

NAME _____ INDEX _____ ADMN NO. _____

CLASS _____ CANDIDATES SIGNATURE _____ DATE _____

445/1

METALWORK

TIME: 2 HRS 30 MIN

KAMDARA JET

INSTRUCTION TO CANDIDATES

- i. Write your name and index number in the spaces provided
- ii. Sign and write the date of the examination
- iii. Candidates should have the following for this examination drawing instruments
scientific calculator
- iv. This paper consists of two sections A and B
- v. Answer all the questions in sections A
- vi. Answer question 11 and any other three questions in section B in the spaces provided.
- vii. All dimensions are in millimeters unless otherwise stated
- viii. Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing
- ix. Candidates should answer the questions in English

FOR EXAMINERS USE ONLY

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE SCORE
A	1-10	40	
B	11	15	
	12	15	
	13	15	
	14	15	
	15	15	
		TOTAL	

This paper consists of 12 printed pages

SECTION A

a) name two suitable materials for making a hacksaw blade (2 marks)

b) give specifications of a hacksaw blade (3 marks)

2. a) name three types of cold chisels and give one use of each (3 marks)

b) List four operations that can be performed on a drilling machine (2 marks)

3. a) Give the procedure of testing for flatness on a plate of metal using the marking table (3 marks)

a) Name any two tools found in the metal workshop that are not majorly made of metals (2 marks)

4. Name a suitable material and state the property that makes it appropriate for making each of the following (4 marks)

i. Twist drill

ii. Rivet

iii. Kitchen knife

iv. Soldering bit

5. a) Give the micrometer reading in figure 1 below (1 mark)

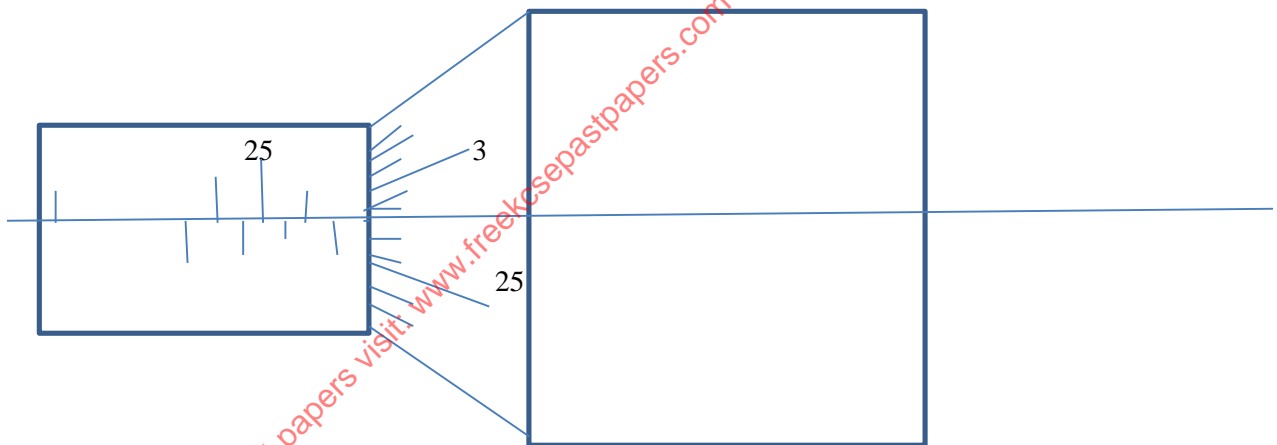


Figure 1

b) what is the material used to make the spindle and the anvil faces of a micrometer screw gauge and give the reason for the choice of material. (2 marks)

6. a) Describe two methods of strengthening an edge of a sheet metal article (2 marks)

b) State two advantages of pop-riveting over snap head riveting (1 mark)

7. a) with the aid of sketches, explain the difference between a forged component and a machined one

(2

marks)

b) list down four forging processes

(2 marks)

8. a) give the use of each element given below that is found in high speed steel

i. tungsten

ii. molybdenum

iii. cobalt

(3 marks)

b) What is?

i. safety

ii. safety precaution

(2 marks)

9. explain the term 'planishing' as applied in metalwork

(1 mark)

10. Figure 2 shows a cylinder that has been truncated at 30° as shown below. Draw its surface development on the A4 drawing paper provided. (5 mark)

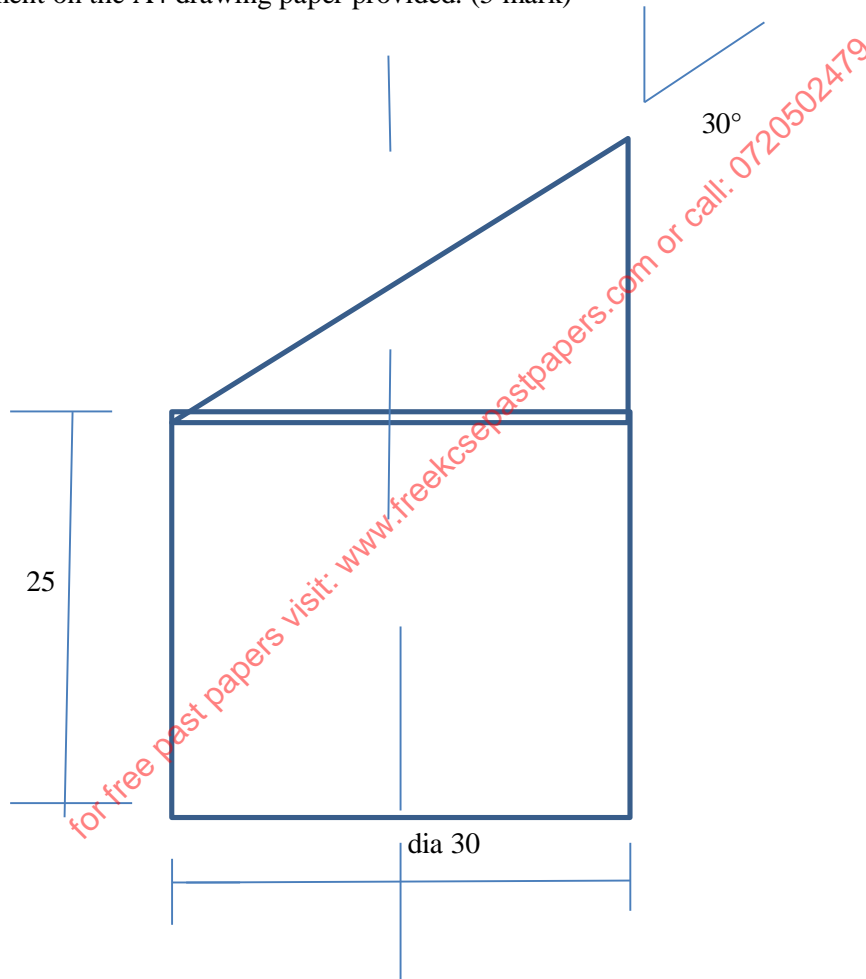


figure 2

SECTION B

Do question 11 and any other three questions in this section. Candidates are advised not to spend more than 25 minutes in question 11

figure 3 shows a machined block drawn in isometric projection.

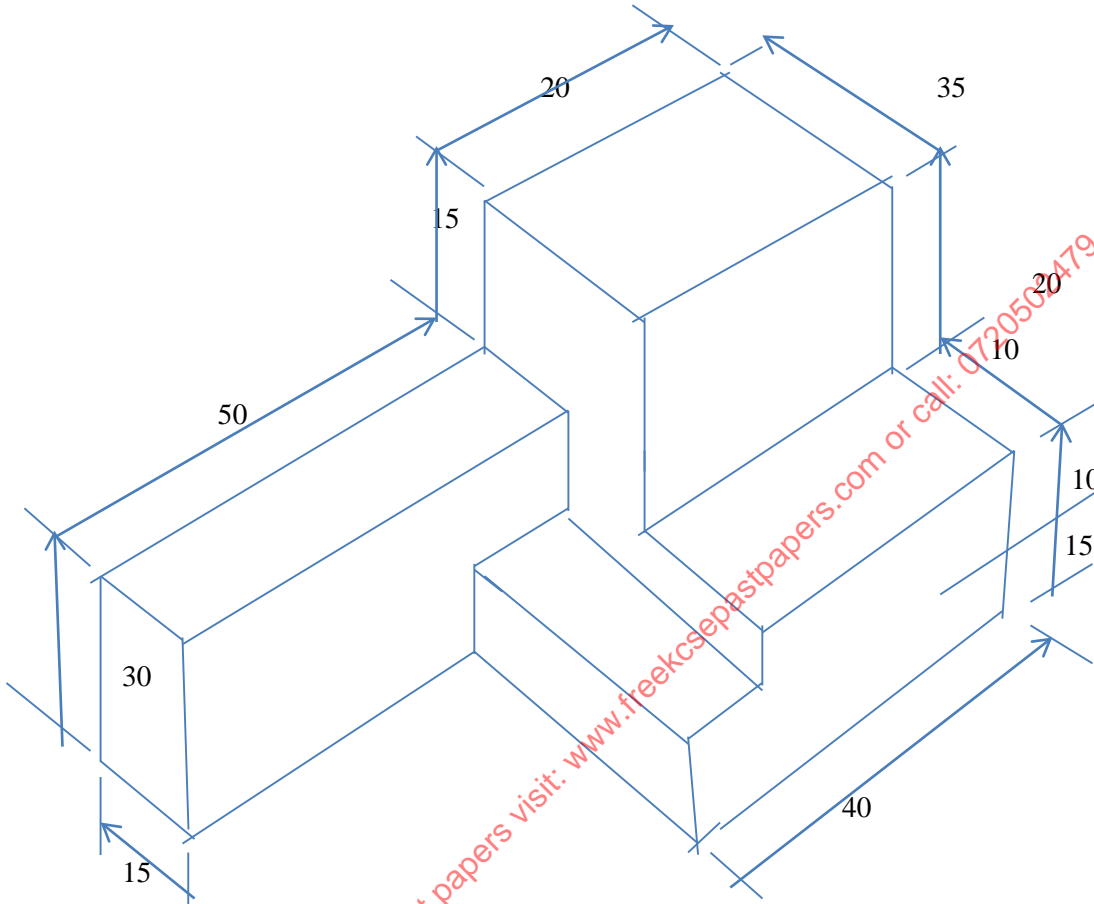


Figure 3

On the A4 paper provided, draw full size in third angle orthographic projection;

- i. the front elevation from the direction of arrow A
- ii. end elevation
- iii. plan
- iv. insert any four major dimensions (15 marks)

12.a) name the charges of the blast furnace and explain their functions.(6 marks)

b) Explain why the slag tapping notch is higher than the iron tapping notch. (2 marks)

c) Explain using suitable diagram show the double charging bells of the blast furnace works. (6 marks)

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d) Draw the structure of the blast furnace and label;

i) the tuyere

ii) The brick wall lining

iii) Steel casing (3 marks)

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13. a) Explain the principle of arc welding(6 marks)

b) Name two tools used when arc welding. (2 marks)

c) Using suitable sketches show the following arc welding defects and state their causes,

i) Undercut

ii) Lack of fusion

iii) Porosity

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d) Give function of the slug when arc welding. (1 mark)

14. a) Explain why the following metals are used for the purposes stated;

i) Aluminum for making aero plane bodies

ii) Brass for making water taps

iii) Copper for making decorative wall plates

iv) cast iron for making machine beds

b) Outline the procedure for machining the piece used in fig 4 using a lathe machine from a round bar of diameter 25mm.

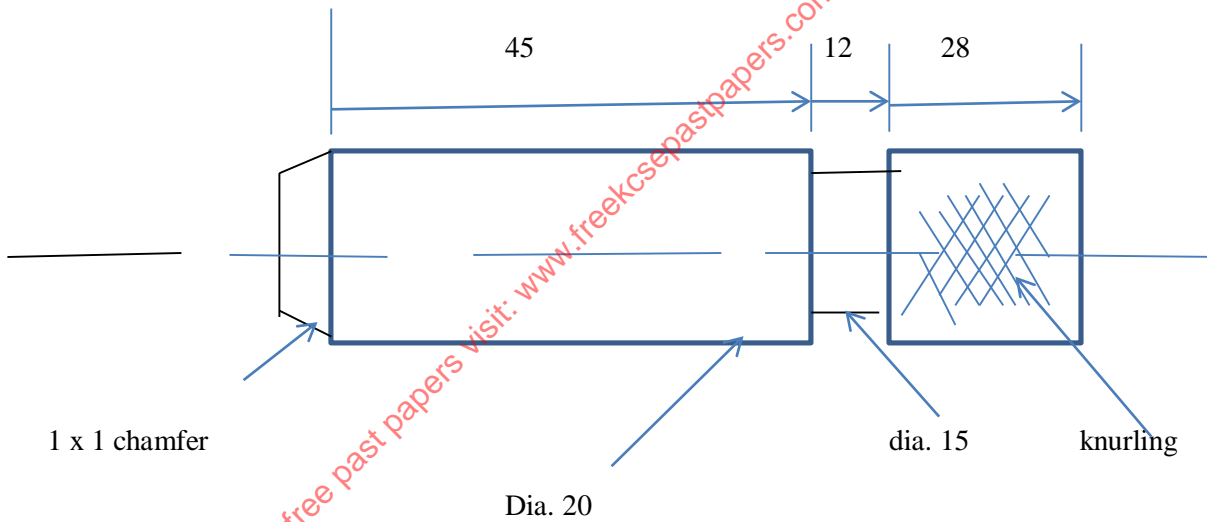
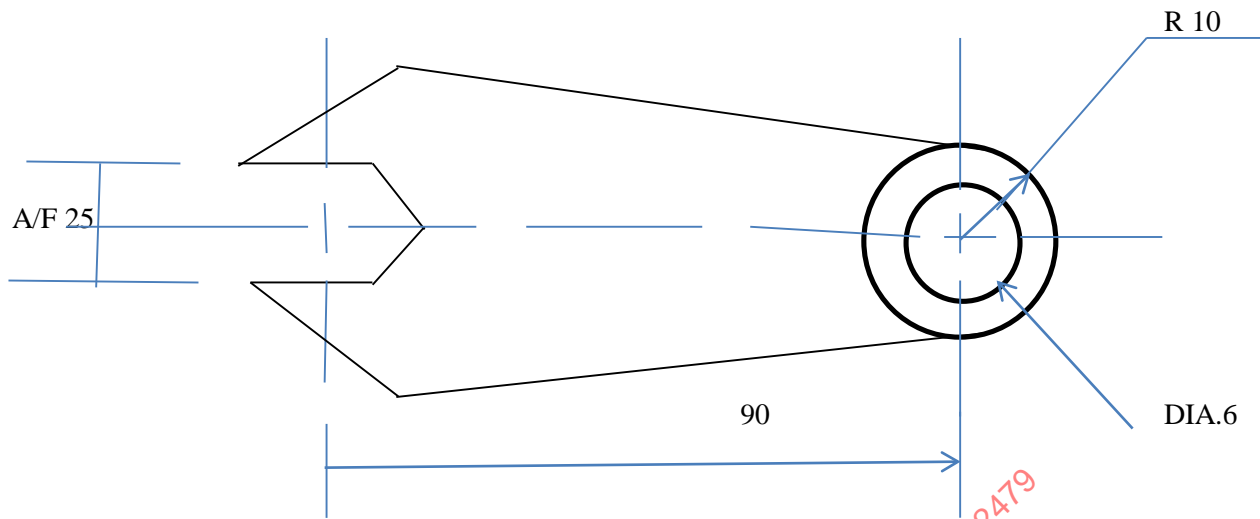


Fig 4

15. fig. 4 shows a working diagram of a spanner made from a mild steel plate 122x42x4mm.

i.





Outline the procedure of;

a) marking the spanner

b) making the spanner

c) case hardening the spanner

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