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

 Candidate’s signature**…………………**

 Date**…………………………………**

**WISDOM CLUSTER EXAMINATIONS 2021**

**445/1**

**METALWORK**

**PAPER 1**

**September/October**

**2 ½ Hours**

***INSTRUCTIONS TO CANDIDATES***

1Write 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,Answer qn 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* ***14 printed Pages***

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

1. a) Give **two** reasons why one should study metalwork in high school. (2 marks)

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 b) Give **four** factors influencing the choice of career of an individual. (2 marks)

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2. a) Give the three aspects of **safety.** (1 ½ marks)

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b) State **one** use of each of the following safety devices. (1 ½ marks)

 (i) Leather gloves

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 (ii) Clear goggles

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 (iii) Helmet

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3. Give **three** differences between **high carbon steels** and **high speed steels.** (3 marks)

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4. Define the following mechanical properties of metals and give one example of a metal having

 such property . (6 marks)

 a) Hardness

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 b) Malleability

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 c) Toughness

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 d) Plasticity

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5. a) Give **two** uses of screw threads. (2 marks)

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 b) Give **four** points to observe in care for taps and dies. (2 marks)

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6. Give the steps followed when carrying out the following finishing processes. (4 marks)

 a) Bluing

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 b) Oil blacking

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7. a) Define the term soft soldering. (1 mark)

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 b) Name the following in soft soldering and give the use of each in order to obtain a sound

 soldered joint. (3 marks)

 (i) Filler metal

 ....................................................................................................................................................

 (ii) Flux

 .....................................................................................................................................................

 (iii) Heat source

 ...................................................................................................................................................

8. What causes the following defects during riveting? (4 marks)

 a) Rivet bends

 ......................................................................................................................................................

 b) Loose riveted joint

 ........................................................................................................................................................

 c) Plate split

 ........................................................................................................................................................

 d) Gap left between plates

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9. a) Give **two** uses of a pair of dividers as a metalworking tool. (2 marks)

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 b) What type of hacksaw blade is recommended for a school workshop? Give a reason for your

 choice. (2 marks) ………………………………………………………………………………………………… ………………………………………………………………………………………………… …………………………………………………………………………………………………...

10. a) State **two** uses of a cutting fluid in metal cutting. (2 marks)

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 b) What is used for marking the following in sheet metalwork? (2 marks)

 i) Folding lines

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 ii) Cutting lines

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**SECTION B**

***This section consists of four questions, attempt question 11 and any other three questions***

11***.***  The fig below shows a machined block drawn in first angle orthographic projection, draw full

 size the block isometric ( 15 marks)

1. a) Explain the following heat treatment processes (6 marks)
2. Hardening

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1. Tempering

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

1. Annealing

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

 b) Use a graph to explain the behavior of steel when heated. (6 marks)

 c) List **three** methods of checking furnace temperatures when carrying out heat treatment (3 marks)

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13. a) Outline the procedure of lighting a blow pipe. (5 marks)

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 b) Give **four** functions of flux in brazing (4 marks)

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c) Use labelled sketches to show the difference between rightward and leftward welding technique. (4 marks)

 d) List  **four** factors that affects the quality of a brazed joint (2 marks)

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14. a) State and explain **four** parts of a combination set (4 marks)

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 b) Use sketches to show **four** uses of a combination set. (6 marks)

 c) Below is a diagram of a tool used in measuring, give the reading shown in the instrument. (2marks)

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 d) State three care for each of the following (3 marks)

1. Micrometer screw gauge

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1. Vernier caliper

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

15. a) **Figure 4** shows a diagram of a lathe machine

D

E

A

B

C



F

H

G

a) Name the parts labelled **A, B, C, D, E, F, G** and **H**. (3 marks)

A.………………………………………………………………………………………………………

B.………………………………………………………………………………………………………

C.………………………………………………………………………………………………………

D.………………………………………………………………………………………………………

E.………………………………………………………………………………………………………

F.………………………………………………………………………………………………………

b) Explain the procedure of making the component shown (12 marks)

25

28

25

30

15

26

30

20

50

36

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