**Term 2 - 2022**

**DRAWING AND DESIGN (449/1)**

**FORM FOUR (4)**

**Time: 2½ Hours**

**Name**: …………………………………………………………. **Adm** **No**: ……………….

**School**: ……………………………………………………….. **Class**: …………………..

**Signature**: …………………………………………………….. **Date**: …………………...

**FOR EXAMINERS USE ONLY**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **TOTAL** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**INSTRUCTIONS TO CANDIDATES.**

You should have the following for this examination:

* Drawing instruments
* 3 sheet of drawing paper size A3

This paper consists of THREE sections A, B and C.

Answer ALL the questions in section A and B and any TWO questions from section C.

Questions in section A must be answered on the answer sheets provided.

Questions in section B and C should be answered on the A3 drawing papers provided.

All dimensions are in millimeters unless otherwise stated.

Candidates may be penalized for not following the instructions given in this paper.

**SECTION A (50 MARKS)**

***Answer All Questions In This Section***

1. (a) Give the following information regarding parastatal organizations in Kenya with regard to; (**3 marks**)
2. Ownership
3. Management
4. Services
5. (a)State one disadvantage of using each of the following items to hold paper on the drawing board. (**2 marks**)
6. Masking tape
7. Thumb pins

(b) Describe each of the manufactured boards; (**3 marks**)

1. Ply wood.
2. Chip board
3. Block board.
4. (a). State three factors to consider when choosing materials for engineering works

 (**3 marks**)

 (b). Explain the meaning of the term **“alloy”** as applied in materials and give two examples ( **2marks**)

1. State the importance of following steps in the design process. (**3 marks**)
2. Evaluation:
3. Final drawing:
4. Mock-up
5. Construct an ellipse using the rectangle method whose sides are 80mm

 by 45 mm. (**5 marks**)

1. Construct a regular octagon inside a square whose sides are 80mm. ( **5 marks**)
2. Two views of a machine component are shown below in **Figure 1**. Sketch the block in oblique taking **X-X** as the lowest point (**6 Marks**)



1. Draw an isometric circle whose diameter is 60mm using ordinate method. (4 marks)
2. Front elevation of a pentagonal pyramid truncated by the cutting plane **X\_X** is given in figure 2.

Sketch the auxiliary view and a plan. (8 marks)



1. Two views of a machine part are shown in **figure 3**. Sketch a two point perspective of the block. (8marks)



**Section B (20 Marks)**

**This is a compulsory question.**

**Students are advised not to spend more than 1 hour answering this question**

1.



**Section C (30 Marks)**

 ***Answer any two questions from this section***



 14. Define the term involute. (2 marks)

(b) Draw an involute to a circle of with a diameter of 30mm. (8 marks)

(c) Draw a tangent to any point T on the involute. (5 marks)