Introduction to Welding
Gas and Thermal Processes

Review Questions
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Chapter 1 – Oxy-fuel gas plant safety

1. List five (5) items of protective clothing used when thermal cutting.
   1. ____________________________
   2. ____________________________
   3. ____________________________
   4. ____________________________
   5. ____________________________

2. List four (4) major safety hazards associated with thermal cutting.
   1. ____________________________
   2. ____________________________
   3. ____________________________
   4. ____________________________

3. State three (3) ways that you can reduce the risk of fire when using oxy-fuel cutting equipment.
   1. ____________________________
   2. ____________________________
   3. ____________________________

4. To what distance should the work area be cleared to reduce the risk of fire?
   (Tick the correct answer/s)
   - 5 metres
   - 10 metres
   - 7 metres
   - 3 metres
5. Fumes can be generated from thermal cutting. Name two (2) ways of minimising the exposure.
   1. 
   2. 

6. Thermal cutting produces harmful eye damaging rays. Name the two (2) types of rays.
   1. 
   2. 
Chapter 2 – Oxygen-acetylene and propane equipment

1. Cylinders are colour coded. State the colour of the following cylinders.
   • Oxygen
   • Acetylene
   • Industrial-LPG

2. To what pressures are ‘G’ size oxygen cylinders currently filled?

3. What type of thread is used on regulators and fittings for the following cylinders?
   • Oxygen
   • Acetylene
   • LPG

4. Acetylene cylinders are filled with a porous material. What is the purpose of this material?

5. What is the maximum discharge rate of acetylene (as a fraction)?

6. If overheating occurs, what is the safety device fitted to the cylinder to vent off acetylene?
7. State the temperature of the flame produced when burning the following fuel gases with oxygen.
   - Acetylene
   - LPG

8. What is the combustible range of acetylene?

9. State the maximum safe working pressure for acetylene.

10. What could be the result of exceeding the safe working pressure of acetylene?

11. Name two (2) types of gases that can be stored in a bulk liquid form.
    1. 
    2. 

12. Explain why hydrocarbons such as oils and grease should not come in contact with oxygen-fuel gas equipment.

13. How many turns should a cylinder valve be opened? Explain why.

14. Identification labels are fitted to the shoulders of cylinders. As an operator, what should you do if the label is missing?
15. Oxygen regulators are colour coded for safety. Choose the correct colour for oxygen regulators. (Tick the correct answer/s)
   - Claret
   - Black
   - Red
   - Peacock blue

16. State two (2) functions of a gas regulator.
   1. [Blank]
   2. [Blank]

17. Hoses can be joined and connected to regulators and blowpipes. How can this be done?
   [Blank]
   [Blank]

18. Identify the following nozzles.
   - Type 41 [Blank]
   - Type 44 [Blank]

19. Cutting nozzles are identified by markings. What do the following markings indicate?
   [Blank]
   [Blank]

20. How can the thermal cutting plant be checked for leaks prior to use?
   [Blank]
   [Blank]
21. What is the maximum safe working pressure for acetylene?

- Backfire

- Flashback

23. When flashback occurs, which valve do you close off first? (Tick the correct answer/s)

- Oxygen, at the bottles
- Acetylene, torch end
- Oxygen, torch end
- Acetylene, at the bottles
Chapter 3 – Flame heating

1. Heating torches draw large volumes of gas. What needs to be considered when using heating torches?

2. Describe the process of flame straightening.

3. In flame straightening, the temperature of the material should not exceed which of the following?
   • 100 degrees Celsius
   • 400 degrees Celsius
   • 1000 degrees Celsius
   • 600 degrees Celsius

4. Steel needs to be cooled between heats for effective flame straightening. Quenching the material with water can speed up this process, but will this affect the properties of the metal, and what needs to be considered?

5. Flame heating can be used for many applications. Name three (3).
   1. 
   2. 
   3. 
6. You are required to straighten the following flat bar. Mark the correct heating patterns where required.

Fig 3.1 – Flat bar
Chapter 4 – Oxy-fuel gas welding

1. Name two (2) advantages and two (2) limitations of oxy-fuel gas welding.
   - Advantages
     1. 
     2. 
   - Limitations
     1. 
     2. 

2. When cutting 12 mm plate, what size cutting tip is required? State the working pressure that oxygen and acetylene should be set to.
   - Cutting tip 
   - Oxygen 
   - Acetylene 

3. Name the three (3) types of oxy-acetylene flames that can be used when gas welding.
   1. 
   2. 
   3. 

4. Which flame type should be used for the welding of mild steel?

5. In forehand welding, in which direction is the blowpipe facing?

6. Backhand welding is the most commonly used application for what type of work?
7. When braze welding mild steel, a flux is used. State the purpose of the flux.


8. What effects has flux residue on the parent metal? How can these effects be eliminated?


Chapter 5 – Oxy-flame cutting

1. What is the ignition temperature of steel?


2. Describe what is meant by the term ‘kerf width’.


3. What is the purpose of the pre-heat flame?


4. Fill in the missing information below.

   The pre-heat flame should be kept at an approximate distance of __________ mm from the workpiece.

   A heavy duty cutting blowpipe is recommended for material thicknesses greater than __________ mm.

5. To produce high quality cuts, state five (5) factors that need to be observed.
   1. ____________________________
   2. ____________________________
   3. ____________________________
   4. ____________________________
   5. ____________________________
following conditions.

- Top edge rounded
- Excessive slag
- Gouging on the cut face

7. Name two (2) cutting aids that can assist you in producing quality cuts.
   1.
   2.

8. Describe the procedure for piercing a hole.

9. Using the oxy-acetylene cutting process, show the starting point of the cut and the direction of travel on the pipe below.

Fig 5.1 – Direction of travel on pipe
10. In the space below, sketch a universal beam and indicate a suitable cutting sequence.

11. State two (2) methods of minimising distortion, and give a brief description of both methods.
   1. 
   2.
Chapter 6 – Oxy-flame gouging

1. What is the recommended gas pressure for using a 32 GB gouging tip? (Tick the correct answer/s)
   • 100 kPa acetylene – 600 kPa oxygen
   • 100 kPa acetylene – 500 kPa oxygen
   • 100 kPa acetylene – 400 kPa oxygen
   • 100 kPa acetylene – 650 kPa oxygen

2. What decides the size and shape of a gouge? (Tick the correct answer/s)
   • Gas pressure
   • Size of nozzle
   • Operating angle
   • All of the above

3. The oxy-flame gouging process can only be used on metal containing what element?

4. How are flame-gouging nozzles different in design from cutting nozzles? (Tick the correct answer/s)
   • They have a smaller oxygen cutting orifice
   • Their larger number of pre-heat ports
   • The oxygen cutting orifice is larger
   • They have a smaller number of pre-heat ports

5. Give two (2) examples of where gouging can be used.
   1. ........................................................................................................................
   2. ........................................................................................................................
6. A one (1) metre long weld needs to be removed. What gouging technique should be used, and why?

7. State two (2) fuel gases that can be used in the gouging process.
   1. 
   2. 

Chapter 7 – Plasma cutting

1. Briefly explain the following terms.
   - Plasma
   - Ionised

2. Name three (3) major components of the plasma cutting system.
   1. 
   2. 
   3. 

3. From what does the power source for plasma arc cutting come? (Tick the correct answer/s)
   - Transformer
   - Transformer/rectifier
   - Generator
   - Alternator

4. General purpose lightweight cutting uses what type of gas?

5. If compressed air is used, what is the required pressure?

6. Relating to plasma cutting; why should gas lines be purged when left standing overnight?
7. What could be the cause of the tip burning out too quickly?


8. State three (3) materials that are cut using the plasma cutting process.
   1. 
   2. 
   3. 

9. What do plasma arc cutting electrodes operate on? (Tick the correct answer/s)
   • DC negative (-)  • DC positive (+)
   • AC high frequency  • All the above

10. Fumes generated from the plasma cutting process can be toxic. State two (2) ways in which an operator can minimise exposure to these fumes.
    1. 
    2. 

11. State two (2) hazards associated with the plasma cutting process.
    1. 
    2. 

12. What are the electrodes for plasma arc cutting made from? (Tick the correct answer/s)
    • Carbon-graphite  • Tungsten
    • Copper-carbon  • Chromium-titanium
METALS AND FABRICATION
Introduction to Welding
Gas and Thermal Processes

Review Questions

DESCRIPTION
This book contains review questions based on the content of Introduction to Welding – Gas and Thermal Processes, product code ENG092. It can be used as a ‘partner’ to that book, to provide students with the opportunity to review their learning. It may also be used as an assessment tool, enabling students to demonstrate their understanding of introductory arc welding principles including:

• safety
• oxygen-acetylene and propane equipment
• flame heating
• oxy-fuel gas welding
• oxy-flame cutting
• oxy-flame gouging
• plasma cutting.

The book is divided into chapters, to match the chapters in ENG092. For more information about the content covered by Introduction to Welding, please refer to our product catalogue description using its product code; ENG092.

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Metals and Engineering

TRAINING PACKAGE
• MEM05

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• ENG092: Introduction to Welding – Gas and Thermal Processes

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