Preamble for Design and Technology (6045)

The Examinations Council of Zambia has made adjustments to the assessment of Design and Technology at Grade 12 level so as to be in line with the revised Design and Technology Senior Secondary School Syllabus of 2013 developed by Curriculum Development Centre (CDC) of the Ministry of General Education.

Purpose

The purpose of the Design and Technology assessment at Senior Secondary School Level is to measure candidates' knowledge and understanding, problem-solving, design communication and realisation (portfolio and artefact). The examination will also serve the purpose of certification and placement.

Assessment Objectives

Candidates will be assessed against the following objectives:

Knowledge and understanding
1. state facts, name items and describe processes
2. apply knowledge to basic design and manufacturing
3. reason and anticipate consequences of the design and realisation process
4. show the interrelationship between design and societal needs
5. show knowledge of safe practices in the use and care of tools

Design and Problem-Solving
1. identify from a theme a specific need for which a solution is required
2. analyse a problem, consider the functions, beauty, human and economic issues and draw up a design specification
3. generate solutions to a design problem, bearing in mind the constraints of time, skills and available resources
4. test the effectiveness of the design solution and suggest modifications or improvements
5. show application of entrepreneurial skills and ability in financial management
6. investigate various materials and their properties

Design Communication
1. communicate ideas in drawing, sketch or graphical form
2. represent details of information, shape, construction, movement and size through drawing
3. interpret information from one form to another
4. interpret patterns, sketches, models, charts, symbols, logos and illustrations
5. design solutions from given information
Realisation
1. plan and organise the work procedure involved in the realisation of a solution, in a portfolio
2. select appropriate materials and equipment for the realisation of the product
3. demonstrate appropriate skill, and application of materials in relation to their use
4. demonstrate appropriate skills by the correct and efficient use of tools in the realisation of the product
5. demonstrate creativity, resourcefulness and multi-skills in the realisation of the solution

Test Design

The Design and Technology examination will be made up of three (3) papers. Candidates will be expected to sit for all the three (3) papers to be certified.

<table>
<thead>
<tr>
<th>Paper and Paper Code</th>
<th>Type of Questions</th>
<th>Number of Questions</th>
<th>Duration</th>
<th>Total Marks</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design and Technology Paper 1</td>
<td>Graphic Communication Design and Drawing</td>
<td>3</td>
<td>2 hours 30 minutes</td>
<td>100</td>
<td>30%</td>
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<tr>
<td>Design and Technology Paper 2</td>
<td>Theory and Design Structured</td>
<td>5</td>
<td>2 hours 30 minutes</td>
<td>30</td>
<td>30%</td>
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<tr>
<td>Design and Technology Paper 3</td>
<td>Major Project</td>
<td>1 (Theme)</td>
<td>Jan.–Sep. each year</td>
<td>110</td>
<td>40%</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
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<td><strong>100%</strong></td>
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EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

Design and Technology 6045/1
Paper 1 (Graphic Communication)

Additional Information:
Drawing instruments
A3 drawing paper

Time 2 hours 30 minutes

Instructions to Candidates
There are five (5) questions in this paper. Answer only three (3) questions.

Section A
Section A has two parts. Part A has one compulsory question while part B (solid Geometry) has two questions and you are expected to answer only one question.
Both questions in part B carry equal marks.

Section B
There are two questions in this section and candidates are expected to answer only one question.
Draw your answers in the separate drawing paper provided.

Information for candidates
The number of marks is given in brackets [ ] at the end of each question or part of question.
Omission of construction lines will result in loss of marks.
Candidates are expected to use either First or Third Angle Projection accompanied by the appropriate symbol. All drawings and sketch work should be drawn in pencil and apply any method of rendering or appropriate trade symbols.
Unless otherwise stated all measurements are in millimetres.
Cell phones are not allowed in the examination room

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This question paper consists of 6 printed pages
Section A [60 marks]

Part A - Compulsory

1. The design of a logo for a Honey Packaging Co-operative Society (HPCS) is shown in Figure 1 below.

(a) Draw full size the profile of the logo, showing all geometrical constructions. [20]

(b) Using freehand, design and indicate the letters "HPCS" in the octagonal space in the logo. [10]
Part B

There are two questions in this part. Answer only one question

2 Two views of a dumb bell are shown in figure 2 below.
Draw an isometric view of the dumb bell with corner \( N \) in the foreground.

![Diagram of a dumb bell with dimensions and views]

**Figure 2**

[30 marks]
A local detergent manufacturing company would like learners to design a box in which their famous detergent paste could be packed for sale. Liseli designed a box shown in Figure 3.

(a) Draw full size, the surface development of the box including the flaps, the seam being at J - J.

Figure 3
Section B [40 marks]

There are two questions in this part. Answer only one question

4 Your mother has problems finding her jewelry in the morning because it is not kept in one place. As a Design and Technology learner, you have come up with a design shown in figure 4 as a solution to the problem.
The case is to be made from 10mm thick solid wood, with a partition of 10mm thick and 80mm high resting on the bottom. The lid and the top part of the box are rebated to form a tight fit. The bottom part of the jewelry box is fitted with a 5mm plywood, grooved in 10mm from the bottom.
With the lid placed in position and using instruments, draw in either First or Third Angle Projection:

(a) a sectional elevation, the section of the required view being at X – X.  
(b) an end elevation in the direction of arrow E.  
(c) a plan in the direction of arrow P. 

Figure 4

Design & Technology 6045/1/2016

[40 marks]
In a school laboratory, apparatus are required to be kept in appropriate racks. Test tubes are stored in test tube racks. An isometric pictorial view of a test tube made of 6mm thick solid wood is shown below in Figure 5. The rack is designed to carry four test tubes and two boiling tubes through the diameter 16mm and diameter 20 holes respectively.

(a) Draw full size the **front elevation** of the test tube rack. [10]
(b) Draw a sectional **end elevation**, the section of the required view being at Y - Y. [25]
(c) Draw a **plan**. [5]