

Sammy's Loose Roof Decisions

Problem Booklet

Instructions

Read the problem situation described on the next page. Then, answer each of the 8 questions. Do them one at a time. Some questions will ask you to look at one or more 3-D slides. Follow the directions for each question. Look at the appropriate slide or slides, then continue on with the exercise. Don't jump ahead, but look only at the questions and slides to which you are directed. However, you may look back to earlier questions and answers at any time. Some questions ask you to select all of the answers that you think are correct. Other questions ask you to select only one answer unless you are told to "Try again!"

After you have selected a choice to a question, look up its number on the answer sheet. Select your answer(s) to each question by rubbing the developing pen between the brackets on the answer sheet. A hidden message will appear and tell you if you are right. When you have finished, you will learn how to score your performance.

Background

You are the transitman on a mine surveying crew and have been assigned a new helper, Sammy Spadd.

Sammy has one year of mining experience, mostly as an engineering trainee.

You normally hurry to get sights set at the end of a shift because incoming crews don't like to wait for new sight lines.

The mine is a drift opening with an average coal seam height of 5 1/2 feet.

Problem

During your routine survey work in recent weeks, you observed that an idle section in 2 North mains, about 3 miles from the portal, has been experiencing serious roof problems. You were told by one of the mine engineers that the problems are due to the sudden presence of slips in the roof running in the direction of mining. Several falls and significant downtime have forced the company to reconsider the development of 2 North. On this particular day the general superintendent informs you and Sammy that the company decided to reactivate the idled section beginning next shift. You are to set sights in 2 North to re-orient all the entries by 45 degrees to the east. You are to begin your work before the regular daylight crew arrives.

Turn to the next page and do Question A.

Question A

You and Sammy have your gear assembled and are ready to go underground. You enter the portal and travel to 2 North in a track-mounted supply jeep.

What are some things you should watch for? (Select as MANY as you think are correct)

1. Roof bolts that are spaced too far apart.
2. Fresh spalling from the ribs.
3. Areas where the immediate roof has fallen from around the bolt head.
4. Bolts that are placed in isolated areas of high roof.
5. Roof bolts that are pulled into wood header boards.
6. Installation of inappropriate types of bolts.

When you have made your selection(s), do the next question.

Question B

As you and Sammy continue traveling to the section, you come upon a track switch. Sammy gets out of the jeep to throw the switch. He observes a low spot (sometimes called a "brow") in the roof a few feet in by the switch area. LOOK AT SLIDE 1.

What should Sammy do at this point? (Select as MANY as you think are correct)

7. Without going under the low spot, visually inspect the top from a safe distance.
8. Throw the switch and wave you ahead.
9. Move under the low spot, then visually inspect and sound the roof.
10. Move closer to the low spot and sound the roof.

When you have made your selection(s), do the next question.

Question C

Sammy throws the switch and you drive forward in the jeep. As you and Sammy pass the low spot, you look back. Here is what you see. LOOK AT SLIDE 2.

What should you make of the situation? (Choose only ONE unless you are told to "Try Again!")

11. This section of top will probably fall eventually but it isn't an immediate hazard.
12. You have seen situations like this before and the roof remained intact, so don't be overly concerned.
13. This section of roof is a potential hazard.
14. Since you and Sammy are in by the low spot and time is critical, continue going to the section so you can begin surveying.

Question D

Now that you and Sammy have identified this condition as a hazard, what should you do about it? (Choose only ONE unless you are told to "Try Again!")

15. Continue on your way with Sammy and report the bad top when you get to the section.
16. Look around for some timbers, and then, set a few posts.
17. Send Sammy to the section to call out and report the bad roof condition while you wait at your present location.
18. Take the pry bar from the jeep and scale down the bad top.
19. Take the jeep outby to the portal so you and Sammy can report the bad top and warn the incoming miners.

Question E

Two experienced roof control persons respond to Sammy's call and come to take care of the problem. Meanwhile, Sammy comes back, picks you up, and you head for the section. Now, because of the delay, you are behind schedule and in a hurry to start setting new sights. In the process of making a visual inspection of the workplace this is what you see outby the face in the first entry where you planned to begin surveying. LOOK AT SLIDES 3, 4, and 5.

What should you suspect? (Choose only ONE unless you are told to "Try Again!")

20. Moisture accumulating along the roof/rib interface has caused the rockdust to fall away.
21. The immediate roof was loaded by moving strata from above and this led to fracturing at the roof-rib interface.
22. A slip developed along the left rib similar to what the section has been experiencing lately.
23. Bad mining practices were followed by the continuous miner operator.

Question F

You have identified the problem as cutter roof. To begin your work you need to send Sammy 100 feet outby for a backsight. He will be near the cutter roof area.

What should you do now? (Choose only ONE unless you are told to "Try Again!")

24. Begin surveying for the new entry sight lines.
25. Tell Sammy to keep people out of that entry while you call out and report the condition.
26. Don't worry about the roof conditions. It probably has been there a few days and poses no serious hazard.
27. Begin setting a line of posts along the rib in the affected area.

Question G

Because you called out to report the hazardous roof condition, the general foreman sent in a crew to take care of the cutter roof problem. They placed a line of wood posts along the rib extending for approximately 40 feet down the entry. The top will be watched for further crumbling at the interface of the roof and rib. Cutter roof can advance if the affected area is not adequately supported. You and Sammy can now safely set sights in 2 North.

All underground workers should know how to recognize the beginning stages of cutter roof and understand the reasons for this type of roof hazard. LOOK AT SLIDE 6. It shows an example of cutter roof in its initial development.

Which conditions usually cause cutter roof? (Select as MANY as you think are correct)

- 28. Multiple seam mining.
- 29. High horizontal stresses within the mine roof.
- 30. Cutting the entry too wide.
- 31. Clay veins running along one side of an entry near the rib.
- 32. Variations in strength of individual roof strata.

When you have made your selection(s), do the next question.

Question H

Which one of the following statements about cutter roof is true? (Choose only ONE unless you are told to "Try Again!")

33. If the crumbling and flaking of the mine roof produces a channel only an inch or two deep, there is little danger of a major roof fall.
34. If the crumbling and flaking of the roof produces a channel about an inch or two deep, only the immediate mine roof has moved.
35. Cutter roof will generally fail in shear at one rib line.
36. If the cutter roof produces only a very narrow crumbling zone, the pillar has probably shifted slightly and widened the entry.
37. A cutter along one side of an entry is usually not a serious hazard.
38. Cutter roof only occurs in mines that have shales and thin bedded sandstones in the immediate roof.

End of Problem

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 25. Write the difference in the second blank on the answer sheet.
3. The best score is 38. The worst score is 0.