to the body. Such exercises are used to develop strength, muscular endurance, and flexibility. Particular care must be taken if free weights (e.g. barbells) are used in training. They may cause injury if they fall on a person. This can happen as a result of the hands slipping, or if a person attempts to lift a weight that is too heavy for him or her to support. For these reasons, weight machines may be safer to use in weight training. (Some calisthenics are repeated in this set in order to ensure all muscle groups are sufficiently covered.)

Some suggested exercises include:

sit-ups or abdominal curl-ups (abdominals) - see calisthenics

bench press (shoulder, chest and arms) - lie on back along a bench with feet on floor on both sides of bench. Hold bar above chest with overhand grip, hands slightly wider than shoulders and elbows straight. Lower bar to chest and then immediately return to starting position.

side leg raises (hips and thighs) - standing with side to pulley at pulley station and holding it with one hand, hook ankle of outside leg to pulley. With knee slightly bent, move leg to side as far as possible and then return to starting position. Repeat with inside leg. Then turn around and repeat from other side.

arm curls (elbows) - standing with elbows straight and in front of thighs, hold bar with underhand grip, hands shoulder width apart. Keep elbows close to sides, bend elbows and raise bar to chest. Then slowly lower bar to starting position. Do not lean backward or forward.

lateral pull downs (shoulders and arms) - start from a sitting or kneeling position on floor. Grip bar with palms forward, hands more than shoulder width apart and elbows straight. Pull bar down to base of neck and shoulders and slowly return to starting position.

### **4. Aerobic Training**

Aerobic training refers to training the heart-lung or cardiorespiratory system. It involves strengthening the heart muscle and improving the ability of the circulation system to deliver oxygen from the lungs to the muscles. The training of the cardiovascular system is accomplished by continuous motion over a length of time, using large muscle groups. In other words, activities in which "wind" is a factor depend on cardiovascular conditioning. Activities such as walking, jogging, bicycling, stair climbing, rowing, and swimming are used for aerobic training. Whichever activity is chosen, it should be performed at least 3 times a week for at least 20 minutes each time.

### **5. Cool Down**

The cool-down phase is as critical as the warm-up and should be performed for 5 to 10 minutes at the end of each exercise period. This phase of activity is important because:

it allows heart rate to decrease gradually. continued activity maintains adequate circulation, prevents pooling of blood, and hastens recovery.

Cooling down consists of easy jogging, walking, light calisthenics, and stretching exercises. After an aerobic training session, begin to jog, then walk rapidly for a total of about 5 minutes. Continue with moderate walking. Afterward, do the following stretching exercises: seated toe touch, wall stretch, side twister, and arm circles. These exercises are described in the warm-up section above.

If your workout session consisted of only the strength and muscular endurance exercises, perform the above exercises from the warm-up set and then walk at a moderate pace for a few minutes as your cool-down session.

### **C. Unusual Reactions**

.If, during or immediately after exercise, you have any of the following reactions, stop exercising immediately and consult a physician as soon as possible:

- \* labored or difficult breathing (not the deep breathing normally associated with exercise)
- \* loss of coordination
- \* dizziness
- \* tightness in the chest

### **D. General Directions for Fitness Program**

The strength and muscular endurance exercises do not have to be done on the same day or during the same exercise session as the aerobics program. In other words, they may be done on separate days or at different times on the same day. However, every exercise session should be preceded by a warm-up period and followed by a cool-down period. For example, if the strength and muscular endurance exercises are done on the same day but at a different time than the aerobics program, warm-ups and cool-down exercises should be performed before and after each of the two exercise sessions.

## **SECTION IV: REFERENCES**

The following sources were used as references in developing this overview.

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