

Name.....Adm No.....STREAM.....

METALWORK
445/1 PAPER 1
FORM 4
OCT 2022
2½ hours

SCHOOL.....
Sign.....
Date.....

NYAHOKAKIRA CLUSTER THREE EXAMINATION 2022

Kenya Certificate of Secondary Education (K.C.S.E.)



Instructions to Candidates

- (a) Write your name, admission number and class in the spaces provided above.
- (b) Students should have the following for this examination;
Drawing instruments;
Scientific calculator;
Drawing paper.
- (c) This paper consists of **two** sections: **A** and **B**.
- (d) Answer **all** the questions in section **A** in the spaces provided.
- (e) Answer **question 11** on drawing paper and any other **three** questions from section **B** in the spaces provided.
- (f) All dimensions in millimeters unless otherwise stated.
- (g) This paper comprises of **13 printed pages**.
- (h) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.
- (i) Candidates should answer the questions in English.

For Examiners use only

Section	Question	Maximum score	Candidate's Score
A	1 - 10	40	
B	11	15	
	12	15	
	13	15	
	14	15	
	15	15	
Total Score			

SECTION A (40 marks)

Answer ALL questions in this section in the spaces provided.

1. (a) State **FOUR** details which the consumable inventory should contain. **(2marks)**

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- (b) State **FOUR** factors that are used to determine the amount of money needed to start a business. **(2marks)**

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2. (a) State **ONE** disadvantage of using water extinguishers as a fire fighting equipment. **(1mark)**

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- (b) State **FOUR** aspects which are likely to influence an individual's future career. **(2marks)**

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3. (a) Name the type of a metal which is produced by the following furnaces; **(2marks)**

(i) Puddling furnace

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(ii) Cupolla

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(b) Define each of the following properties of metals. **(3marks)**

(i) Elasticity

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(ii) Malleability

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(iii) Ductility

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4. (a) Outline the procedure of reading a micrometer. **(2marks)**

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(b) Outline the procedure of finding the depth of a blind hole using a combination set. **(3marks)**

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5. (a) With the aid of sketches, show TWO methods of turning a taper. **(3marks)**

(b) Give **TWO** reasons why sheetmetal edges are edge-treated. **(1mark)**

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(c) Name **FOUR** types of pattern development used in sheetmetal work. **(2marks)**

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6. (a) State **ONE** effect of each of the following in riveting. **(3marks)**

(i) Drilling the plates separately;

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(ii) Cutting the rivet tail with pliers;

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(iii) Leaving burrs on the drilled hole.

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(b) Give **THREE** functions of flux when brazing. **(1½marks)**

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(c) Give **TWO** advantages of brazing over soft soldering. **(1mark)**

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7. State **FOUR** factors that affect the quality of work in an arc welded joint: **(2marks)**

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8. Give the use of each of the following parts of a lathe machine. **(3marks)**

(i) carriage wheel

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(ii) cross-slide wheel

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(iii) half nut lever

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9. Explain what is meant by the term point of recalescence and the point of decalescence. **(2marks)**

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10. (a) Outline the procedure of painting. **(2marks)**

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(b) List THREE methods of painting. **(1½marks)**

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SECTION B (60 marks)

Answer **question 11** on **A3** paper and any other **three questions** from this section in the spaces provided. Candidates are advised to spend not more than **25 minutes** on this **question 11**.

11. **Figure 1** shows orthographic views of a block drawn in first angle projection.

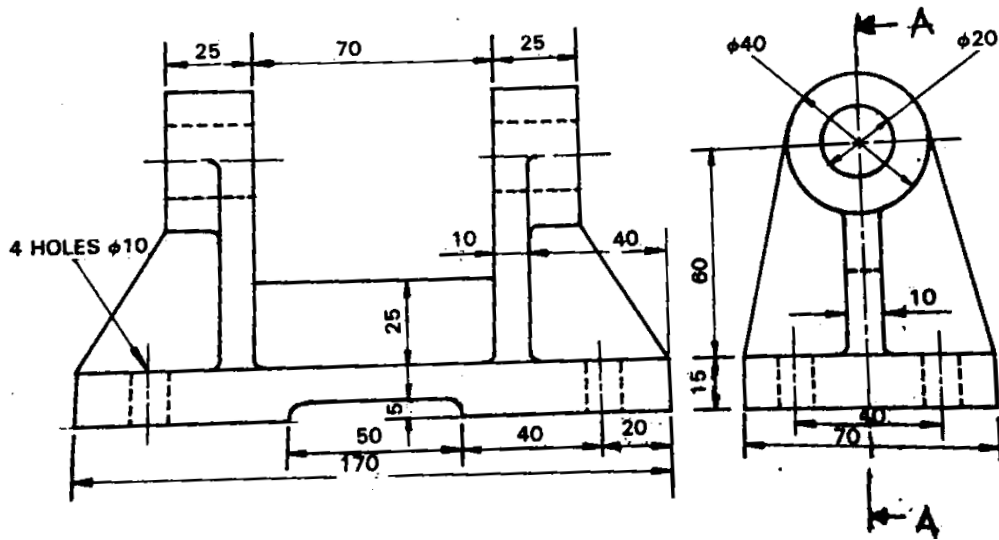


Figure 1

Draw in **FULL SIZE** the following views;

- (i) Sectional front elevation through A-A. (10marks)
- (ii) Plan. (Include hidden details). (5marks)

12. (a) Figure 2 shows the frustrum of a right cone. Draw the surface development of the frustrum when opened on a shorter side. **(15marks)**

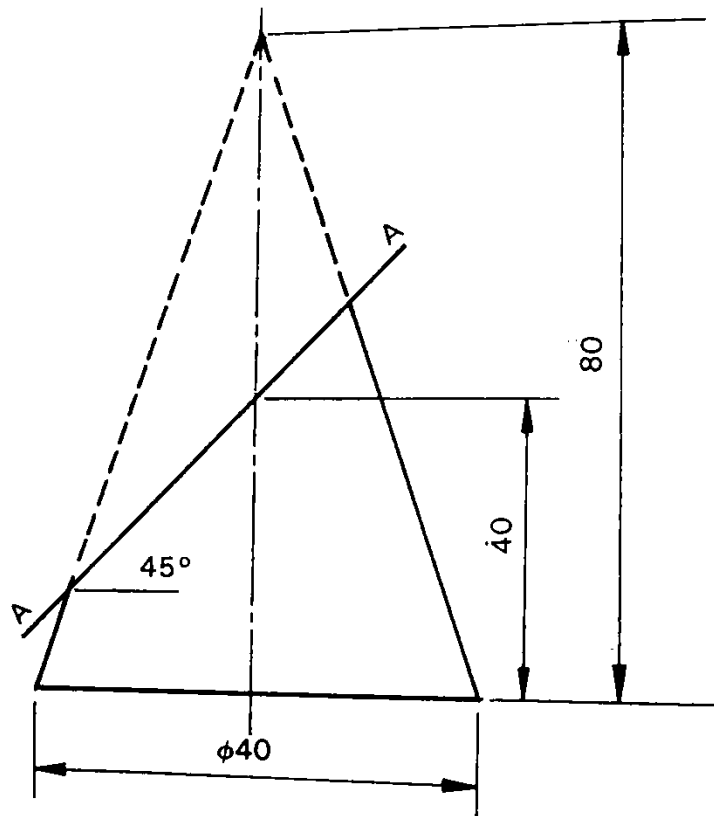


Figure 2

13. **Figure 3** shows a component to be produced on a lathe machine.

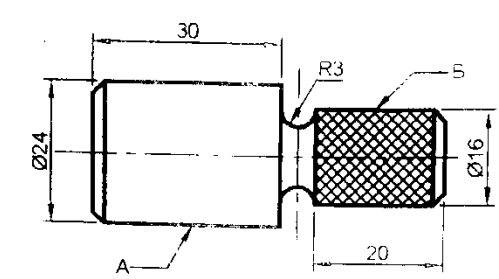


Figure 3

Outline the procedure of producing the component.

(15marks)

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14. (a) Sketch and describe the use of each of the following forging tools.

(6marks)

(i) Fullers

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(ii) Flatters

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(iii) Swages

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(b) With the aid of neat sketches, describe the following forging processes;

(9marks)

(i) Upsetting

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(ii) Drawing down

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(iii) Twisting

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15. (a) With the aid of sketches, describe each of the following methods of arc welding.

(8marks)

(i) Leftward welding

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(ii) Rightward welding

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(b) With the aid of sketches, outline the procedure of locating the centre of a round bar using an odd leg calipers. **(7marks)**

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