Water Line Repair

Problem Booklet

Instructions

Read the problem on the next page and study the map on page 4. Think about the problem for a moment. You will be asked a series of questions. Each question is followed by four choices. There is one correct choice for each question.

After you have selected a choice to a question, look up the number for that choice on the answer sheet. Rub the developing pen between the brackets by your choice. A message will appear and tell you if this is correct or if you need to "Try again!" The object is to select the correct answer for each question in as few attempts as possible.

Read the questions one at a time. Don't jump ahead. However, you can look back at previous questions and your answers anytime you wish.

At the end of the exercise you will learn how to score your performance.

Now, turn the page and begin the exercise.

Problem

You are working with Big Tom Bell repairing a leaking water line in neutral air beside the belt in # 3 entry. The permissible scoop you and Tom used to bring in your tools is parked in the #2 entry, part of the return airway. (See the map in Figure 1.)

The coal is 48 inches high. The belt is running. There are 10 workers at the face 1000 feet inby your position.

As you work in the belt entry you smell something like burning coal. There is no sign of smoke. Tom tells you not to worry about the smell, that it is just the fumes from a hot bearing on a belt roller a few crosscuts outby. He tells you the bearing was replaced a little while ago. You soon get a bad headache.

Tom sends you back into the return air to the scoop to get a tool. When you come back into the belt entry your head still aches and you feel sick to your stomach. You still smell something like coal burning. You quickly look inby and outby. There is no smoke. Everything looks normal.

As you move outby toward Tom you see his cap lamp on the mine floor. You yell to him and he doesn't answer. When you reach him he is lying on the ground unconscious.

Think about this situation. Study the mine map on the next page. When you are ready, turn the page and answer the questions.

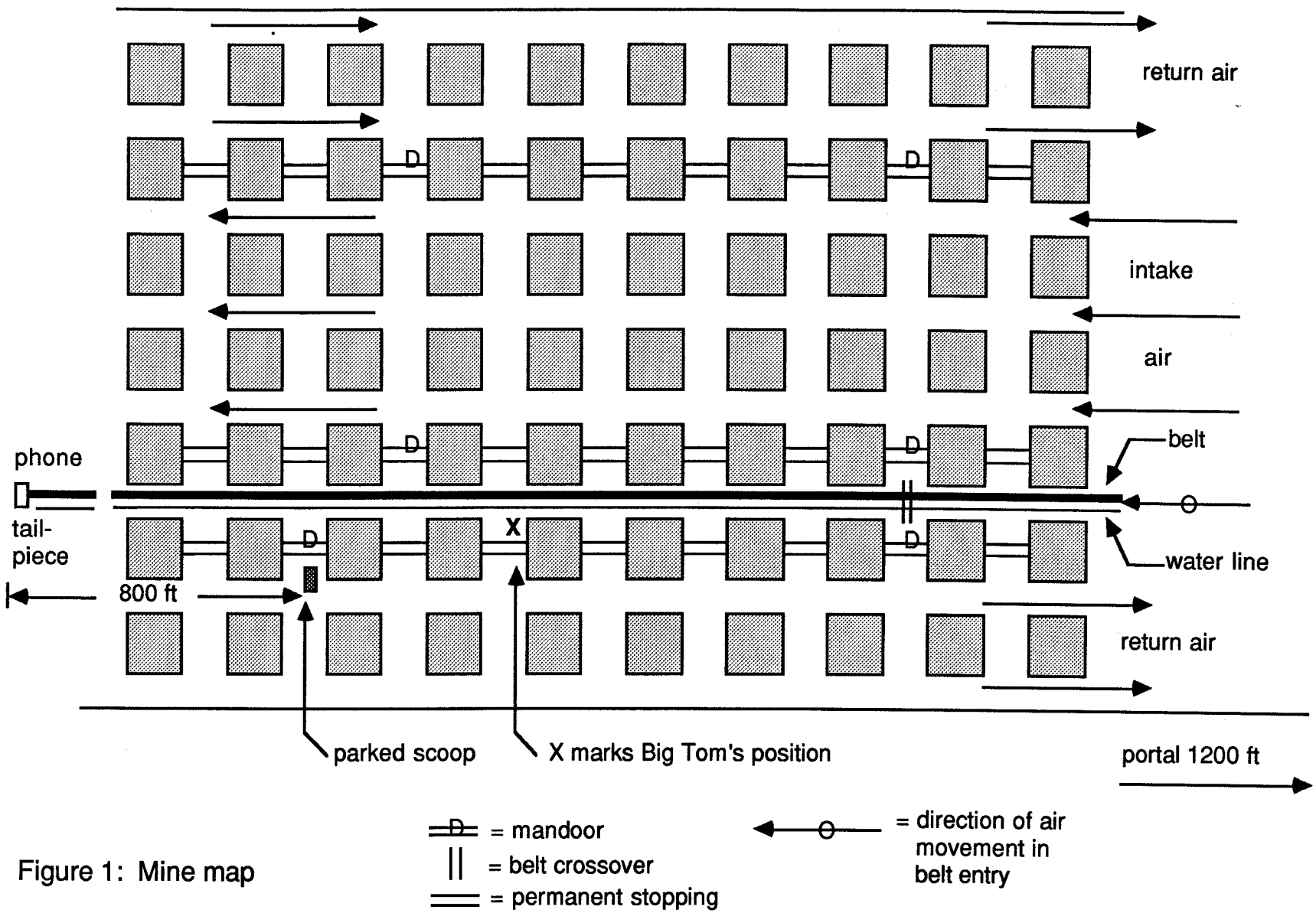

Figure 1: Mine map

Question A

At this point it would be best to:

1. Grab Tom and drag him two crosscuts back toward the mandoor where the scoop is parked and get him in the return air.

2. Grab Tom and drag him outby five crosscuts to the belt crossover and get him into the intake air.

3. Put your filter self-rescuer on yourself, (the one you have on your belt).

4. Check Tom to see if he is breathing and give him mouth to mouth resuscitation if he is not.

Question B

You put on your filter self-rescuer (FSR). You have a throbbing headache and you feel short of breath, dizzy, and weak. You are still in the belt entry with Tom. (See Figure 1.) He is still unconscious. When you look at him closely you see his face and lips have a red flush.

At this point you should suspect:

5. Methane.

6. Blackdamp (oxygen deficient air).

7. Heart attack.

8. Carbon monoxide.

Question C

You are still in the belt entry with Tom. He is still unconscious. At this point it would be best to:

9. Cut the belt safety line (also called the belt control line).

10. Give Tom CPR.

11. Hurry back to the scoop in the return air, tram outby and call for help.

12. Carefully examine Tom to see if he has any other injuries and give him first aid if he needs it.

Question D

You cut the safety line and the belt stops. You are still in the belt entry with Tom and he is still unconscious. (See Figure 1.) Your filter self-rescuer is getting hot as you breathe through it.

At this point it would be best to:

13. Drag Tom five crosscuts outby to the belt crossover and through the mandoor into the intake airway.

14. "Logroll" Tom under the belt, drag him inby one crosscut and then pull him up to the mandoor into the intake airway.

15. Take Tom's filter self-rescuer out and put it on him so he can breathe through it.

16. Drag Tom two crosscuts inby and through the mandoor to the scoop in the return airway.

Question E

You are very weak and have a pounding headache. You feel like you will vomit. Your thinking is slow and difficult. With great effort you get Tom rolled under the belt toward the intake air. After this you have to stop and rest. The air coming through your filter self-rescuer is getting hotter. Now you drag Tom inby into the crosscut near where the mandoor goes into the intake air. You are so weak you can't drag him any further. (Look at Figure 2 below.)

Now it would be best to:

17. Sit quietly next to Tom waiting to get your breath back so you can continue to drag him to the mandoor and into the intake air.

18. Leave Tom where he is (in the crosscut by the mandoor to the intake air). Feel the door. If it is cool, open the door, and check the air.

19. Leave Tom where he is, crawl back under the belt, go through the mandoor to the scoop, tram inby to the phone at the tailpiece and call for help.

20. Crawl back under the belt, go through the mandoor into the return air to the scoop. Tram inby to the tailpiece where the oxygen generating SCSR's are located. Put one on yourself and take the other one back to Tom and put it on him.

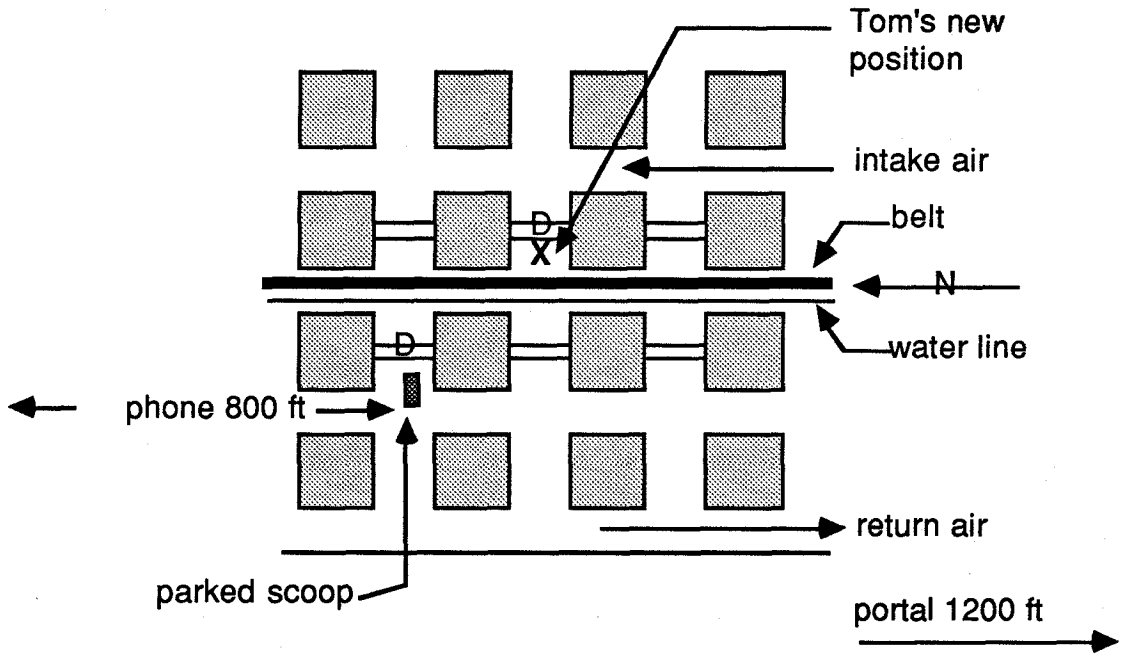

Figure 2: Portion of mine map showing Big Tom's new position

Question F

You leave Tom about two feet from the mandoor. You are so weak you can't drag him anymore. The mandoor is cool so you push it open into the intake air. A stream of fresh air blows in on you. You are too weak to pull Tom through the door. You barely pull yourself through. You collapse on the intake air side of the door, propping it open by leaning against it. Soon your self-rescuer cools and you take it off. The air smells fresh. You rest for a few moments. At this point it would be most important to:

21. Close the mandoor and go inby to the section to get help.

22. Close the mandoor, rest for a few moments, then go back into the belt entry and pull Tom out fast.

23. Leave the mandoor into the belt entry wide open, watch Tom, and wait for help.

24. Close the mandoor, then move outby in the intake air to get help.

Question G

What might have been a likely source of the carbon monoxide that overcame Tom?

25. An electrical cable fire on a roof bolter at the face.
26. Cutting into old works at the face.
27. A leaking seal from a bleeder entry around a gob area.
28. The slow combustion of coal dust on the mine floor around the belt.

Question H

Assume that there was 0.2% (two tenths of one percent) carbon monoxide in the air where Tom went down when he was fixing the water line. What can you predict about Tom's condition if he were to stay in this place for 60 minutes without protective breathing equipment?

29. He will be dead.

30. He will remain unconscious but recover in a few minutes once he is in fresh air.

31. Once he has some oxygen he will regain consciousness and be O.K. in an hour or two.

32. A 0.2% concentration of carbon monoxide might cause a headache, but it wouldn't put a healthy miner out.

Question I

In situations like this problem, which instrument would warn miners that a small (but dangerous) amount of carbon monoxide was present?

33. Flame safety lamp

34. Methane detector

35. Oxygen analyzer

36. None of the above

Question J

In quiet air that is not moving, where is carbon monoxide most likely to accumulate and why?

37. Near the mine floor because it is heavier than air.

38. Near the mine roof because it is lighter than air.

39. Near the source of the fire as the gas is produced.

40. Near the mine roof because it is heavier than air.

Scoring your performance

1. Count the total number of responses you colored in that were marked "correct". Write this number in the first blank on the answer sheet.

2. Count the total number of "incorrect" responses you colored in. Subtract this number from 30. Write the difference in the second blank on the answer sheet.

3. The best score is 40. The worst score is 0.