

TRENCHING AND EXCAVATION

1926, 651

Table P-1

APPROXIMATE ANGLE OF REPOSE FOR SLOPING OF SIDES OF EXCAVATIONS

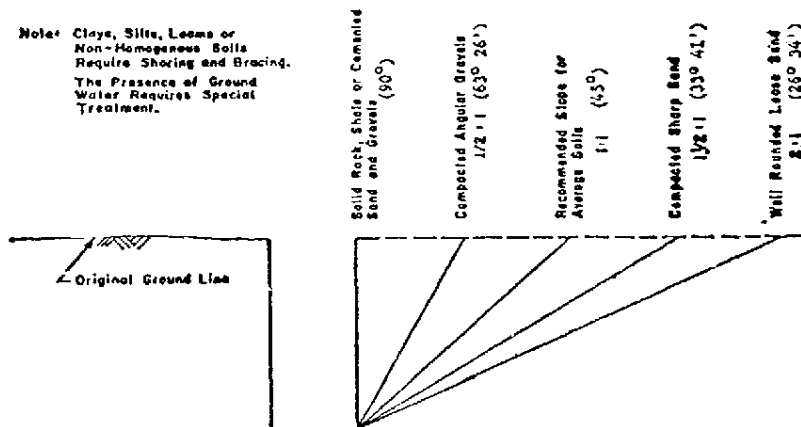


TABLE P-7
TRENCH SHORING—MINIMUM REQUIREMENTS

Depth of trench	Kind or condition of earth	Size and spacing of members										
		Uprights		Stringers		Cross braces ¹				Maximum spacing		
		Minimum dimension	Maximum spacing	Minimum dimension	Maximum spacing	Width of trench						
						Up to 3 feet	3 to 6 feet	6 to 9 feet	9 to 12 feet	12 to 18 feet	Vertical	Horizontal
Feet		Inches	Feet	Inches	Feet	Inches	Inches	Inches	Inches	Inches	Feet	Feet
5 to 10	Hard, compact.....	3 x 4 or 2 x 6	6			2 x 6	4 x 4	4 x 6	6 x 6	6 x 8	4	6
	Likely to crack.....	3 x 4 or 2 x 6	3	4 x 6	4	2 x 6	4 x 4	4 x 6	6 x 6	6 x 8	4	6
	Soft, sandy, or filled.....	3 x 4 or 2 x 6	Close sheeting	4 x 6	4	4 x 4	4 x 6	6 x 6	6 x 8	8 x 8	4	6
	Hydrostatic pressure.....	3 x 4 or 2 x 6	Close sheeting	6 x 8	4	4 x 4	4 x 6	6 x 6	6 x 8	8 x 8	4	6
10 to 15	Hard.....	3 x 4 or 2 x 6	4	4 x 6	4	4 x 4	4 x 6	6 x 6	6 x 8	8 x 8	4	6
	Likely to crack.....	3 x 4 or 2 x 6	2	4 x 6	4	4 x 4	4 x 6	6 x 6	6 x 8	8 x 8		6
	Soft, sandy, or filled.....	3 x 4 or 2 x 6	Close sheeting	4 x 6	4	4 x 6	6 x 6	6 x 8	8 x 8	8 x 10	4	6
	Hydrostatic pressure.....	3 x 6	Close sheeting	8 x 10	4	4 x 6	6 x 6	8 x 8	8 x 8	8 x 10	4	6
15 to 20	All kinds or conditions.....	3 x 6	Close sheeting	4 x 12	4	4 x 12	6 x 8	8 x 8	8 x 10	10 x 10	4	6
Over 20	All kinds or conditions.....	3 x 6	Close sheeting	6 x 8	4	4 x 12	8 x 8	8 x 10	10 x 10	10 x 12	4	-

¹ Trench jacks may be used in lieu of, or in combination with, cross braces. Shoring is not required in solid rock, hard shale, or hard slag. Where desirable, steel sheet piling and bracing of equal strength may be substituted for wood.

SUPERVISORS SAFETY SEMINAR II EVALUATION

Please answer each question or circle the response that best describes your feelings about the statement under consideration. Please respond to all the questions or statements. You do not need to sign the evaluation.

1. Supervisors Safety Seminar II included six separate presentations - "What OSHA Is and How It Works," "OSHA Inspections," "Workplace Violations," "Electrical Violations," "Machine Guarding & Other Violations," and "The Big Ten Health Hazards." Can you suggest a more effective way of handling any of the presentations in future sessions.

2. The slides of actual conditions at the Baton Rouge Chemical Plant made the presentations more realistic.

- | | |
|----------------------|----------------------|
| 1. Strongly Disagree | 3. Agree 7 |
| 2. Disagree | 4. Strongly Agree 15 |

Comments: _____

3. The slides used were relevant to the presentations.

- | | |
|----------------------|----------------------|
| 1. Strongly Disagree | 3. Agree 10 |
| 2. Disagree 2 | 4. Strongly Agree 10 |

Comments: _____

4. The team exercise got me to identify problems I may have in complying with OSHA regulations and to plan for their resolution.

- | | | |
|----------------------|---------------------|-----------|
| 1. Strongly Disagree | 3. Agree 15 | |
| 2. Disagree | 4. Strongly Agree 6 | 1 No Vote |

Comments: _____

Handwritten signature: J. J. [unclear]

5. In the team exercise I was able to use techniques and ideas I learned in previous training programs such as Supervising For Excellence.

1. Strongly Disagree	3. Agree 21
2. Disagree	4. Strongly Agree

Comments: _____

6. The final exercise gave me practice and confidence in identifying and classifying OSHA violations.

1. Strongly Disagree	3. Agree 10	
2. Disagree 2	4. Strongly Agree 9	1 No Vote

Comments: _____

7. Mr. Carmena was used effectively in the Seminar.

1. Strongly Disagree	3. Agree 12
2. Disagree	4. Strongly Agree 10

Comments: _____

8. The program met the objective of improving my knowledge of the OSHA Act.

1. Strongly Disagree	3. Agree 14
2. Disagree	4. Strongly Agree 8

Comments: _____

9. Compared to other supervisory training programs I have attended, Supervisors Safety Seminar II would be.

1. Near the Bottom	3. Average 5	
2. Below Par	4. Above Average 16	1 No Vote

Comments: _____

10. Please give us any other comments or suggestions you have about Supervisors Safety Seminar II.

Comments

1.
 - ° Get a better place with more comfortable chairs.
 - ° Very well presented. Certainly does a more effective job than a constant change of speakers
 - ° I think we get too far off the track when team exercises are used, and much more information can be passed on by more direct methods.
 - ° Overall, very good. If the session is to be given in one day, consider eliminating some of the workbook exercises. These could be done outside. If possible work in a little more group participation - not essential, but might help.
 - ° The topics covered by the speaker should be shown in outline on a separate screen.
 - ° No. I think the video/slide presentation was very good. Using both kept the program moving rapidly, but not too rapidly.
 - ° Well presented (5 comments)
 - ° Try to cut down on time spent on Big Ten Health Hazards.
 - ° Give more detailed information about asbestos and silica and what we intend to do to correct existing conditions (sandblasting, asbestos blankets, etc.)
 - ° Need more time for discussion between chapters.
 - ° More in-depth discussion.
 - ° More discussion would be helpful, especially in the industrial hygiene area.
2.
 - ° Added considerably to the program.
 - ° Focuses attention where it lies.
 - ° Brings the message home
 - ° Excellent idea and recognizable situations and places drove home the fact that we do have problems - even with our emphasis on safety.
 - ° Focuses attention on application to our areas.
 - ° Much better than on previous seminar.
 - ° Certainly more - not less. Some points seem best made by slides alone.
 - ° Good approach

3. ° Should not stress individual identification with slides in front of group.
 - ° Try to get slides with specific items to fit 25 most cited items by OSHA.
 - ° Taught me to be more observant.
4. ° Three of the problems were essentially identical. Different questions might be more useful.
 - ° Helped recognize and try to solve problems.
 - ° Our exercise was more useful in helping me think about and understand our safety program in general. I realize how good a program we have relative to a probable industry average.
 - ° Organized effort necessary for compliance.
 - ° The thing not covered was what time frame do we have to make corrections, i.e., what priority is needed or what manpower do we need and when to get corrections made in timely fashion.
 - ° Give out some material to be read before attending seminar.
 - ° Gave me more insight about OSHA. Need more of this.
5. ° Did not go to Supervising for Excellence (3 comments)
 - ° Came in handy.
 - ° Yes, team work of problems.
 - ° Agree, however, in this type of program I personally think more information and less participation is attractive even considering the involvement and interest angles.
6. ° Practice more than confidence.
 - ° Define problems.
 - ° Not enough time to classify.
 - ° Right to the point.
 - ° Good exercise.
 - ° Hard to decide how others evaluated.
 - ° Probably not as effective as it could have been. Fire extinguishers and housekeeping disproportionately stressed.
 - ° More time would have revealed more things.

7.
 - ° Knew his subject matter well.
 - ° His expertise was respected and helpful.
 - ° Excellent instructor.
 - ° Background and experience.
 - ° He is an asset to the program and should be used for the complete course if continued.
8.
 - ° More details application.
 - ° Was unfamiliar with scope of act.
 - ° Give guides on specific OSHA regulations for use in meetings with wage people
 - ° Yes, I did lack the proper information.
9.
 - ° Excellent
 - ° More to the point.
 - ° Very good subject.
 - ° Seminar #1 was above average also.
 - ° Average compared to the other programs which were very good.
 - ° Better preparation.
10.
 - ° Move program to better location.
 - ° It may be beneficial to the participants to indicate the growth of safety personnel in numbers and time frame since 1965 (Co. split) to indicate the priority on safety to give confidence to people that safety work will be done.
 - ° More.
 - ° Very good. May need to lengthen to 2 days.
 - ° Session should be 2 days long to allow full discussion. Some questions I wanted to ask were not asked because of the rush to get to the next topic.
 - ° Better chair and seating arrangements. Also, raise the TV screen to where it can be seen.
 - ° Very good.

- ° Better definition for types of accidents - serious, non-serious, DeMinimis, etc.
- ° Very appropriate.
- ° Strongly suggest that the atmosphere in the breathing zone of workers be explained and suitable warnings be given. Almost all vapors in chemical plant environment are toxic at high levels.
- ° Prepared me to observe more closely the potential safety hazards we work around every day.
- ° By use of video tape one could see and better understand problems. Slides were also very helpful.
- ° Strongly believe all plant supervision should attend.
- ° Should be presented to all supervisors and some modification should be available to wage earners.
- ° The tape presentations were not boring and the accompanying exercises broke the monotony. Enjoyed the class.

We showed you this module to make you aware that there may be potential hazards to health in the plant as well as the more familiar problems with accidents and injuries.

Concern for industrial health is not new to Eupen. We have had an industrial hygienist in the Medical Department for many years, long before the government even thought of OSHA. We are always available for advice and consultation if you have a problem. I think you might have a problem in this area.

Let me assure you that as supervisors, industrial hygiene will be a significant part of your future. The interest of the worker in health and safety is mushrooming. Perhaps it's a spinoff of the consumer/environment ecology movements. But for whatever reason, it is fortunate that our ~~peo~~ people are finally becoming more concerned and more knowledgeable.

As a result, you, as their supervisor must become more concerned and more knowledgeable hand-in-hand w/ the increase in interest has come the passage of ^{many new} government regulations for occupational exposures. You will need to become familiar with the ones which affect you.

We in the industrial hygienist office will help you but you must help us in identifying potential problems. It's impossible for us to be aware of every hazard in every unit and we depend upon you to use your eyes, your ears your nose and your common sense to spot problem areas.

Alright, by way of review let's work exercise # 1 in your workbook & - I'll try to answer any questions which you might have.

EXERCISE

Thank you for your attention, keep your eyes & ears open & let us know if we can help.

OSHA, EXXON AND YOU

BR 102

The attached test packet was prepared for a program which utilizes all seven segments of the module. If it is desired to exclude any of the segments, refer to the table below which identifies the questions which apply to each of the segments and the maximum score possible for each segment. Questions which have a value greater than one have their maximum score given in parentheses to the left of the question number.

<u>Segment No. and Title</u>	<u>Questions</u>	<u>Max. Score</u>
Seg. I - What OSHA Is and How it Works	1 - 7	8
Seg. II - OSHA Inspections	8 - 12	12
Seg. III A - Workplace Violations	13 - 25	28
Seg. III B - Electrical Violations	26 - 43	21
Seg. III C - Machine Guarding & Other Violations	44 - 50	9
Seg. IV A - Occupational Disease	51 - 59	18
Seg. IV B - Specific Health Hazards	60 - 79	<u>30</u>
Maximum Total Score		<u><u>126</u></u>

OSHA, EXXON AND YOU

BR-102

TEST

1. The letters OSHA stand for the _____
and _____.
2. The objective of Congress when it passed OSHA was to assure, so far as possible, every working man and woman in the nation safe and healthful working conditions and to preserve our human resources. True _____.
False _____.
3. All employees whose employer is engaged in business affecting _____ excluding federal, state and local governments are covered by the Act. Also excluded are those employees who are covered by similar governmental programs already in effect such as the Federal Coal Mine Act and the Atomic Energy Act.
4. OSHA lists two employer responsibilities:
 - To furnish each of his employees working conditions that are free from recognized safety and health hazards that are causing or likely to cause death or serious physical harm.
 - To comply with the specific safety and health standards which have been made law.

The first responsibility as given above is frequently referred to as the _____ Clause.

5. OSHA requires that a citation be issued to either the employer, the employee, or both the employer and employee for violations of the Act depending upon who is at fault. ____ T ____ F.
6. OSHA will permit individual states to develop and administer their own safety and health standards and to establish their own inspection force as long as the state's program is as effective as OSHA's - True ____ False ____.
- (2) 7. The initial safety standards made into law by OSHA were primarily adopted from two national standards organizations. Name these organizations.
- a. _____
- b. _____
- (4) 8. OSHA has established a priority system to decide which businesses to inspect. The factors considered are listed below but not in order of importance. Arrange the factors in order of decreasing importance by placing the appropriate number to the left of the factor with 1 being the most important.
- _____ Target Industry - Those industries with poor accident and health records such as lumber and wood products, roofing and sheet metal, mobile home manufacturing, longshoring, industries with high and repeated exposure to harmful materials such as asbestos, cotton dust, silica, lead, carbon monoxide.
- _____ Random selection
- _____ An accident or industrial disease which involved a fatality or requires the hospitalization of 5 or more persons.
- _____ Employee complaint of an OSHA violation.

9. OSHA permits an employee who has submitted a complaint of an OSHA violation to have his name withheld from the employer. Further the law protects an employee submitting a complaint from any act of reprisal due to his submitting a complaint.

True _____. False _____.

- (2) 10. The OSHA Compliance Officer will normally have two representatives accompany him when he makes his inspection. Who do these individuals represent? _____

- (4) 11. Under imminent danger conditions an OSHA Compliance Officer will do the following:

True False

- a. ____ ____ Notify the employer of the conditions and attempt to convince him to move his employees until the problem is corrected.
- b. ____ ____ Order the employer to shut down the operation and remove his employees until the danger is eliminated.
- c. ____ ____ Notify the employees of the charges and order them to clear the above site until the danger is eliminated
- d. ____ ____ Notify his Area Director of the condition and if the Area Director agrees, the Area Director will request the U. S. District Court having jurisdiction to issue a restraining order shutting down the equipment or condition which created the problem.

12. A citation for a violation of OSHA must be posted at the location where the violation exists for a period of three days or until the violation is eliminated whichever is shorter. ____ T ____ F

- (3) 13. OSHA Compliance Officers concentrate on violations of standards involving poor housekeeping, open-sided floors, and stairway handrails because:

- a. ____ T ____ F Violations of these standards lead to falls which can seriously injure employees.
- b. ____ T ____ F These violations are easy to spot.
- c. ____ T ____ F The President made these areas target areas in his speech announcing the new law.

14. Good housekeeping is an important part of both Process and Mechanical's job if a safe workplace is to be maintained. ____ T ____ F
15. Fixed ladders which are over 20' in height do not require the entrance to be protected if the ladder is equipped with a cage. ____ T ____ F
- (2) 16. Temporary floor openings should be protected by either a _____ or _____.
17. Open-sided floors, platforms and runways require standard handrails if they are _____ feet or more above grade or other working surface.
18. _____ are required for stairs with 4 or more risers.
- (3) 19. Exit signs must be readily visible, with letters at least 6 inches high, of a color _____ from its background and be lighted either _____ or _____.
- (4) 20. Fire extinguishers should be _____ and conspicuous. They should be inspected monthly as a minimum to see that they are _____, have not been _____ or _____.
21. Shoring or sloping of trenches and excavations will normally be required if the excavation is _____ or more feet deep.
- (2) 22. A ladder or equivalent safe access is required if the trench or excavation is _____ feet or more deep. This should be no more than _____ feet from the people working in the excavation.
23. Excavated material or other materials, like piping, boards, etc., should be placed no closer than _____ feet from the edge of the excavation if people will be working within the excavation.

- (6) 24. The basis for the scaffold standard is that it is important to provide the employee with a good surface to work from. If the work can't be reached from the ground or some other solid surface, a sturdy ladder or good scaffold should be provided. Name six of the eight factors pointed out in this segment which are required for a good scaffold.

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____

- (2) 25. The horses for a light duty scaffold (25#/Sq. Ft.) should be no more than _____ feet apart. For a medium scaffold (50#/Sq. Ft.) they should be no farther than _____ feet apart.

26. OSHA adopted the entire National Electrical Code, NFPA 70-1971 and made it applicable to all new installations and every major revamp made after March 15, 1972. _____ T _____ F

27. Electrical classification of unit areas, building, shops, etc., are made in order to assure that electrical equipment purchased for or used in the area will not cause a fire or explosion. _____ T _____ F

- (3) 28. The first thing which an electrical engineer must establish when classifying an area is the type of combustible or flammable material in the atmosphere. For the three classes given below select the correct answers from the column on the right and put the appropriate letter in the blank.

Class I _____	a. Combustible dusts of coal, coke, metals, etc.
Class II _____	b. Coal, coke, wood chips, paper
Class III _____	c. Hydrocarbon vapors and gases
	d. Lint or flyings from cloth.

29. An area which would normally contain an air/vapor mixture which was in its flammable range would be classed as (Division I/Division II)?

30. In simple terms define what is meant by an unclassified or general purpose area classification.

31. Most areas on a typical Refinery or Chemical plant operating unit would normally have what area classification? _____

- (2) 32. Electrical equipment, battery powered instruments, electric tools purchased for use in Unclassified Areas should not be used in _____ or _____ areas without a hot work permit or modification of the equipment or special approval by the safety department.

33. Low voltage, battery powered instruments, tools or communication equipment do not have sufficient energy to "set off" a fire or explosion. _____ T _____ F

34. Intrinsically safe on the label of a piece of electrical equipment means in simple terms _____

35. Mercury vapor light fixtures can be interchanged for incandescent light fixtures because a mercury vapor light will operate cooler than an incandescent light of the same wattage. _____ T _____ F

36. Since explosion proof housings are designed with a 4 to 1 safety factor up to 25% of the cover bolts or 25% of the effective thread area can be left out or disengaged with no real loss of effectiveness. _____ T _____ F

37. The general rule is that all conduit entering an explosion proof housing should have a sealed fitting. _____ T _____ F

38. A simple rule to remember is that electrical equipment which could become energized if there were an insulation failure should be grounded if it can be contacted by an employee who would be part of the path to ground. _____ T _____ F

39. OSHA requires the use of grounded extension cords. ____ T ____ F
40. OSHA requires that switches, circuit breakers, or other disconnects for a motor, electrical feeder or other electrical equipment be legibly marked. ____ T ____ F
41. Electrical equipment or motor driven equipment should be shut down and _____ before mechanical work is done on it.
42. The minimum safe distance that a crane or its load should be from exposed power lines is _____ feet. Even greater distances are required where the line voltage exceeds 50,000 volts.
43. A simple but important rule to remember is: only _____ employees should do skilled electrical work.
44. There are more OSHA citations issued for machine guarding violations than any other category of violations. ____ T ____ F
45. More of the OSHA citations involving machine guarding are classed as (de minimis/non-serious/serious/imminent danger) than in any other category of violations.
- (2) 46. OSHA requires that "points of operation" and "in-going nip points" be guarded.
- (a) Only enclosure guards are acceptable by OSHA for guarding points of operation. ____ T ____ F
- (b) The most common type of guard used to protect against in-going nip points is the enclosure guard. ____ T ____ F
- (2) 47. From the standpoint of machine guarding, a supervisor has a two-fold responsibility. These are:
- (a) _____
- _____
- (b) _____
- _____

48. The main reasons for requiring compressed gas cylinders to be secured and stored in a vertical position are: 1) its valve is less likely to be broken off. 2) If it is broken, the thrust would be downward and the cylinder would be less likely to act like a missile and 3) cylinders have a safety relief device in the valve assembly - in the vertical position it would release gas rather than a liquid which would vaporize into a much larger volume of gas. ____ T ____ F.
49. Compressed air used for cleaning purposes must be less than ____ PSI at the nozzle.
50. As a supervisor you are a key man in making certain we are in compliance with OSHA. If an OSHA Compliance Officer sees an employee violating the OSHA Act, for instance, by not using a guard on a table saw or by using an air hose for cleaning with line pressure on it, or by not wearing safety glasses or by handling a compressed gas cylinder with an electro-magnet, the company gets the citation rather than the employee. ____ T ____ F.
51. As a supervisor your eyesight, your hearing, your sense of smell and your _____ can be important tools in detecting possible industrial hygiene problems.
- (9) 52. An example of one troublemaker is given below. Name the other nine you were told about in this segment.
- | | |
|--------------------------|-----------|
| (a) <u>HEAT AND COLD</u> | (f) _____ |
| (b) _____ | (g) _____ |
| (c) _____ | (h) _____ |
| (d) _____ | (i) _____ |
| (e) _____ | (j) _____ |
53. All of the troublemakers except noise are contacted either by breathing them, by absorbing them through the skin or by ingesting them along with something we eat, drink or smoke. ____ T ____ F.
54. The most frequent means by which employees in a Refinery or Chemical Plant are exposed to toxic materials is by absorption/breathing/ingestion.

- (2) 55. Normally the skin acts as a barrier to protect your internal organs from harmful substances; however, some materials used in refining operations can pass directly through the skin and be absorbed into the body. Name two of these discussed in the Workbook exercise.
- (a) _____
- (b) _____
56. The possibility of _____ materials in the atmosphere must be considered when selecting a location for employees to eat or prepare food.
57. Of the list of peculiarities associated with industrial diseases (slow to develop, latent or dormant, similar symptoms, plain hard to recognize, irreversible) the most significant is that industrial diseases are irreversible. _____ T _____ F
58. As a supervisor you should do everything you can to _____ employees from getting occupational diseases in the first place.
59. The Occupational Safety and Health Act makes it the employer's responsibility to inform his employees of toxic materials or hazardous conditions in the employee's work area. The supervisor has a responsibility to see that this is done. _____ T _____ F
- (9) 60. List the "Big Ten Bad Actors" plus any additional ones your instructor told you about which are unique to your plant.
- | | | |
|--------------|----------|-----------|
| (a) _____ | ASBESTOS | (f) _____ |
| (b) _____ | | (g) _____ |
| (c) _____ | | (h) _____ |
| (d) _____ | | (i) _____ |
| (e) _____ | | (j) _____ |
| Others _____ | | |
61. A good rule of thumb is that if you can see dust particles in the air from asbestos bearing materials you most likely are exceeding the TLV and protective equipment should be worn until an exact determination of the asbestos fiber level can be made. _____ T _____ F

62. The typical symptoms of lead poisoning are gastro-intestinal disorders, anemia, weakness and even _____.
63. When cadmium welding and brazing rods are used or cadmium plated bolts and nuts are "cut" with a burning torch, the vapors given off are toxic enough to kill you in a short period of time unless proper precautions are taken. _____ T _____ F
- (2) 64. A simple test for cadmium plated materials is to gently heat a spot the size of a nickel with a burning torch. On cadmium plated materials the spot will form a _____ film while cooling while zinc coated materials will turn a _____ color. Limit the test to a few seconds to prevent over-exposure to cadmium fumes.
65. Exposure to excessive levels of benzene can affect the bone marrow resulting in anemia or absence of certain types of blood cells. The condition is irreversible. _____ T _____ F
66. Everyone knows that being sprayed or splashed with sulfuric acid can cause extremely painful chemical burns or loss of eyesight. Chronic exposure to sulfuric acid mist above the accepted working level can cause continuous irritation of the throat, sinuses and eyes as well as a chronic cough. _____ T _____ F
67. Phenol is highly toxic by way of ingestion, by inhaling and by _____ through the skin.
68. Another name for phenol is _____ acid.
69. Only process streams which have a high percentage of phenol are a safety problem. _____ T _____ F
70. Many employees do not realize that a phenol accident can cause death unless proper steps are taken immediately. _____ T _____ F
71. Hydrogen sulfide has a characteristic odor of _____ at very low concentrations. (1/10th part per million)

72. The ability to smell hydrogen sulfide's characteristic odor is lost at levels above 100 PPM. This can easily mislead an employee into thinking he is out of danger when actually the concentration could be increasing. _____ T _____ F
73. _____ is a greenish, yellow gas with a pungent suffocating odor. It can cause severe damage to the lungs and eyes at concentrations as low as a few hundred parts per million.
74. _____ is a colorless, odorless gas formed from the incomplete combustion of carbonaceous materials such as hydrocarbons, wood, and coal.
75. Symptoms of poisoning from the above mentioned gas (#74) are headache, nausea, drowsiness and eventual loss of consciousness. _____ T _____ F
76. Extremely loud noises or a high noise level over an extended period of time can result in permanent _____.
- (2) 77. Early symptoms of exposure to excessive noise levels are _____ or _____.
78. Ear protection should be worn or time of exposure should be limited to the periods specified by OSHA where noise level exceeds 90 decibels (commonly referred to as 90dBA). _____ T _____ F
79. An important part of your job as an Exxon supervisor is to be alert for industrial safety and health problems, know what to do about them, set a good example for your employees and _____

OSHA, EXXON AND YOU

BR 102

<u>Max. Score</u>	<u>Question No.</u>	
	1.	<u>Occupational Safety and Health Administration</u> <u>or Act</u> (either Administration or Act is OK)
	2.	<u>True</u>
	3.	<u>Interstate Commerce</u>
	4.	<u>General Duty</u>
	5.	<u>False</u>
	6.	<u>True</u>
(2)	7.	a. <u>American National Standards Institute (ANSI)</u> b. <u>National Fire Protection Association (NFPA)</u> • National Electrical Code (NEC) is also an acceptable answer.
(4)	8.	<u>3</u> Target Industry - <u>4</u> Random selection <u>1</u> An accident - - - <u>2</u> Employee complaint
	9.	<u>True</u>
(2)	10.	<u>Employees</u> <u>Employer</u>
(4)	11.	a. <u>True</u> c. <u>False</u> b. <u>False</u> d. <u>True</u>

<u>Max. Score</u>	<u>Question No.</u>	
	12.	<u>False</u> - Whichever is longer
(3)	13.	a. <u>True</u> b. <u>True</u> c. <u>False</u>
	14.	<u>True</u>
	15.	<u>False</u>
(2)	16.	<u>standard handrail or someone in constant attendance</u>
	17.	four (4)
	18.	<u>Handrails</u>
(3)	19.	<u>distinctive</u> <u>internally or externally</u>
(4)	20.	<u>accessible</u> <u>inplace</u> <u>damaged</u> <u>discharged</u>
	21.	<u>five (5)</u>
(2)	22.	<u>four (4)</u> <u>25</u>
	23.	<u>two (2)</u>
(6)	24.	a. <u>Good foundation or footing</u> b. <u>Sound scaffold material</u> c. <u>Solidly decked work platform</u> d. <u>Boards overlap supports 6" - 18"</u> e. <u>Uprights plumb</u> f. <u>Uprights braced</u> <u>Guardrail and toeboard when platform above 10'</u> <u>Ladder or equivalent safe access</u>

<u>Max. Score</u>	<u>Question No.</u>		
(2)	25.	<u>8</u>	<u>5</u>
	26.	<u>True</u>	
	27.	<u>True</u>	
(3)	28.	Class I <u>c</u>	
		Class II <u>a</u>	
		Class III <u>d</u>	
	29.	Division I	
	30.	<u>An area located far enough away from a source of hydrocarbon where only in rare instances would there be a flammable atmosphere.</u>	
	31.	<u>Class I</u> <u>Division II</u> <u>Group D</u>	
	33.	<u>False</u>	
	34.	<u>the equipment is designed so that it doesn't have switches or surfaces hot enough to ignite a flammable mixture</u>	
	35.	<u>False</u>	
	36.	<u>False</u>	
	37.	<u>True</u>	
	38.	<u>True</u>	
	39.	<u>True</u>	
	40.	<u>True</u>	
	41.	<u>Tagged out or locked out depending upon the practice at the facility.</u>	
	42.	<u>ten (10)</u>	

Max. Score	Question No.
---------------	-----------------

	43.	<u>qualified</u>
--	-----	------------------

	44.	<u>True</u>
--	-----	-------------

	45.	<u>serious</u>
--	-----	----------------

(2)	46.	(a) <u>False</u>
-----	-----	------------------

		(b) <u>True</u>
--	--	-----------------

(2)	47.	(a) <u>Be certain his machines are properly guarded</u>
-----	-----	---

		(b) <u>Be certain his employees use the guards</u>
--	--	--

	48.	<u>True</u>
--	-----	-------------

	49.	<u>30</u>
--	-----	-----------

	50.	<u>True</u>
--	-----	-------------

	51.	<u>common sense</u>
--	-----	---------------------

(9)	52.	(a) <u>Heat and Cold (Given)</u>	(f) <u>Fumes</u>
-----	-----	----------------------------------	------------------

		(b) <u>Noise</u>	(g) <u>Mists</u>
--	--	------------------	------------------

		(c) <u>Vibration</u>	(h) <u>Vapors</u>
--	--	----------------------	-------------------

		(d) <u>Radiation</u>	(i) <u>Gases</u>
--	--	----------------------	------------------

		(e) <u>Dust</u>	(j) <u>Liquids</u>
--	--	-----------------	--------------------

	53.	<u>True</u>
--	-----	-------------

	54.	<u>breathing</u>
--	-----	------------------

(2)	55.	(a) <u>Tetraethyl lead (TEL)</u>
-----	-----	----------------------------------

		(b) <u>Phenol</u>
--	--	-------------------

	56.	<u>toxic or poisonous</u>
--	-----	---------------------------

	57.	<u>True</u>
--	-----	-------------

	58.	<u>prevent</u>
--	-----	----------------

<u>Max.</u> <u>Score</u>	<u>Question</u> <u>No.</u>
-----------------------------	-------------------------------

59. True

(9)	60.	(a) <u>ASBESTOS (Given)</u>	(f) <u>Phenol</u>
		(b) <u>Cadmium</u>	(g) <u>Hydrogen Sulfide (H₂S)</u>
		(c) <u>Lead</u>	(h) <u>Chlorine</u>
		(d) <u>Benzene</u>	(i) <u>Carbon Monoxide</u>
		(e) <u>Sulfuric Acid</u>	(j) <u>Noise</u>

61. True

62. brain damage

63. true

(2) 64. golden - yellow

smoky - grey

65. True

66. True

67. absorption

68. carbolic

69. False

70. True

71. rotten eggs

72. True

73. Chlorine

74. Carbon monoxide

75. True

76. hearing loss

(2) 77. ringing in ears temporary hearing loss

78. True

79. inform your employees

OSHA, EXXON AND YOU

BR 102

The attached test packet was prepared for a program which utilizes all seven segments of the module. If it is desired to exclude any of the segments, refer to the table below which identifies the questions which apply to each of the segments and the maximum score possible for each segment. Questions which have a value greater than one have their maximum score given in parentheses to the left of the question number.

<u>Segment No. and Title</u>	<u>Questions</u>	<u>Max. Score</u>
Seg. I - What OSHA Is and How it Works	1 - 7	8
Seg. II - OSHA Inspections	8 - 12	12
Seg. III A - Workplace Violations	13 - 25	28
Seg. III B - Electrical Violations	26 - 43	21
Seg. III C - Machine Guarding & Other Violations	44 - 50	9
Seg. IV A - Occupational Disease	51 - 59	18
Seg. IV B - Specific Health Hazards	60 - 79	<u>30</u>
Maximum Total Score		<u>126</u>

OSHA, EXXON AND YOU

BR-102

TEST

1. The letters OSHA stand for the _____
and _____.
2. The objective of Congress when it passed OSHA was to assure, so far as possible, every working man and woman in the nation safe and healthful working conditions and to preserve our human resources. True _____.
False _____.
3. All employees whose employer is engaged in business affecting _____ excluding federal, state and local governments are covered by the Act. Also excluded are those employees who are covered by similar governmental programs already in effect such as the Federal Coal Mine Act and the Atomic Energy Act.
4. OSHA lists two employer responsibilities:
 - To furnish each of his employees working conditions that are free from recognized safety and health hazards that are causing or likely to cause death or serious physical harm.
 - To comply with the specific safety and health standards which have been made law.

The first responsibility as given above is frequently referred to as the _____ Clause.

5. OSHA requires that a citation be issued to either the employer; the employee, or both the employer and employee for violations of the Act depending upon who is at fault. ____ T ____ F.
6. OSHA will permit individual states to develop and administer their own safety and health standards and to establish their own inspection force as long as the state's program is as effective as OSHA's - True _____. False _____.
- (2) 7. The initial safety standards made into law by OSHA were primarily adopted from two national standards organizations. Name these organizations.
- a. _____
- b. _____
- (4) 8. OSHA has established a priority system to decide which businesses to inspect. The factors considered are listed below but not in order of importance. Arrange the factors in order of decreasing importance by placing the appropriate number to the left of the factor with 1 being the most important.
- _____ Target Industry - Those industries with poor accident and health records such as lumber and wood products, roofing and sheet metal, mobile home manufacturing, longshoring, industries with high and repeated exposure to harmful materials such as asbestos, cotton dust, silica, lead, carbon monoxide.
- _____ Random selection
- _____ An accident or industrial disease which involved a fatality or requires the hospitalization of 5 or more persons.
- _____ Employee complaint of an OSHA violation.

9. OSHA permits an employee who has submitted a complaint of an OSHA violation to have his name withheld from the employer. Further the law protects an employee submitting a complaint from any act of reprisal due to his submitting a complaint.

True _____. False _____.

- (2) 10. The OSHA Compliance Officer will normally have two representatives accompany him when he makes his inspection. Who do these individuals represent? _____

- (4) 11. Under imminent danger conditions an OSHA Compliance Officer will do the following:

True False

- a. ____ ____ Notify the employer of the conditions and attempt to convince him to move his employees until the problem is corrected.
- b. ____ ____ Order the employer to shut down the operation and remove his employees until the danger is eliminated.
- c. ____ ____ Notify the employees of the charges and order them to clear the above site until the danger is eliminated
- d. ____ ____ Notify his Area Director of the condition and if the Area Director agrees, the Area Director will request the U. S. District Court having jurisdiction to issue a restraining order shutting down the equipment or condition which created the problem.

12. A citation for a violation of OSHA must be posted at the location where the violation exists for a period of three days or until the violation is eliminated whichever is shorter. ____ T ____ F

- (3) 13. OSHA Compliance Officers concentrate on violations of standards involving poor housekeeping, open-sided floors, and stairway handrails because:

- a. ____ T ____ F Violations of these standards lead to falls which can seriously injure employees.
- b. ____ T ____ F These violations are easy to spot.
- c. ____ T ____ F The President made these areas target areas in his speech announcing the new law.

14. Good housekeeping is an important part of both Process and Mechanical's job if a safe workplace is to be maintained. ____ T ____ F
15. Fixed ladders which are over 20' in height do not require the entrance to be protected if the ladder is equipped with a cage. ____ T ____ F
- (2) 16. Temporary floor openings should be protected by either a _____ or _____.
17. Open-sided floors, platforms and runways require standard handrails if they are _____ feet or more above grade or other working surface.
18. _____ are required for stairs with 4 or more risers.
- (3) 19. Exit signs must be readily visible, with letters at least 6 inches high, of a color _____ from its background and be lighted either _____ or _____.
- (4) 20. Fire extinguishers should be _____ and conspicuous. They should be inspected monthly as a minimum to see that they are _____, have not been _____ or _____.
21. Shoring or sloping of trenches and excavations will normally be required if the excavation is _____ or more feet deep.
- (2) 22. A ladder or equivalent safe access is required if the trench or excavation is _____ feet or more deep. This should be no more than _____ feet from the people working in the excavation.
23. Excavated material or other materials, like piping, boards, etc., should be placed no closer than _____ feet from the edge of the excavation if people will be working within the excavation.

- (6) 24. The basis for the scaffold standard is that it is important to provide the employee with a good surface to work from. If the work can't be reached from the ground or some other solid surface, a sturdy ladder or good scaffold should be provided. Name six of the eight factors pointed out in this segment which are required for a good scaffold.

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____

- (2) 25. The horses for a light duty scaffold (25#/Sq. Ft.) should be no more than _____ feet apart. For a medium scaffold (50#/Sq. Ft.) they should be no farther than _____ feet apart.

26. OSHA adopted the entire National Electrical Code, NFPA 70-1971 and made it applicable to all new installations and every major revamp made after March 15, 1972. _____ T _____ F

27. Electrical classification of unit areas, building, shops, etc., are made in order to assure that electrical equipment purchased for or used in the area will not cause a fire or explosion. _____ T _____ F

- (3) 28. The first thing which an electrical engineer must establish when classifying an area is the type of combustible or flammable material in the atmosphere. For the three classes given below select the correct answers from the column on the right and put the appropriate letter in the blank.

Class I _____	a. Combustible dusts of coal, coke, metals, etc.
Class II _____	b. Coal, coke, wood chips, paper
Class III _____	c. Hydrocarbon vapors and gases
	d. Lint or flyings from cloth.

29. An area which would normally contain an air/vapor mixture which was in its flammable range would be classed as (Division I/Division II)?

30. In simple terms define what is meant by an unclassified or general purpose area classification.

31. Most areas on a typical Refinery or Chemical plant operating unit would normally have what area classification? _____

- (2) 32. Electrical equipment, battery powered instruments, electric tools purchased for use in Unclassified Areas should not be used in _____ or _____ areas without a hot work permit or modification of the equipment or special approval by the safety department.

33. Low voltage, battery powered instruments, tools or communication equipment do not have sufficient energy to "set off" a fire or explosion. _____ T _____ F

34. Intrinsically safe on the label of a piece of electrical equipment means in simple terms _____

35. Mercury vapor light fixtures can be interchanged for incandescent light fixtures because a mercury vapor light will operate cooler than an incandescent light of the same wattage. _____ T _____ F

36. Since explosion proof housings are designed with a 4 to 1 safety factor up to 25% of the cover bolts or 25% of the effective thread area can be left out or disengaged with no real loss of effectiveness. _____ T _____ F

37. The general rule is that all conduit entering an explosion proof housing should have a sealed fitting. _____ T _____ F

38. A simple rule to remember is that electrical equipment which could become energized if there were an insulation failure should be grounded if it can be contacted by an employee who would be part of the path to ground.

_____ T _____ F

39. OSHA requires the use of grounded extension cords. ☐ T ☐ F
40. OSHA requires that switches, circuit breakers, or other disconnects for a motor, electrical feeder or other electrical equipment be legibly marked. ☐ T ☐ F
41. Electrical equipment or motor driven equipment should be shut down and _____ before mechanical work is done on it.
42. The minimum safe distance that a crane or its load should be from exposed power lines is _____ feet. Even greater distances are required where the line voltage exceeds 50,000 volts.
43. A simple but important rule to remember is: only _____ employees should do skilled electrical work.
44. There are more OSHA citations issued for machine guarding violations than any other category of violations. ☐ T ☐ F
45. More of the OSHA citations involving machine guarding are classed as (de minimis/non-serious/serious/imminent danger) than in any other category of violations.
- (2) 46. OSHA requires that "points of operation" and "in-going nip points" be guarded.
- (a) Only enclosure guards are acceptable by OSHA for guarding points of operation. ☐ T ☐ F
- (b) The most common type of guard used to protect against in-going nip points is the enclosure guard. ☐ T ☐ F
- (2) 47. From the standpoint of machine guarding, a supervisor has a two-fold responsibility. These are:
- (a) _____
- _____
- (b) _____
- _____

48. The main reasons for requiring compressed gas cylinders to be secured and stored in a vertical position are: 1) its valve is less likely to be broken off. 2) If it is broken, the thrust would be downward and the cylinder would be less likely to act like a missile and 3) cylinders have a safety relief device in the valve assembly - in the vertical position it would release gas rather than a liquid which would vaporize into a much larger volume of gas. ____ T ____ F.
49. Compressed air used for cleaning purposes must be less than ____ PSI at the nozzle.
50. As a supervisor you are a key man in making certain we are in compliance with OSHA. If an OSHA Compliance Officer sees an employee violating the OSHA Act, for instance, by not using a guard on a table saw or by using an air hose for cleaning with line pressure on it, or by not wearing safety glasses or by handling a compressed gas cylinder with an electro-magnet, the company gets the citation rather than the employee. ____ T ____ F.
51. As a supervisor your eyesight, your hearing, your sense of smell and your _____ can be important tools in detecting possible industrial hygiene problems.
- (9) 52. An example of one troublemaker is given below. Name the other nine you were told about in this segment.
- | | |
|--------------------------|-----------|
| (a) <u>HEAT AND COLD</u> | (f) _____ |
| (b) _____ | (g) _____ |
| (c) _____ | (h) _____ |
| (d) _____ | (i) _____ |
| (e) _____ | (j) _____ |
53. All of the troublemakers except noise are contacted either by breathing them, by absorbing them through the skin or by ingesting them along with something we eat, drink or smoke. ____ T ____ F.
54. The most frequent means by which employees in a Refinery or Chemical Plant are exposed to toxic materials is by absorption/breathing/ingestion.

- (2) 55. Normally the skin acts as a barrier to protect your internal organs from harmful substances; however, some materials used in refining operations can pass directly through the skin and be absorbed into the body. Name two of these discussed in the Workbook exercise.
- (a) _____
- (b) _____
56. The possibility of _____ materials in the atmosphere must be considered when selecting a location for employees to eat or prepare food.
57. Of the list of peculiarities associated with industrial diseases (slow to develop, latent or dormant, similar symptoms, plain hard to recognize, irreversible) the most significant is that industrial diseases are irreversible. _____ T _____ F
58. As a supervisor you should do everything you can to _____ employees from getting occupational diseases in the first place.
59. The Occupational Safety and Health Act makes it the employer's responsibility to inform his employees of toxic materials or hazardous conditions in the employee's work area. The supervisor has a responsibility to see that this is done. _____ T _____ F
- (9) 60. List the "Big Ten Bad Actors" plus any additional ones your instructor told you about which are unique to your plant.

- | | | |
|-----------|----------|-----------|
| (a) _____ | ASBESTOS | (f) _____ |
| (b) _____ | | (g) _____ |
| (c) _____ | | (h) _____ |
| (d) _____ | | (i) _____ |
| (e) _____ | | (j) _____ |

Others _____

61. A good rule of thumb is that if you can see dust particles in the air from asbestos bearing materials you most likely are exceeding the TLV and protective equipment should be worn until an exact determination of the asbestos fiber level can be made. _____ T _____ F

62. The typical symptoms of lead poisoning are gastro-intestinal disorders, anemia, weakness and even _____.
63. When cadmium welding and brazing rods are used or cadmium plated bolts and nuts are "cut" with a burning torch, the vapors given off are toxic enough to kill you in a short period of time unless proper precautions are taken. _____ T _____ F
- (2) 64. A simple test for cadmium plated materials is to gently heat a spot the size of a nickel with a burning torch. On cadmium plated materials the spot will form a _____ film while cooling while zinc coated materials will turn a _____ color. Limit the test to a few seconds to prevent over-exposure to cadmium fumes.
65. Exposure to excessive levels of benzene can affect the bone marrow resulting in anemia or absence of certain types of blood cells. The condition is irreversible. _____ T _____ F
66. Everyone knows that being sprayed or splashed with sulfuric acid can cause extremely painful chemical burns or loss of eyesight. Chronic exposure to sulfuric acid mist above the accepted working level can cause continuous irritation of the throat, sinuses and eyes as well as a chronic cough. _____ T _____ F
67. Phenol is highly toxic by way of ingestion, by inhaling and by _____ through the skin.
68. Another name for phenol is _____ acid.
69. Only process streams which have a high percentage of phenol are a safety problem. _____ T _____ F
70. Many employees do not realize that a phenol accident can cause death unless proper steps are taken immediately. _____ T _____ F
71. Hydrogen sulfide has a characteristic odor of _____ at very low concentrations. (1/10th part per million)

72. The ability to smell hydrogen sulfide's characteristic odor is lost at levels above 100 PPM. This can easily mislead an employee into thinking he is out of danger when actually the concentration could be increasing.
_____ T _____ F
73. _____ is a greenish, yellow gas with a pungent suffocating odor. It can cause severe damage to the lungs and eyes at concentrations as low as a few hundred parts per million.
74. _____ is a colorless, odorless gas formed from the incomplete combustion of carbonaceous materials such as hydrocarbons, wood, and coal.
75. Symptoms of poisoning from the above mentioned gas (#74) are headache, nausea, drowsiness and eventual loss of consciousness. _____ T _____ F
76. Extremely loud noises or a high noise level over an extended period of time can result in permanent _____.
- (2) 77. Early symptoms of exposure to excessive noise levels are _____ or _____.
78. Ear protection should be worn or time of exposure should be limited to the periods specified by OSHA where noise level exceeds 90 decibels (commonly referred to as 90dBA). _____ T _____ F
79. An important part of your job as an Exxon supervisor is to be alert for industrial safety and health problems, know what to do about them, set a good example for your employees and _____

~~Tom Warren~~

Reels 8473

✓ asbestos (5)

(lead)

✓ ~~cadmium~~ - bolt
benzene

✓ phenol

✓ H_2SO_4

✓ H_2S

- sampling
picture of safety std.
man hole -

✓ chlorine

gas cylinders
safety std

✓ CO ✓

(misc)

ear muffs

BIG 10 HEALTH HAZARDS - potential slides

I asbestos

- bad insulation
- asbestos on ground ✓
- plastic bags
- picture of asbestos SOP (Safety Standard #161)

II lead

- ~~lead burning area~~
- ~~food / smoking in area~~
- ~~cooling coils~~
- housepaint
- baby crib

III cadmium

- bolt

IV benzene

- Drawing sample - check w/ detector tube
could generate discussion on need for monitoring
+ exposure, consideration of benzene in stream, etc

V H₂SO₄

- drawing of vessels containing H₂SO₄

VI phenol

- very little exposure?

VII H₂S

- monitoring (Drago tube) man hole for H₂S before entry
- picture of safety std.

VIII chlorine

- gas inflow - SOP
- w/ signs

IX CO

- forklift truck operating inside truck-trailer or baycar

X NOISE - car snuffs w/ impact wrench

XI OTHER

- ~~welding respirator~~
- ~~TYVEK suit at 52 to pumps~~

SUPERVISORS SAFETY SEMINAR

DRY RUN MARCH 2

START 16 MARCH 3 days/wk for 5 weeks

24 people/session (4 tables of six people)

SLIDES TO BE SHOWN CONCURRENTLY

infects

- unsaturated (2)

Food -

reduction

←→

benzene

H₂O₄

phosphor

H₂S

chlorine

CO

NO₂

Box car loading 2/5/75 Draeger tube
residual conc. in boxcar ~ 10 ppm
integrated while fork truck
is in car ~ 20 ppm

Rick Ballengee 7451 NO

