**NAME……………………………………………………….INDEX No:……………….……………**

**SCHOOL:………………………………………………Candidate’s Signature……………………..**

**ADMISSION NO……….…………… Date………………………………………….**

**WISDOM CLUSTER EXAMINATIONS 2021**

**449/1**

**DRAWING & DESIGN**

**Paper 1**

***September***

**Time: 2 ½ Hours**

**INSTRUCTION TO CANDIDATES**

* You should have the following for this examination;
* Drawing instruments
* Drawing paper size A3
* Write your **nam**e and **index number** in the spaces provided.
* This paper consists of **three** sections **A, B** and **C.**
* Answer **All** the questions in sections **A** and **B** and **any TWO** questions from section **C.**
* Questions from section **A must** be answered in the provided **answer sheets.**
* Questions in section **B** and **C** should be answered on the **A3** drawing paper provided.
* All dimensions are in milimetres unless otherwise stated.
* Candidates may be penalized for not following the instructions given in this paper.

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| --- | --- | --- | --- | --- |
|  | **FOR EXAMINERS USE ONLY** | | | |
| **SECTION A;** | | **1 - 12** |  |  |
| **SECTION B;** | | **13** |  |  |
| **SECTION C;** | | **14 - 16** |  |  |
| **GRAND**  **TOTALS** | |  |  |  |

**This paper consists of 8 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 (50 Marks)**

***Answer all the questions in this section***

1. Define the term:

(a) Designer (1 mark)

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

(b) State **two** reasons of using different types of lines in engineering drawing. (2 marks)

1. ………………………………………….…………………………………………………
2. ………………………………………….…………………………………………………
3. Define each of the following properties of materials: (2 marks)
4. Plasticity……………………………………………………………………………………

………………………………………………………………………………………………

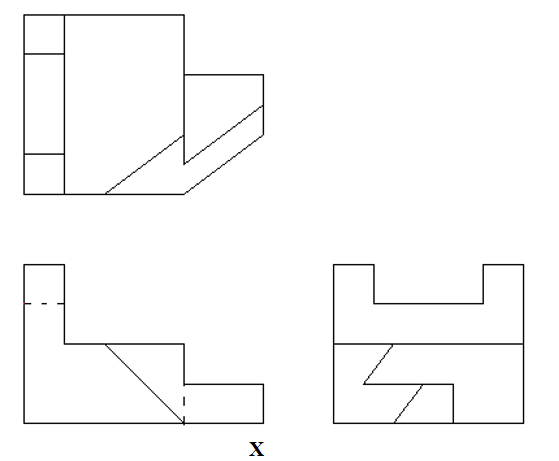
1. Tensile strength ……………………………………………………………………….………………………

………………………………………………………………………………………………

1. (a). State the **two** major method of timber conversion. (2 marks)
2. ………………………………………………………………………………………….
3. ………………………………………………………………………………………….

(b). State **two** effects of poor disposal of engineering materials to the environment. (2 marks)

1. ………………………………………………………………………………………….
2. ………………………………………………………………………………………….
3. State **three advantages** for drawing sectional views in drawing. (3 marks)
4. ………………………………..……………………………………………………………
5. ………………………………………………………………………………………………
6. ………………………………………………………………………………………………
7. Explain **three** advantages of using computer in drawing. (3 marks)
8. ………………………………………………………………………………………… ………………………………………………………………………………………………..
9. ………………………………………………………………………………………………………………………………………………………………………………………………
10. …………………………………………………………………………………………………………………………………………………………………………………..…………
11. Using a circle of radius 20mm, show the following; (3 marks)
12. Sector
13. Segment
14. Chord
15. Quadrant
16. Circumference
17. Tangent
18. Figure below shows two views of a block drawn in third angle projection. Sketch in good proportion the isometric view of the block taking X as the lowest point. (4 marks)



1. (a) Give **two** realpractical application of the intersection of surfaces or interpenetration of solids. (2 marks)

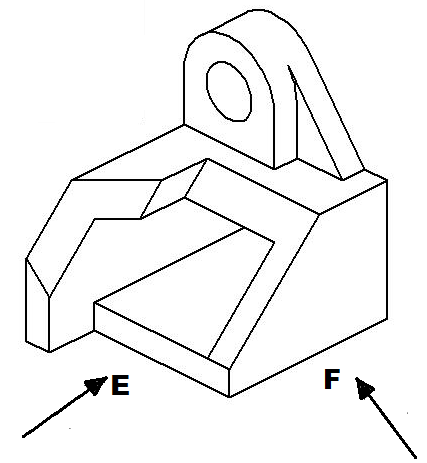
1. ……………………………………………………………………………………………………………………………………………………………………………………
2. ……………………………………………………………………………………………………………………………………………………………………………………

(b). Explain briefly **three** major areas to be considered in design. (3 marks)

1. ………………………………………………………………………………………………………………………………………………………………………………
2. ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………
3. ……………………………………………………………………………………………………………………………………………………………………………
4. (a). List **three** characteristics of a good technical drawing paper. (3 marks)
5. …………………………………………………………………………………………
6. …………………………………………………………………………………………
7. …………………………………………………………………………………………

(b). Outline **four** main steps involved in design process. (4 marks)

1. …………………………………………………………………………………………………………………………………………………..…………………………………
2. …………………………………………………………………………………………………………………………………………………………………….………………
3. ………………………………………………………………………………………………..……………………………………………………………………………………
4. ……………………………………………………………………………………………………………………………………………………………………………………
5. Define the term: (1 marks)
6. Loci ……………….……………………………………………………………………………………..………………………………………………………………………………………………………………………………………………………………………………………….
7. State **two** important points considered before attempting to construct any locus. (2 marks)
8. ………………………………………………………………………………………….
9. …………………………………………………………………………………………
10. Sketch in first angle projection the orthographic views of the block shown below. (6 marks)



1. (a). State **three** factors considered when lettering. (3 marks)
2. ……………………………………………………………………………………..
3. ……………………………………………………………………………………..
4. …………………………………………………………….……………………….

(b). Construct a diagonal in which 30mm represents 1m, of 5 metres long to read 10mm. Mark

off a distance of 3M 670mm. Show all your working clearly (4 marks)

**SECTION B (20 marks)**

*This question is* ***compulsory.***

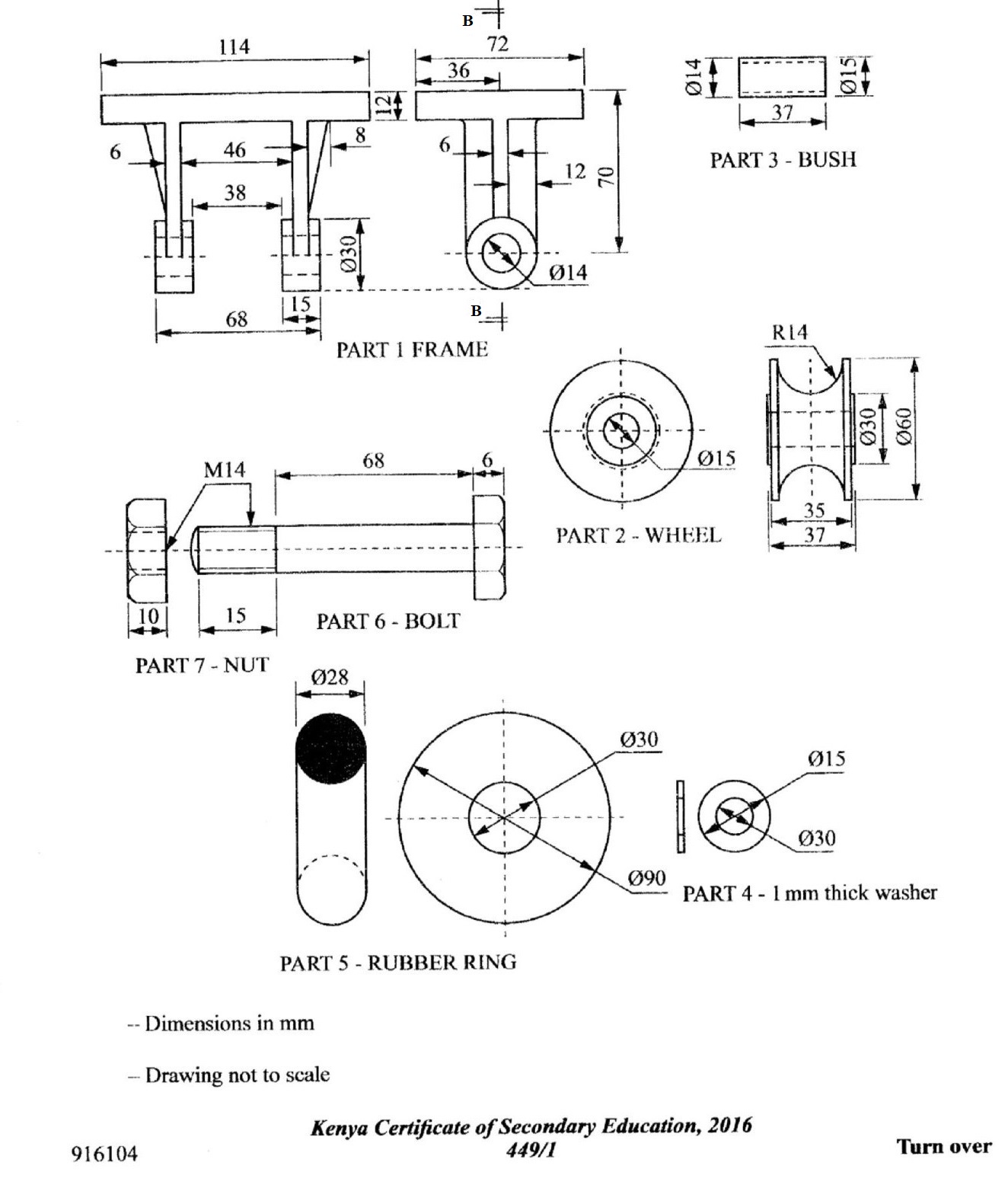
***Candidates*** *are advised to spend* ***not more than an hour*** *on this question.*

1. The figure below shows parts of a machine component drawing in first angle projection.

Assemble the parts and, FULL SIZE, the following:

1. The sectional front elevation along the cutting plane B-B.
2. The plan.
3. The end elevation

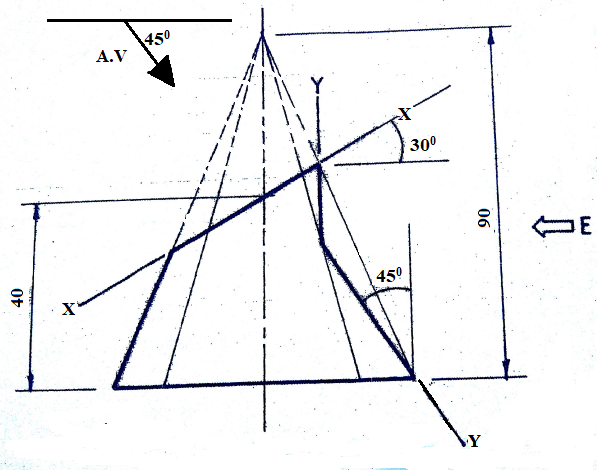
Insert **six** leading dimensions and **part list**. Unspecified dimensions are left to the candidate’s discretion. Hidden details may be included where necessary. (20 marks)



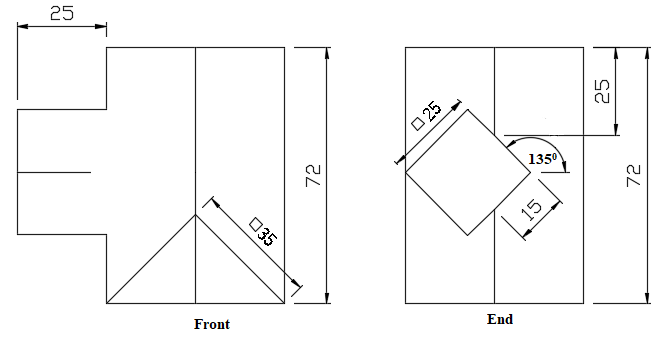
**SECTION C (30 marks)**

*Answer any* ***two*** *questions in this section.*

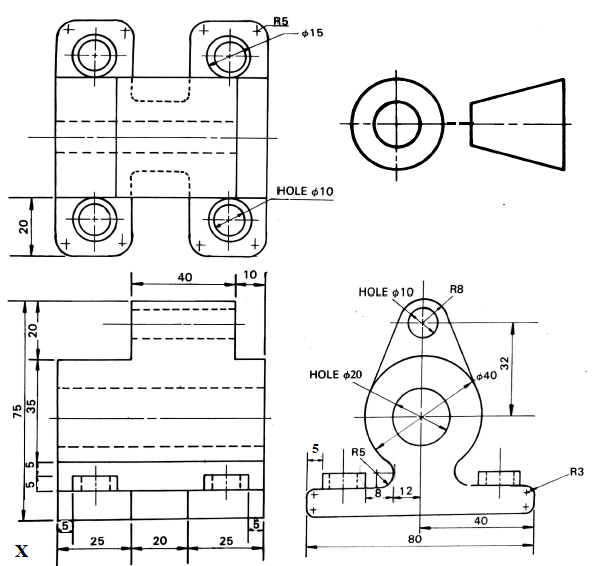
1. The figure below shows the front elevation of a regular solid hexagonal pyramid of side 35mm which has been cut by planes X-X and Y-Y. Copy the figure and Draw the following: (15 marks)
2. The sectional plan.
3. The end elevation in the direction of arrow E.
4. The true shape of the section X-X.
5. The auxiliary view

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1. The figure below shows the incomplete front and end elevation of two dissimilar off-setted squared pipe meeting at right angle. Using the dimension given, show line of interpenetration and then draw in first angle orthographic projection the following views:
2. The complete front elevation
3. A full plan;
4. An end elevation;
5. A full development of the smaller pipe. (15 marks)



1. Orthographic views of machine part in third angle projection are shown below. Draw an isometric view **TWICE FULL SIZE SCALE** clearly showing all the features of the components taking X as the lowest point. (Include at least six main dimensions, hidden details may be shown where necessary. (15 marks)



**This is the last printed page.**