Insurance Institute
Canada

CIP PROGRAM
EXAMINATION
December 2003

C36 BUILDING CONSTRUCTION, FIRE PROTECTION AND BASIC HAZARDS

IMPORTANT

The time allowed for this exam is 3 hours.

Total marks: 200

You must hand in this paper and any paper used for rough work to the supervisor when you leave the examination room. Failure to do so may result in disqualification.

Section A: Multiple-Choice Questions

Question 1. For the following multiple-choice questions, fill in the circle of the letter that identifies the most correct answer.

Example: Ⓐ Ⓑ ● Ⓓ

DO **NOT** MARK THE ANSWERS ON THESE PAGES.

USE THE **FIRST PAGE** OF YOUR ANSWER BOOK.

1. Which of the following constructions has the best fire resistance rating?

(A) Heavy timber floor
(B) Wood joist floor
(C) Plank on exposed steel joists
(D) Precast concrete on steel beams

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2. A building consisting of brick-veneer supported by wood-frame walls and flooring would be classified as

(A) non-combustible construction.
(B) ordinary construction.
(C) wood frame construction.
(D) fire-resistive construction.

3. Which of the following is true of foam plastics?

(A) They are easily damaged by heat.
(B) They are expensive to manufacture and purchase.
(C) They give off non-toxic gases when they burn.
(D) They produce four times the amount of heat during combustion than wood.

4. Surface burning characteristics of any material are measured in the

(A) Panel furnace.
(B) Steiner tunnel.
(C) Floor furnace.
(D) Fire Hazard meter.

5. A material described as having "limited combustibility" is one with a flame spread less than or equal to

(A) 10.
(B) 25.
(C) 50.
(D) 100.

6. Class C roof coverings

(A) slip from position and posses a flying brand hazard.
(B) are effective against light fire exposures.
(C) are effective against severe fire exposures.
(D) are available only in the "built-up" type.

7. A roof having two slopes on all sides, with the lower slope steeper than the upper one, is called a

(A) gable roof.
(B) gambrel roof.
(C) hip roof.
(D) mansard roof.

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8. Which of the following does NOT meet the requirements of a firewall separating two fire divisions in a wood frame building?

(A) Parapet extending at least three feet above the roof
(B) Two-hour fire resistance rating
(C) Self-supporting, freestanding walls
(D) A T-section around the ends of the firewall

9. A fire door in an exterior wall that is subject to light exposures has a required fire resistance rating of

(A) 20 minutes.
(B) 45 minutes.
(C) 60 minutes.
(D) 120 minutes.

10. Self-closing fire doors

(A) are normally in the closed position and are not permitted to have a hold-open feature.
(B) are normally in the open position and will close only if a fire occurs.
(C) rely on such automatic fire detectors as fusible links.
(D) rely on such automatic fire detectors as magnetic-door closers.

11. Which of the following is used to restrict the heat flow and is designed for use in air-conditioning and ventilation ducts?

(A) Electro-thermal link
(B) Fire damper
(C) Fire stop
(D) Fusible link

12. Most types of coal are subject to spontaneous ignition. The one major exception is

(A) anthracite.
(B) bituminous.
(C) subbituminous.
(D) lignite.

13. A recommended safeguard for outside, aboveground fuel storage tanks less than 2300L (500 gals.) is to

(A) support the tank on non-combustible supports.
(B) have curbing around the tank.
(C) locate the tank not less than 1.5m (5 feet) from adjoining property.
(D) All of the above

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14. Which of the following requirements does NOT apply to gaseous fuel piping installed underground?

(A) Must be protected against corrosion ✓
(B) Must be a minimum of 13 mm (1/2 inches) in diameter
(C) Must pass below foundations or walls – Gas only
(D) Must have water tight seal at entry points of outside walls below grade

15. The combustion control in domestic heating appliances that is used to regulate room temperature is the

(A) excess temperature limit switch.
(B) stack relay switch.
(C) ignition coil.
(D) None of the above

16. One primary safety control used with either oil-fired or gas-fired heating appliances is the

(A) thermostat.
(B) 100 % safety shut off valve.
(C) stack relay switch.
(D) photocell.

17. A Stack Relay switch is used with a(n)

(A) oil-fired heating appliance.
(B) gas-fired heating appliance.
(C) electric heating appliance.
(D) All of the above

18. A photocell installed on an oil-fired furnace detects flames of what colour?

(A) Violet
(B) White
(C) Blue
(D) Yellow

19. Which of the following chimneys or vents can be installed with gas burning appliances?

(A) Factory built chimney
(B) Type B vent
(C) Type BW vent
(D) All of the above

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20. Firestop spacers

(A) allow for the circulation of air that helps to dissipate the heat and therefore prevent ignition of nearby combustible materials. ✗ smokestack.
(B) are located along the inside perimeter of a gas-fired appliance and will shut down the appliance should pilot flame failure occur. ✗ 100% safety shut off valve.
(C) are safety controls responsive directly to flame properties. ✗ stack Relay.
(D) are located in the area where a chimney or vent passes through the floor or ceiling of a building.

21. The plug fuse

(A) consists of a wire enclosed in a ceramic or glass body that fits into clips.
(B) is available in ratings up to 60 amps. ✗
(C) is cylindrical in shape and is screwed into a holder.
(D) will break an electrical circuit if there is a high surge of current through the wires.

22. According to Ohm's Law, what is the electrical current if the voltage is 120 and the resistance is 60 ohms?

$C = \frac{V}{R} = \frac{120}{60}$

(A) 0.5 amps
(B) 2 amps
(C) 20 amps
(D) 50 amps

23. What type of fuse would be used to protect a circuit that has an air conditioner?

(A) Type P
(B) Type S
(C) Type D
(D) Type A

24. What type of fuse is designed to be tamper resistant?

(A) Type T
(B) Type D
(C) Type P
(D) Type S

25. With respect to electrical equipment, a Class III location is hazardous because of the presence of

(A) combustible dusts.
(B) electrically conductive dusts.
(C) flammable gases or vapours.
(D) easily ignitable fibres or flyings.

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26. In a hazardous locations electrical equipment Class I atmosphere, which of the following is NOT found in Group D?

(A) Acetylene – Group A.
(B) Gasoline
(C) Propane
(D) Butane

27. What type of hazardous locations electrical equipment would be recommended for a propane cylinder storage room?

(A) Class I Group D Division 2
(B) Class II Group E Division 2
(C) Class III, Division 1
(D) Class III, Division 2

28. Which of the following is a true statement?

(A) Combustible liquids have a flash point that is lower than that of flammable liquids. ✗
(B) The flash point is a distinctive characteristic of each flammable or combustible liquid.
(C) A combustible liquid has a flash point below 37.8° C (100°F).
(D) The higher the flash point, the easier the ignition and the greater the fire hazard. ✗

29. A flammable liquid has a flash point

(A) equal to or greater than 100°F.
(B) less than 100°F. ✓
(C) greater than 100°C.
(D) equal to the combustible flash point.

30. The minimum temperature required to cause self-sustained combustion without a flame in any material is the

(A) flash point.
(B) fire point.
(C) ignition temperature.
(D) combustion rate.

31. Which of the following extinguishing agents would NOT be effective on a flammable liquid with a specific gravity of 0.75?

(A) Dry chemical
(B) Water ✗ ?
(C) AFFF ?
(D) (B) and (C) ?

continued on next page

32. Which of the following specific gravities represents liquids that are heavier than water?

(A) 0.5
(B) 0.75
(C) 1.0
(D) 1.5

33. What type of flammable liquid storage room has at least one exterior wall?

(A) Inside room
(B) Cutoff room
(C) Blast-proof room
(D) Vault room

34. With respect to gas cylinders used in connection with flame cutting,

(A) empties should be intermixed with other empties and not stored with full containers.
(B) fuel gases and oxygen should be stored together.
(C) vertical use of fuel or oxygen gas may cause liquid gas to issue from the nozzle.
(D) fuel and oxygen cylinders should be stored upright.

35. Which of the following is a true statement?

(A) Saponification refers to the process of turning surface grease into a type of soap that floats on the liquid surface.
(B) Saponification should never be used on deep fat fires.
(C) The products of saponification create a powerful heating effect, thereby reducing the volume of carbon dioxide.
(D) The products of saponification will sink in oil, thereby preventing re-ignition of the grease.

36. The chronologically last, distinct stage of a fire is the

(A) flame stage.
(B) heat stage.
(C) incipient stage.
(D) smouldering stage.

37. Which of the following types of detector is best suited to the incipient stage of a fire?

(A) Infrared
(B) Ionization
(C) Photoelectric
(D) Ultraviolet

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38. Which of the following is NOT considered a type of heat detector?

(A) Pneumatic detector ✓
(B) Fusible link ✓
(C) Rate of rise detector ✓
(D) Ultraviolet detector

39. What stage of fire will activate a typical sprinkler head?

(A) Incipient
(B) Smoldering
(C) Flame
(D) Heat

40. Which of the following does NOT fit into the category of obsolete extinguishers?

(A) Soda acid ✓
(B) Foam ✓
(C) AFFF
(D) Carbon tetrachloride ✓

(2 marks each = 80 marks)

Section B: Narrative Questions

Question 2. (a) Describe the test used to establish the surface burning characteristics of interior finishes and the types of data such testing would produce. Steiner Tunnel. (10 marks)

(b) What would be the purpose of asking for a Roofing Contractor's Certificate with respect to an insulated steel roof deck covering? (10 marks)
To distinguish the class of roof base on the material provided in the certificate.

Question 3. Describe a Class I atmosphere and the characteristics of explosion-proof equipment needed for use in the Class I atmosphere. (20 marks)
- flammable liquid or vapours in the air in quantity suff. enough to produce ignitable
- Not gas tight, flame tight. < flat triad joints. cooling the heat from getting out.
Group A B C D.

Question 4. (a) Identify the maintenance requirements set out in the CSA Standard for Waste Oil Heaters. (10 marks)

(b) With respect to natural gas heating, identify the requirements for piping systems aboveground and within a building. (10 marks)

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Question 5. (a) Many fires are caused by neglect of basic safety procedures in what might otherwise be non-hazardous operations. Comment on the problems posed by smoking, and recommend procedures for reducing or eliminating such problems in a jurisdiction that has no by-laws regarding smoking. (10 marks)

(b) With respect to the grease problem in restaurant kitchens, describe the requirements relating to duct systems. (10 marks)

Question 6. (a) Identify and briefly explain FOUR (4) of the conditions necessary for the successful use of portable fire extinguishers. (8 marks)

(b) Identify and briefly explain the common characteristics of CO_2 and dry chemical extinguishing systems. (7 marks)

(c) Identify and briefly explain the TWO (2) general methods of applying CO_2 or dry chemical to extinguish a fire. (5 marks)

Local App: protect signal hazard/surface, discharge directly to the hazard. breaking the chain.

Total Flooding - totally fill the enclosures with gas., smothering fire in the area.

Section C: Application Question

Question 7. (a) Guard service in loss prevention is often provided for the protection of persons and property. Unfortunately, a few guards have tried to find ways to avoid doing their rounds. The easiest way to do this is to tamper with the clock to make it give false readings. Suggest ONE (1) remedy for each of the following tricks to "beat the clock" :

(i) The guard places two paper record discs in the clock, one on top of the other. This facilitates duplicating the discs and avoiding the rounds the following night.
(ii) The guard only makes one round per night but records all rounds at the same time. This is done by going to any given station, punching the clock, advancing the time on the clock one hour, punching it again, and so on. The guard then repeats the procedure for every other station.
(iii) The guard does not have access to the keys to the clock, and therefore picks the lock.
(iv) Cutting all the key station chains allows the guard to take the keys back to a favourite rest area. By just picking up the right key at the appropriate time and punching the clock, the guard does not even have to get out of a chair.
(v) The guard takes a screwdriver and removes all the screws holding the key stations on the wall. This way, the chains do not have to be cut. (10 marks)

(b) As a loss prevention manager, you are aware that welding is considered a common hazard and a significant source of fire losses. What precautions would you recommend when welding takes place on-site away from the central welding shop area? (10 marks)

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