

SC 6072/6071
WASSCE 2022
METALWORK 2 & 1
Essay and Objective
2 hours 40 minutes

2&1

Name:.....

Index Number:.....

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination (WASSCE)
for School Candidates

SC 2023

METALWORK 2&1
Essay and Objective

2 hours 30 minutes

Do **not** open this booklet until you are told to do so. While you are waiting read and observe the following instructions. Write your **name** and **index number** in **ink** in the space provided above.

This booklet consists of **two** papers. Answer Paper **2** which comes first. In your answer booklet and Paper **1** on your Objective Test Answer Sheet. Paper **2** will last **2** hours after which the answer booklet will be collected. Do **not** start paper **1** until you are told to do so. Paper **1** will last **40** minutes.

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Answer **all** the questions.

Each question is followed by **four** options lettered **A to D**. Find the **correct** option for **each** question and **shade in pencil** on your answer sheet, the answer space which bears the same letter as the option you have chosen.

Give only **one** answer to **each** question. *An example is given below*

Which of the following parts of the body must be protected when grinding a tool?

- A. Eyes
- B. Hands
- C. Feet
- D. Ears

The correct answer is Eyes, which is lettered A. and therefore answer space A would be

A [B] [C] [D]

Think carefully before you shade the answer spaces; erase completely any answer(s) you wish to change.

Do **all** rough work on this question paper.
Now answer the following questions.

1. Which of the following should be encouraged in a workshop?
 - A. Combustibles on the floor
 - B. Cross ventilation
 - C. Oily floor
 - D. Long bars in vices
2. The appropriate safety wear worn when grinding is
 - A. ear plugs.
 - B. goggles.
 - C. helmet.
 - D. nose mask.
3. A metal which breaks easily when hammered is
 - A brittle.
 - B. ductile.
 - C. malleable.
 - D. soft.
4. Which of the following metals is malleable?
 - A. Brass
 - B. Bronze
 - C. Lead
 - D. Zinc
5. The type of metal suitable for making anvil is
 - A. cast iron.
 - B. mild steel.
 - C. tool steel.
 - D. wrought iron.

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6. The raw material used to produce lead is
- blende.
 - galena
 - pyrite
 - tinstone
7. The instrument used to measure the smallest unit is
- compass.
 - steel rule
 - vernier calliper.
 - micrometer.
8. One of the reason for the breakage of a hacksaw blade is when
- blade teeth point away from the operator.
 - blade is insecurely fixed on the frame
 - three teeth of the blade is in contact with work.
 - blade length is too short.
9. Which of the following tools is used on bushings?
- Flat scraper
 - Triangular file
 - Half-round scraper
 - Square file
10. The practice that ensures smooth operation of a bench vice is to
- rub chalk on threads of the vice.
 - hammer the moving jaw.
 - grease threads of the vice.
 - dismantle the vice always.
11. Heat treatment is earned out to
- melt metals.
 - vapourize metals.
 - alloy steels.
 - harden steels.
12. The process of heating a metal to a critical temperature and cooling in oil immediately is
- annealing.
 - hardening.
 - normalizing.
 - tempering.
13. A suitable equipment used for heat treatment is
- a blacksmith's forge.
 - a blast furnace.
 - a cupola furnace.
 - an electroplating kit.
14. The tempering colour for drills is
- dark straw.
 - dark purple.
 - pale straw.
 - purple

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15. Which of the following tools is used to draw large circles on sheet metals?
- Combination set
 - Compass
 - Dividers
 - Trammel
16. The top and bottom hardie are used
- to cut
 - to break
 - as punch
 - as drift

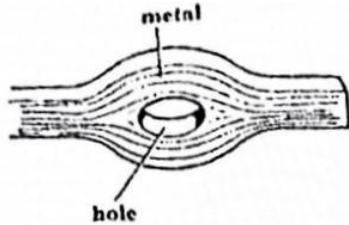


Figure 1

17. The sketch of a forged piece shown in Figure 1 is a
- bored hole.
 - drilled hole.
 - punched hole.
 - reamed hole.
18. Which of the following practices is a safety measure in forge work?
- Alert co-workers before striking hot metals
 - Adjust the fume extractor regulator
 - Prevent smoke from escaping through the chimney
 - Quench workpiece before striking it
19. One merit of casting is to obtain
- bigger shapes than desired.
 - the exact shapes desired.
 - smaller shapes than desired.
 - smooth surface desired.
20. The cope and the drag fastened together to receive molten metal is called
- core.
 - flask.
 - mould.
 - pattern.
21. In pattern making, the reason for tapering edges is to
- enable easy withdrawal.
 - enable easy pouring.
 - obtain smooth surface.
 - obtain final shapes.
22. The casting defect which occurs due to escape of gases from the metal
- inclusion.
 - porosity.
 - scabs.
 - shrinkage.

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SECTION B
THEORY

1½ hours

[60 mark]

Answer **four** questions **only** from this section

Where possible, your answer should be illustrated with freehand sketches
All questions carry equal marks

1. (a) Sketch the following nuts:
(i) castle nut;
(ii) die nut;
(iii) lock nut. [9 marks]
- (b) State **three** suitable materials used for making rivets. [3 marks]
- (c) List **three** faults in riveting. [3 marks]
2. (a) List **two** types of iron ore. [2 marks]
- (b) State **four** steps involved in the production of iron from its ore. [8 marks]
- (c) What is the name of the iron produced in (b)? [1 marks]
- (d) State **one** function **each** of the two constituents used with the ore in the production of iron [4 marks]
3. (a) State **three** safety precautions that should be observed when working on each of the following:
(i) drilling machine;
(ii) lathe machine;
(iii) grinding machine. [9 marks]
- (b) With the aid of sketches, differentiate between a *dot punch* and a *centre punch*. [6 marks]
4. (a) State the use of **each** of the following sheet metalwork tools:
(i) hatchet stake;
(ii) bick iron;
(iii) folding bar. [6 marks]
- (b) Describe *sweating* in relation to soldering. [3 marks]
- (c) Sketch the following oxy-acetylene flames:
(i) neutral;
(ii) oxidizing;
(iii) carburizing [6 marks]
5. (a) What is forging? [2 marks]
- (b) State **one** use of **each** of the following forging equipment and tools
(i) the forge;
(ii) the anvil;
(iii) tongs. [6 marks]
- (c) With the aid of a sketch, explain the process of twisting [7 marks]

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