ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Advanced Level

METAL TECHNOLOGY AND DESIGN 6040/4

Paper 4 Design Project

SPECIMEN PAPER

No additional materials are required.

INSTRUCTIONS TO CANDIDATES

Answer **all** options.

This specimen paper consists of 4 printed pages.

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OPTION 1: FORM 5

Disabled learners who are physically challenged in the upper limps face difficulties in turning pages of books, magazines, etc when reading.

Design and make a device that will turn pages for the learners.

OPTION 2: FORM 6

A builder is making losses through engaging personnel who carry bricks, mortar and other building materials to the scaffold.

Design and make a device that can be used to carry building materials up the scaffold.

PROJECT GENERAL NOTES

The design should include bench-fitting, fabrication and machine-work.

NB: Candidates are allowed and encouraged to produce a scaled down version of either design when realising the artefact. The scale applied to the artefacts should be given in the Folio. Candidates are also encouraged, where possible, to use and combined different and relevant materials, e.g. metal, wood or plastic in realising their designs but the predominant material should be metal.

GENERAL NOTES

When candidates are working on this project, teachers should refer to the syllabus explaining the design Project and to other design literature and texts for guidance.

LITERATURE AND TEXTS FOR GUIDANCE

- Industrial Waste Management (Environmental Protection; Disposal Methods)
- Solid Solution (Alloying)
- Working Properties and characteristics of materials
- Industrial manufacturing processes
- Systems of manufacturing
- Cultural and technological influences on design
- Design Process Models (Computer Aided Design – CAD)
- Intellectual Property Rights
- Mechanics
- Structures
- Electronics (Sensors and Logic Gates)
- Engineering Calculations
- Graphics Engineering
- Value Addition and Beneficiation
- Workshop tests of Engineering Materials
- Manufacturing
- Quality Control Systems
- Automation – ICT Tools

PROJECT TIPS

- The use of ICT tools and equipment is strongly encouraged.
- Project should be submitted by end of November in Form Five (5) and October in Form Six (6).
- Quality projects will score high marks.
- Illustrations can be done in the form of sketches; pictures; cuttings and formal drawings.

COMPETENCIES

- planning
- researching
- problem solving
- analytical thinking
- drawing and design
- synthesising
- manufacturing
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OBJECTIVES TO BE ASSESSED

- to demonstrate research skills
- to demonstrate drawing and design skills
- to demonstrate correct use of tools and equipment

PROJECT CONTENT

Solving real life problems

CANDIDATES SHOULD PRODUCE:

(i) a detailed A3 Design Folio showing the development of the design process from the situation through to the final solutions. The final section of the Folio should include the evaluation.

(ii) a well constructed mock-up/model of the chosen solution, in any suitable material, which should be predominantly metal.

(iii) a well constructed artefact of the chosen solution.