Name: **…………………………………………………….............**Index**…………………………**

Candidate’s signature**…………………………**

Date**……………………………………………**

**BUNAMFAN CLUSTER EXAMINATIONS 2021**

**445/1**

**METALWORK**

**PAPER 1**

**December 2021**

**Time: 2 ½ Hours**

**INSTRUCTIONS TO CANDIDATES**

1. Write your name and index number in the spaces provided

2. This paper consists of two sections**: A** and **B.** Answer all questions in section **A** and in Section **B.**

3. **Answer question 11 and any other three** in the spaces provided.

4. All dimensions are in millimeters unless otherwise stated.

**For examiner’s use only**

|  |  |  |  |
| --- | --- | --- | --- |
| **Section** | **Question** | **Maximum score** | **Candidates score** |
| **A** | 1-10 | 40 |  |
| **B** | 11 | 15 |  |
| 12 | 15 |  |
| 13 | 15 |  |
| 14 | 15 |  |
| 15 | 15 |  |
|  | | **Total score** |  |

*This paper consists of 13 printed Pages*

*Candidates should check the question paper, to ensure that all the pages are printed as indicated; and no questions are missing*

**SECTION A**

**ANSWER ALL QUESTIONS IN THIS SECTION**

1. With respect to finishing of metal surfaces ;
2. State **two** methods of applying paint. [2 marks]

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1. List **two** reasons for applying paint on metal articles. [2 marks]

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2. (a) List **two** uses of drift in forging. [2 marks]

….…………………………………………………………………………………………… ……………………………………………………………………………………………… ………………………………………………………………………………………………

(b) State **two** precautions to be observed when twisting to avoid uneven twist. [2 marks]

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3. (a) Give **two** reasons for using hollow metals in making furniture. [2 marks]

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(b) State **four** safety precautions to be observed when grinding. [4 marks]

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4. (a) List **four** specifications of a rivet. [4 marks]

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(b) State **three** factors to consider when selecting spelter for brazing. [3 marks]

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5. (a) List **four** methods of holding work piece on a lathe machine. [4 marks]

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(b) State **two** reasons for knurling. [2 marks]

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6. (a) List **four** sources of information for related career choice in school setting. [2 marks]

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(b) State and explain three workshop records. [3 marks]

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7. (a) Explain the purpose of annealing. [2 marks]

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(b) Outline anealing process [2 marks]

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8. (a) State and explain three forging tools. [3 marks]

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(b) State **two** disadvantages of cooling a brazed joint rapidly. [2 marks]

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9. (a) State **two** advantages of forging over machining. [2 marks]

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(b) Use sketches to describe three types of tin snips. [3 marks]

10. Distinguish between:

a) Gross pay and net pay. [2 marks]

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b) Change and balance. [2 marks]

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**SECTION B: [60 marks]**

Answer **question 11** on the **A3 paper** provided and **any other three** questions from this section in the spaces provided.

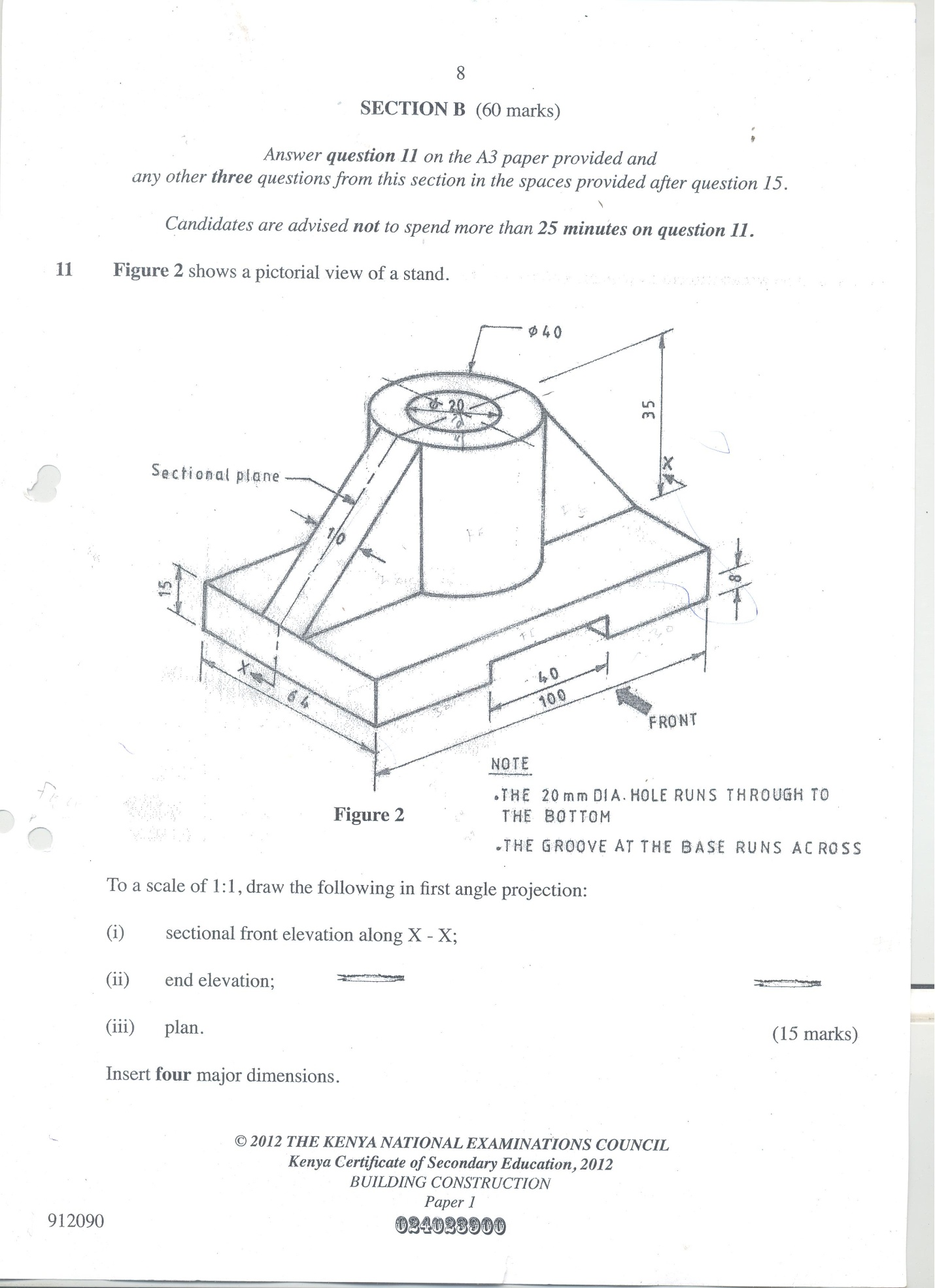
***Candidates are advised to spend not more than 25mins*** *0n question 11****.***

11. Figure 2 shows a drawing isometric .Draw the following in 1st angle. [15marks]

a)The front elevation through cutting plane X-X

b)The end elevation.

c)The plan



12. a) Name **three** methods of testing the quality of gas welded joints. [1 ½ marks]

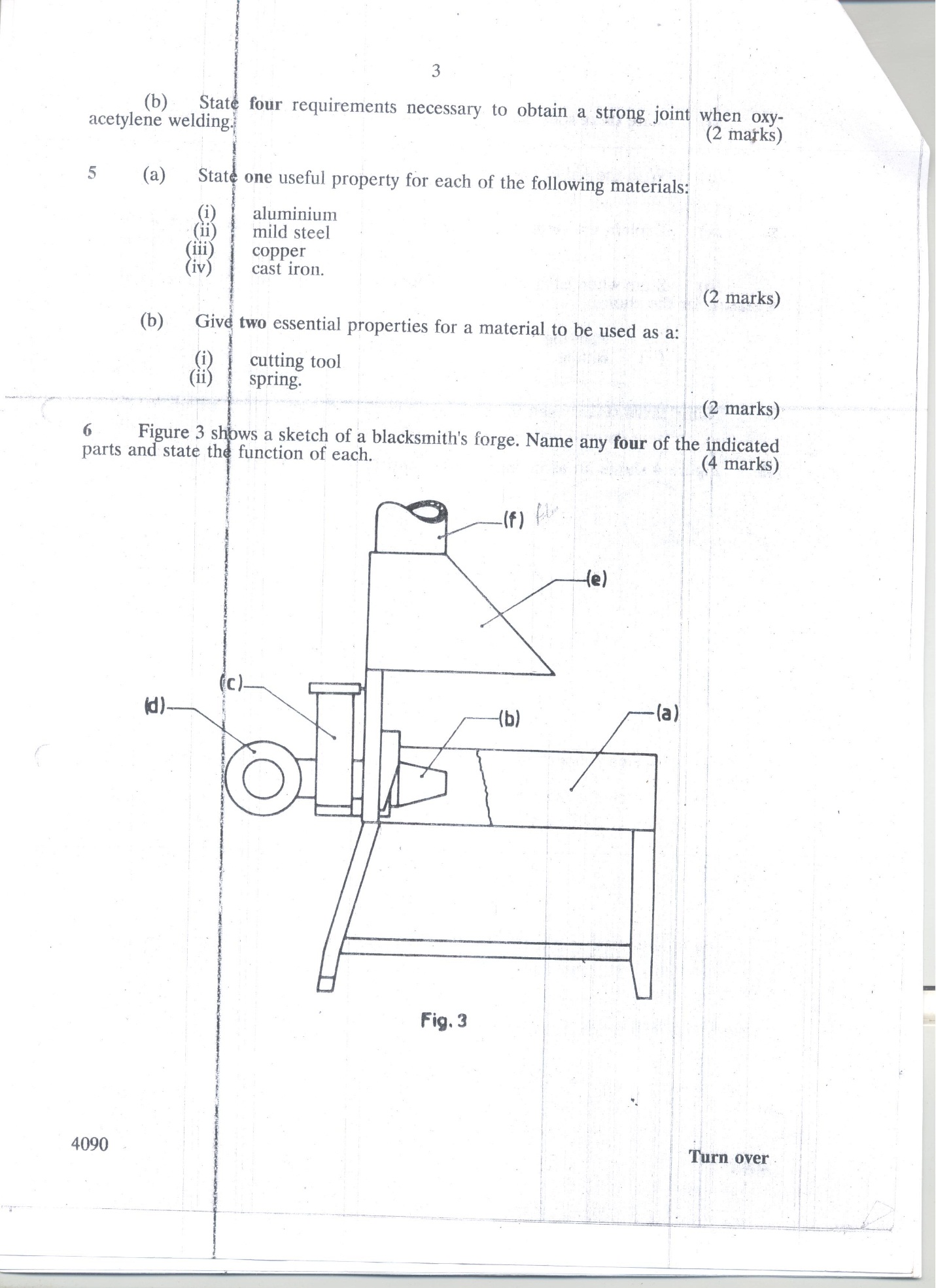
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b) Sketch the correct flame for welding brass and outline the procedure of setting the flame. [5 ½ marks]

c) Use a labeled sketch to show an appropriate technique for gas welding thick plates and give

**three** reasons for using the technique. [8marks]

13. a)The figure below shows a very important equipment used in forgework.



(i) Give the name of the equipment. [1 mark]

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(ii) Name parts labeled ***c, e*** and ***f.*** [1 ½ marks]

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(iii) State the uses of parts ***a, b*** and ***d.*** [1 ½ marks]

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b) List **four** factors that would contribute to a poorly brazed joint. [4 marks]

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c) State **three** differences between gas welding and brazing. [3marks]

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d) Give **four** safety precautions to be observed when tapping a through hole. [4 marks]

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14. a) Using sketches explain the following terms as applied in limits and fits. [4 marks]

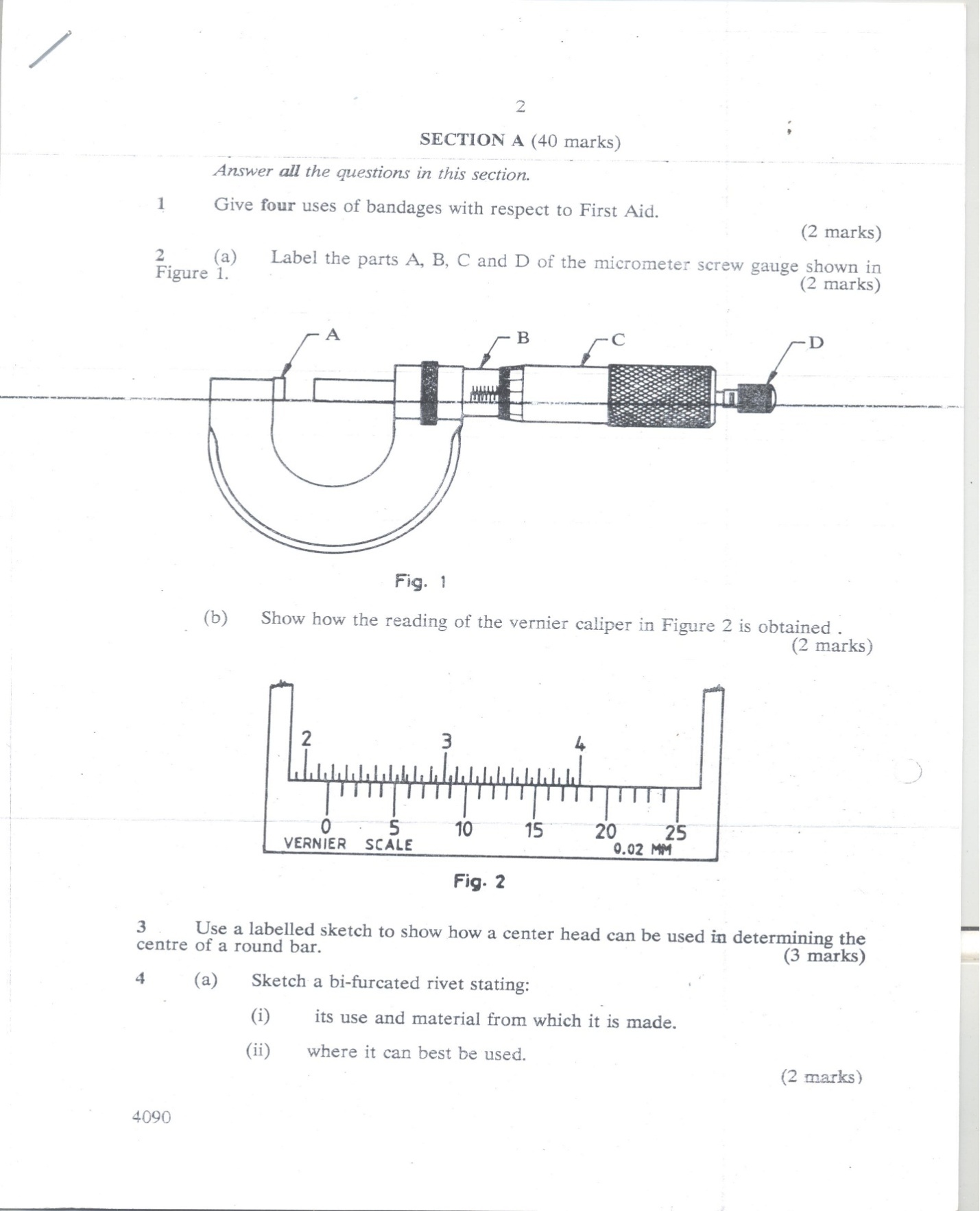
i) Nominal size

ii) Tolerance

iii) Allowance

iv) Lower limit.

b) The figure shows a precision tool used in metalwork.



i) Show how to find its accuracy. [1 mark)

ii) Name the parts labeled ***A,B,C*** and ***D*** and give the function of each. [4 marks]

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c) Give **two** applications of each of the three types of fits. [3 marks]

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d) State **three** safety precautions to be observed when using the vernier calipers. [3 marks]

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15. a) Illustrate **five** operations that can be performed on a drilling machine. [5 marks]

b) With reference to cutting external threads:

(i) Name **two** types of dies used. [2 marks]

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(ii) State **two** reasons for using cutting oil. [2 marks]

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c) An M10 internal thread is to be cut in a mild steel. Given that the thread pitch is

1.5mm, determine the size of the drill to be used. [1mark]

d) Give **five** reasonswhy we finish metal articles. [5 marks]

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