Name……..Adm No……..Stream……

METALWORK **School**…….....
445/1
PAPER 1
FORM 4
JULY 2024
2½ hours

NYAHOKAKIRA CLUSTER TWO 2024

Kenya Certificate of Secondary Education

2½ hours

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. ***(2mrks)***

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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.

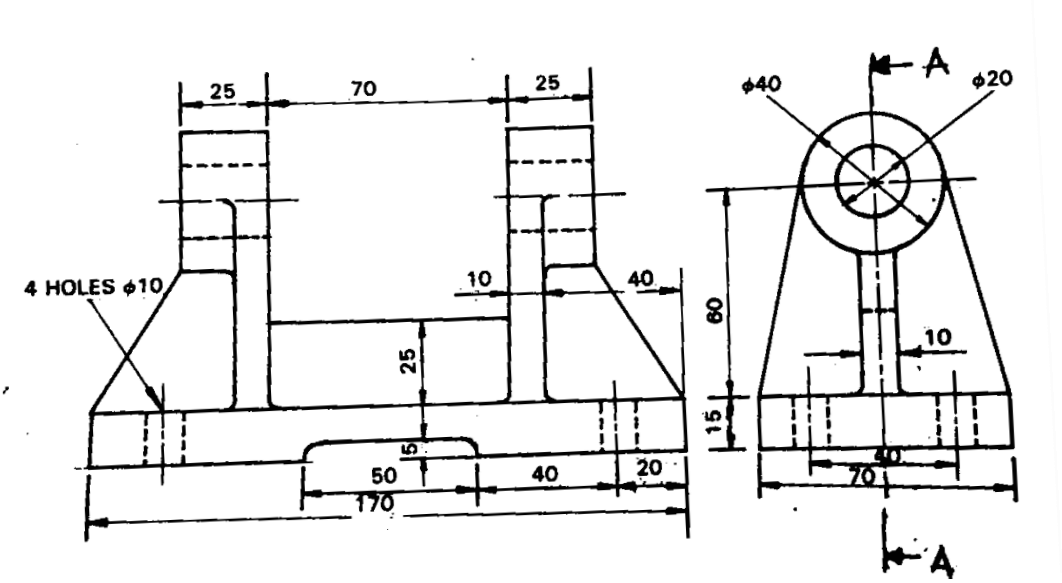

Figure 1

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)***

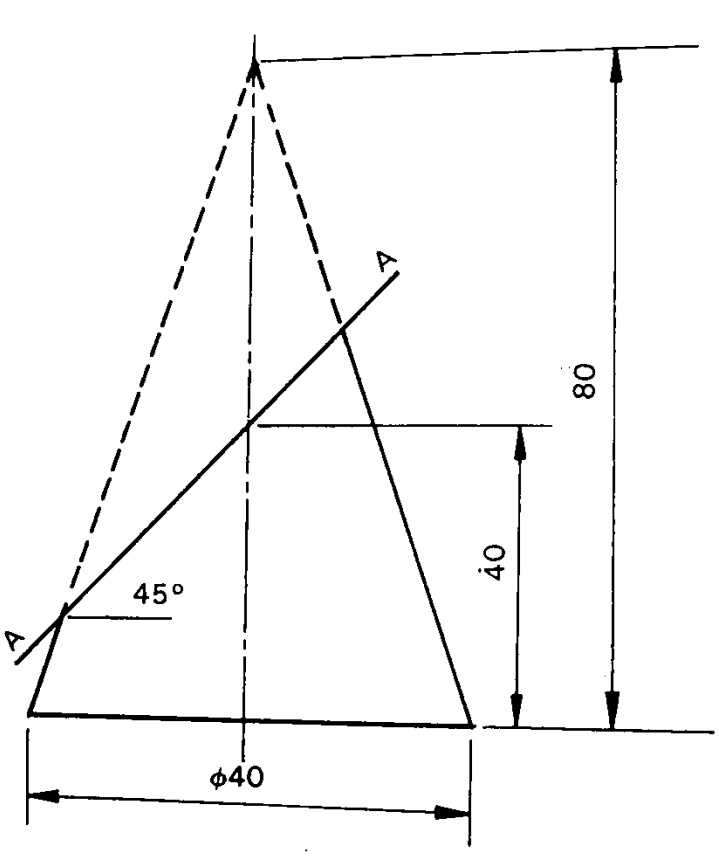

Figure 2

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

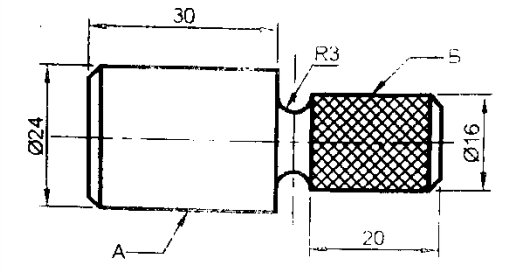

Figure 3

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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