



Province of the
EASTERN CAPE
EDUCATION

DIRECTORATE SENIOR CURRICULUM MANAGEMENT (SEN-FET)

HOME SCHOOLING SELF-STUDY WORKSHEET

SUBJECT	WELDING & METALWORK	GRADE	11	DATE	JULY 2020
TOPIC	Exam-based Material	TERM 1 -4 REVISION	(√)	TERM CONTENT	()
TIME ALLOCATION	2 hrs.	<u>TIPS TO KEEP HEALTHY</u>			
INSTRUCTIONS	This topic focused study material is intended to assist learners in the various approaches used by examiners.	1. WASH YOUR HANDS thoroughly with soap and water for at least 20 seconds. Alternatively, use hand sanitizer with an alcohol content of at least 60%. 2. PRACTICE SOCIAL DISTANCING – keep a distance of 1m away from other people. 3. PRACTISE GOOD RESPIRATORY HYGIENE: cough or sneeze into your elbow or tissue and dispose of the tissue immediately after use. 4. TRY NOT TO TOUCH YOUR FACE. The virus can be transferred from your hands to your nose, mouth and eyes. It can then enter your body and make you sick. 5. STAY AT HOME.			

QUESTION 1: SAFETY (GENERIC)

1.1 State THREE safety measures to observe when using the arc welding equipment, FIGURE 1.1.



FIGURE 1.1

1.2 Give THREE basic rules that apply to machine guards in the workshop.

1.3 State THREE safety precautions to apply when using a bending press (Box and Pan folder), FIGURE 1.3.



1.4 What does the regulation under the OHS Act (clause C3) refers to in terms of reporting to persons in charge of a workshop?

1.5 Name THREE general safety rules one must adhere to before switching on the portable grinder, FIGURE 1.5.



FIGURE 1.5

1.6 What safety precautions should be adhered to when drilling a flat steel plate on a drill press?

1.7 State THREE safety rules to be observed when using a surface grinder.

1.8 Identify any THREE types of personal protective equipment (PPE) needed when using gas welding equipment.

1.9 Give TWO examples of unsafe conditions in the workshop.

1.10 Name the TWO main categories that the Occupational Health and Safety regulation can be divided into.

QUESTION 2: WELDING TERMINOLOGY (SPECIFIC)

2.1 Make neat sketches of the following templates:

2.1.1 Strip

2.1.2 Flange

2.1.3 Web

2.2 With the aid of sketches, identify the back mark of a 50 x 50 angle iron.

2.3 FIGURE 2.3 below shows half of a simple roof truss that is bolted together.

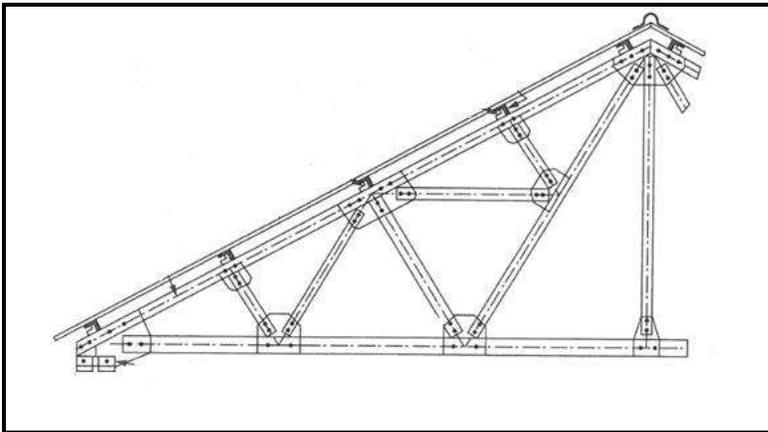


FIGURE 2.3

2.3.1 Identify **A** in the sketch above.

2.4 The span of the roof truss is 12 m and the rise is 2 m. Calculate the:

2.4.1 Rafter of the truss

2.4.2 Rafter angle

2.4.3 Slope

QUESTION 3: TOOLS AND EQUIPMENT (SPECIFIC)

3.1 Name THREE main types of arc welding machines.

.2 Describe how two plates are being put together by means of resistance welding.



3.3 What is back firing with regard to oxy-acetylene welding?

QUESTION 4: FORCES (SPECIFIC)

4.1 A round mild steel bar, 100 mm long, with a diameter of 50 mm, is used in a steel framework. A compressive force of 60 kN is exerted on the bar and shorten by 0,4 mm.

Calculate the following:

4.1.1 The stress in the material and state your answer in mega pascals.

4.1.2 The strain caused by the force.

4.2 FIGURE 4.2 shows a system of forces acting on the same point. Use Bow's notation to construct a space diagram, depicting the lines of action and direction of all the forces in the system.

Use the following scale with Bow's notation: 1 mm = 3 N.

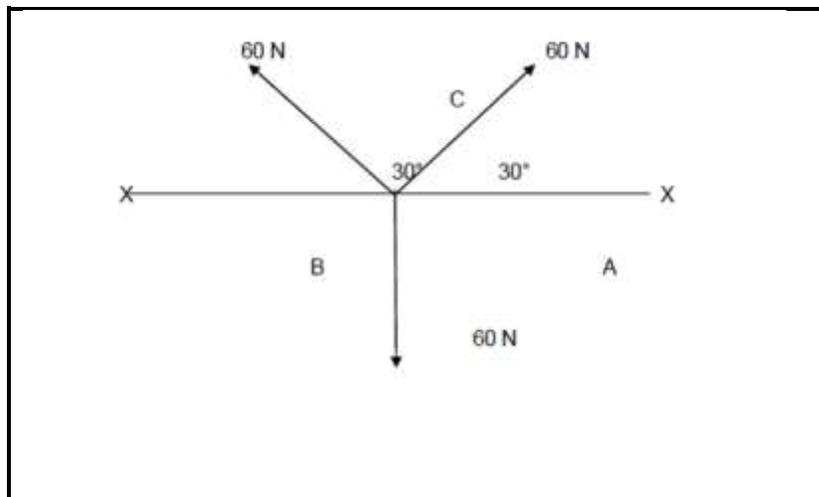


FIGURE 4.2

4.3 The beam in FIGURE 4.3 below is supported at two ends and is subjected to three point loads, 250N and 500N respectively.

Calculate the reactions at the supports R1 and R2.

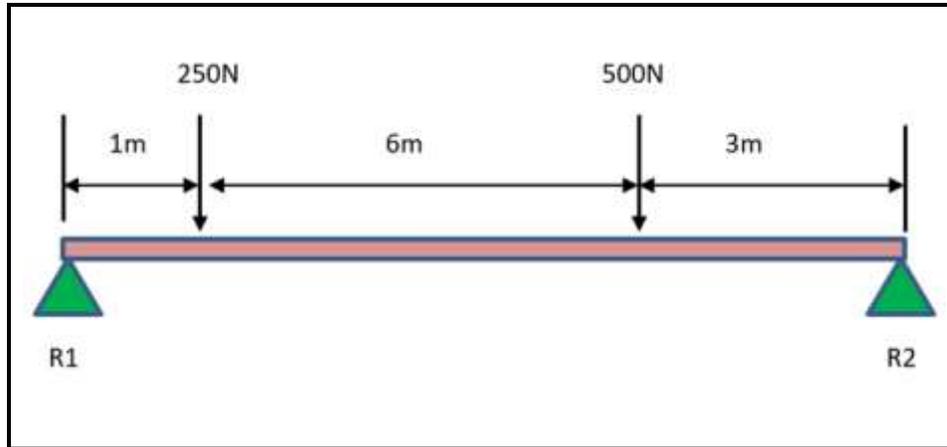


FIGURE 4.3

QUESTION 5: MAINTENANCE (SPECIFIC)

5.1 State an effect caused by the lack of lubrication on a manual guillotine.



5.2 State TWO results of overloading of the punch and sheering machine.

5.3 A well-maintained sheering machine has a longer lifespan, enhances production and reduces cost. State TWO factors that extend the service life of a machine effectively.



QUESTION 6: JOINING METHODS (SPECIFIC)

6.1 FIGURE 6.1 Below shows the heating and cooling curve for steel. Answer the questions that follow.

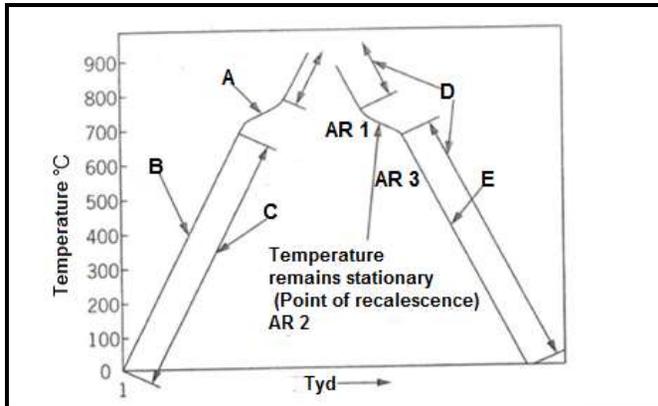


FIGURE 6.1

6.1.1 Label the parts marked A–E.

6.1.2 Mention THREE methods of heat treatment.

6.2 Give the THREE different varieties of carbon steel used in engineering and the carbon content of each.

6.3 Name any arc/gas welding defect.

QUESTION 7: TERMINOLOGY (DEVELOPMENT) (SPECIFIC)

7.1 Develop the right cylindrical Y- connection in FIGURE 7.1 below.

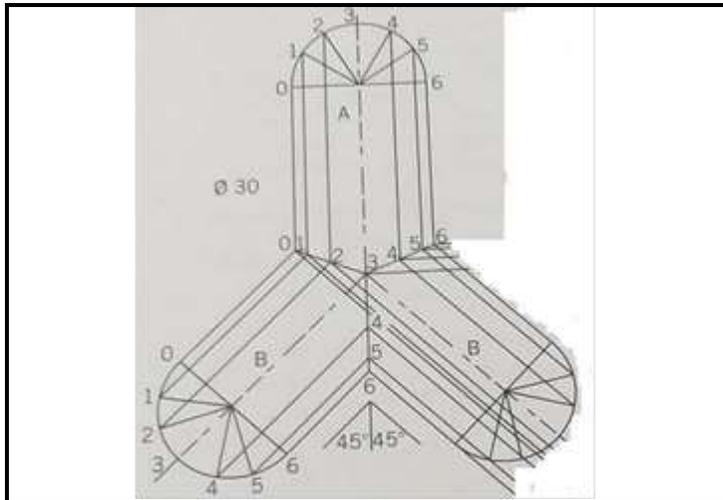


FIGURE 7.1

QUESTION 8: TERMINOLOGY (STEEL SECTIONS) (SPECIFIC)

8.1 Name FOUR different steel sections that are used in structural work.

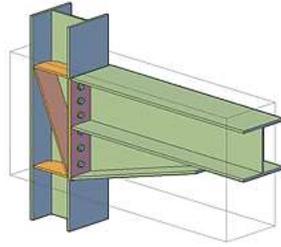
8.2 What is a steelmill?

8.3 What is meant by the term notching?

8.4 Make a neat drawing of a column cap.

8.5 Identify the following types of joints in steel-framed construction.

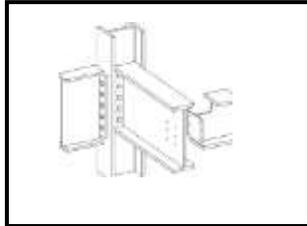
8.5.1



8.5.2



8.5.3



8.6 Identify the machine used in the cutting process below.



8.7 List TWO types of T-joints from steel profiles that can be notched and welded when joining similar or different sections of notching and welding.