

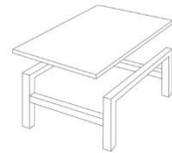
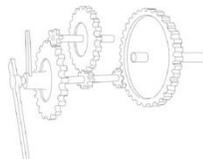
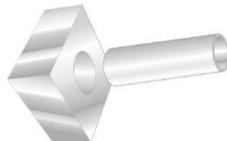
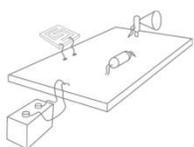


BOTSWANA  
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# 2012 JCE DESIGN & TECHNOLOGY SCHEME OF ASSESSMENT

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# DESIGN AND TECHNOLOGY SCHEME OF ASSESSMENT

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# DESIGN AND TECHNOLOGY SCHEME OF ASSESSMENT

## 1. INTRODUCTION

This document is intended to give guidance on how the JCE Design and Technology syllabus will be assessed in 2012.

## 2. ASSESSMENT OBJECTIVES

For purposes of assessment, the behavioural outcomes of instruction in the prescribed content have been classified into three broad skill areas known as assessment objectives. Brief descriptions of the assessment objectives are given below.

### **Assessment Objective 1: Understanding of Technical Principles and Concepts**

**Candidates will be assessed on their ability to recall and understand;**

- 1.1 technological effects on society and the environment;
- 1.2 the significance of ICT in design activities;
- 1.3 various processes used to manipulate resistant materials;
- 1.4 basic principles and concepts of Design and Technology;
- 1.5 positive values and attitudes.

### **Assessment Objective 2: Application of Technical Principles and Concepts**

**Candidates will be assessed on their ability to;**

- 2.1 use various processes to manipulate resistant materials;
- 2.2 communicate ideas clearly in verbal, written and graphical form;
- 2.3 manipulate materials, tools and equipment safely;
- 2.4 execute sound fabrication skills in making high quality products;
- 2.5 exercise cost effectiveness in selection of materials when making artifacts;
- 2.6 cost and market their products;
- 2.7 demonstrate a range of positive values and attitudes.

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## **Assessment Objective 3: Problem Solving**

**Candidates will be assessed on their ability to;**

- 3.1 incorporate technological concepts, systems and control in problem solving;
- 3.2 demonstrate creativity in their work as they solve real life problems;
- 3.3 make informed decisions when designing and making useful products;
- 3.4 incorporate indigenous materials in their design products.

# DESIGN AND TECHNOLOGY SCHEME OF ASSESSMENT

## 3. SCHEME OF ASSESSMENT

The JCE Design and Technology syllabus will be assessed through two written papers and centre-based assessment.

| Paper 1     |               | Multiple Choice Items |           |
|-------------|---------------|-----------------------|-----------|
| <b>Time</b> | <b>1 hour</b> | <b>Marks</b>          | <b>40</b> |
| Weighting   | 20%           |                       |           |

This will be a 40 item multiple-choice paper assessing knowledge, understanding and application of Design and Technology concepts. Each item will have four options.

## DESIGN AND TECHNOLOGY SCHEME OF ASSESSMENT

| Paper 2   |         | Short-Answer and Structured Items |    |
|-----------|---------|-----------------------------------|----|
| Time      | 2 hours | Marks                             | 60 |
| Weighting | 40%     |                                   |    |

This will be a written paper assessing knowledge, understanding and application of Design and Technology concepts, including handling equipment, design and problem solving skills. There will be two sections in the paper, that is, Sections **A** and **B**.

**Section A:** This section will present short-answer items assessing candidates' ability to express themselves while demonstrating in-depth knowledge of particular concepts of the subject. Candidates will answer **all** questions. This section will be worth **20 marks**.

**Section B:** This section will present four structured items of 10 marks each assessing candidates' ability to present their thoughts in a constructive, logical and consistent manner while drawing on knowledge of problem solving and applying it to real life situations. This section will be worth **40 marks**.

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### Centre-Based Assessment

|                  |                                    |              |           |
|------------------|------------------------------------|--------------|-----------|
| <b>Time</b>      | <b>January to August in Form 3</b> | <b>Marks</b> | <b>80</b> |
| <b>Weighting</b> | <b>40%</b>                         |              |           |

The purpose of this component is to afford candidates the opportunity to demonstrate their ability to apply design and technological skills and concepts as well as problem solving skills over a period of time. Each candidate will be required to work on a project that will produce a portfolio and a product. Both the portfolio and the product must be submitted for a grade to be awarded. Candidates will be assessed by teachers during the course of study.

Candidates will be required to design and make suitable products, which conform to a given theme to be provided by Botswana Examinations Council (BEC) at the end of year 2. The product should be completed by mid August of the final year.

Marks awarded by the centre will be moderated by BEC.

*Note: See Appendix A for marking criteria for the portfolio and Appendix B for marking criteria for the product.*

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## APPENDIX A: MARKING CRITERIA FOR PORTFOLIO

| <i>Topic</i> | <i>Skill</i>                                    | <i>Levels of Response</i>   | <i>Mark</i> | <i>Max<br/>Mark</i> |  |
|--------------|---|---|-------------|---------------------|--|
| <b>Theme</b> | Demonstrate a clear understanding of the theme. | No analysis of the theme  | 0           | <b>10</b>           |  |
|              |   | Definition and source   | 1           |                     |  |
|              |   | Correct illustration of <b>three</b> products/activities related to the aspects. ( <i>at least <b>one</b> product/activity per aspect</i> ) | 3           |                     |  |
|              |   | Correct explanation of <b>three</b> products/activities. ( <i>at least <b>one</b> product/activity per aspect</i> )                         | 3           |                     |  |
|              |   | Examination of <b>one</b> area of interest  |             |                     |  |
|              |   | No area examined  | 0           |                     |  |
|              |   | <b>One</b> area examined  | 2           |                     |  |
|              |   | Evidence of understanding the theme   | 1           |                     |  |

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| <b>Topic</b>     | <b>Skill</b>                               | <b>Levels of Response</b>   | <b>Mark</b> | <b>Max. Mark</b> |
|------------------|--|---|-------------|------------------|
| <b>Situation</b> | Derive a situation from the theme analysis | No statement of the situation   | 0           | <b>2</b>         |
|                  |  | Clear statement of the situation                                      | 1           |                  |
|                  |  | Clear statement of the situation that relates to the area of interest | 1           |                  |
| <b>Problem</b>   | Identify a problem from the situation.     | No statement of the problem.  | 0           | <b>2</b>         |
|                  |  | Clear statement of the problem  | 1           |                  |
|                  |  | Clear statement of the problem that relates to the situation          | 1           |                  |
| <b>Brief</b>     | Formulate a brief from the problem.        | No statement of the brief/<br>Preconceived/naming the product         | 0           | <b>2</b>         |
|                  |  | Clear statement of the brief  | 1           |                  |
|                  |  | Clear and concise statement of intent that relates to the problem     | 1           |                  |

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| <i>Topic</i>          | <i>Skill</i>  | <i>Levels of Response</i>                     | <i>Mark</i> | <i>Max. Mark</i> |
|-----------------------|---|---|-------------|------------------|
| <b>Specifications</b> | Formulate relevant specifications in order to guide the design activity | No specifications/<br>irrelevant/ unjustified | 0           | <b>5</b>         |
|                       |   | <b>One</b> specification                      | 1           |                  |
|                       |   | <b>Two</b> specifications                     | 2           |                  |
|                       |   | <b>Three</b> specifications                   | 3           |                  |
|                       |   | <b>Four</b> specifications                    | 4           |                  |
|                       |   | <b>Five or more</b> specifications            | 5           |                  |

| <i>Topic</i>                | <i>Skill</i>   | <i>Levels of Response</i>   | <i>Mark</i> | <i>Max. Mark</i> |
|-----------------------------|--|---|-------------|------------------|
| <b>Exploration of ideas</b> | Generate a variety of possible solutions to a given problem. | No solution / irrelevant  | 0           | <b>6</b>         |
|                             |  | <b>Two</b> existing ideas analysed  | 1           |                  |
|                             |  | <b>Two</b> different initial ideas  | 2           |                  |
|                             |  | <b>Candidates must have two different initial ideas to be considered for the marks below:</b> |             |                  |
|                             |  | Graphical illustration  | 1           |                  |
|                             |  | Function  | 1           |                  |
|                             |  | Justification of chosen idea  | 1           |                  |

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| <i>Topic</i>                          | <i>Skill</i>   | <i>Levels of Response</i>                             | <i>Mark</i> | <i>Max. Mark</i> |  |
|---------------------------------------|--|---|-------------|------------------|--|
| <b>Development of chosen solution</b> | Show logical progression of all the aspects of development | No development of chosen solution.                    | 0           | <b>8</b>         |  |
|                                       |  | <b>Methods of construction</b>                        |             |                  |  |
|                                       |  | Alternative methods considered                        | 1           |                  |  |
|                                       |  | Justification of choice                               | 1           |                  |  |
|                                       |  | <b>Materials</b>                                      |             |                  |  |
|                                       |  | Alternative materials considered                      | 1           |                  |  |
|                                       |  | Justification of choice                               | 1           |                  |  |
|                                       |  | <b>Safety</b>   |             |                  |  |
|                                       |  | No safety consideration                               | 0           |                  |  |
|                                       |  | Some safety consideration                             | 1           |                  |  |
|                                       |  | <b>Presentation drawing</b>                           |             |                  |  |
|                                       |  | pictorial drawing not rendered                        | 0           |                  |  |
|                                       |  | pictorial drawing well rendered but not proportioned  | 1           |                  |  |
|                                       |  | pictorial drawing well rendered and proportioned      | 2           |                  |  |
|                                       |  | Logical progression of all aspects of the development | 1           |                  |  |

## DESIGN AND TECHNOLOGY SCHEME OF ASSESSMENT

| <i>Topic</i>   | <i>General Objectives</i>                                      | <i>Levels of Response</i>  | <i>Mark</i> | <i>Max. Mark</i> |
|----------------|--|--|-------------|------------------|
| <b>Working</b> | Produce a detailed working drawing using conventional methods. | <b>Working drawing to be done using the presentation drawing</b> |             | <b>4</b>         |
|                |  | No working drawing/irrelevant                                    | 0           |                  |
|                |  | <b>Correct views</b>   |             |                  |
|                |  | Front view   | 1           |                  |
|                |  | End view   | 1           |                  |
|                |  | Plan   | 1           |                  |
|                |  | Dimensions   | 1           |                  |

| <i>Topic</i>           | <i>Skill</i>  | <i>Levels of Response</i>                            | <i>Mark</i> | <i>Max. Mark</i> |
|------------------------|---|--|-------------|------------------|
| <b>Production plan</b> | Produce a detailed and sequential production plan of the intended product | No production plan/irrelevant                        | 0           | <b>6</b>         |
|                        |   | <b>Time allocation</b>                               |             |                  |
|                        |   | Unrealistic/little                                   | 0           |                  |
|                        |   | Realistic  | 1           |                  |
|                        |   | <b>Material list</b>                                 |             |                  |
|                        |   | No material list                                     | 0           |                  |
|                        |   | Parts listed but some items missing/ incorrect sizes | 1           |                  |
|                        |   | All parts listed with correct sizes                  | 2           |                  |
|                        |   | <b>Tools</b>   |             |                  |

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|  |  |                                   |   |  |
|--|--|-----------------------------------|---|--|
|  |  | No tools mentioned/insufficient   | 0 |  |
|  |  | Sufficient tools mentioned        | 1 |  |
|  |  | <b>Sequential production plan</b> |   |  |
|  |  | - No sequence                     | 0 |  |
|  |  | - Little planning                 | 1 |  |
|  |  | - Adequate planning               | 2 |  |

| <i>Topic</i>        | <i>Skill</i>   | <i>Levels of Response</i>         | <i>Mark</i> | <i>Max. Mark</i> |
|---------------------|--|-----------------------------------|-------------|------------------|
| <b>Presentation</b> | Present all components of the portfolio in a clear, attractive and logical way | No portfolio                      | 0           | <b>5</b>         |
|                     |  | <b>Presentation techniques</b>    |             |                  |
|                     |  | <b>Four to five</b> techniques    | 1           |                  |
|                     |  | <b>Six or more</b> techniques     | 2           |                  |
|                     |  | Sequencing of the design process  | 1           |                  |
|                     |  | Good written communication skills | 1           |                  |
|                     |  | Portfolio presentation            | 1           |                  |

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### APPENDIX B: MARKING CRITERIA FOR PRODUCT

| <i>Topic</i>                   | <i>Skill</i>                                   | <i>Levels of Response</i>                                  | <i>Mark</i> | <i>Max. Mark</i> |
|--------------------------------|--|--|-------------|------------------|
| <b>Suitability for purpose</b> | Show how the outcomes satisfy the requirements | Does not meet the requirements of the brief/specifications | 0           | <b>5</b>         |
|                                |  | Meets the brief  | 1           |                  |
|                                |  | Meets <b>one</b> specification                             | 1           |                  |
|                                |  | Meets <b>two</b> specifications                            | 2           |                  |
|                                |  | Meets <b>three</b> specifications                          | 3           |                  |
|                                |  | Meets <b>four or more</b> specifications                   | 4           |                  |

| <i>Topic</i>                | <i>Skill</i>              | <i>Levels of Response</i>        | <i>Mark</i> | <i>Max. Mark</i> |
|-----------------------------|---------------------------|----------------------------------|-------------|------------------|
| <b>Manufacturing skills</b> | Produce a quality product | <b>Range of skills displayed</b> |             | <b>16</b>        |
|                             |                           | 1 - 3 skills                     | 1           |                  |
|                             |                           | 4 skills                         | 2           |                  |
|                             |                           | 5 skills                         | 3           |                  |
|                             |                           | 6 or more skills                 | 4           |                  |
|                             |                           | <b>Standard of making skills</b> |             |                  |
|                             |                           | Unacceptable                     | 0           |                  |
|                             |                           | Low                              | 1           |                  |
|                             |                           | Limited                          | 2           |                  |
|                             |                           | Good                             | 4           |                  |

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|  |  |                                |   |
|--|--|--------------------------------|---|
|  |  | Proficient                     | 6 |
|  |  | <b>Construction methods</b>    |   |
|  |  | All appropriate                | 1 |
|  |  | <b>Precision and accuracy</b>  |   |
|  |  | Minor inaccuracies             | 1 |
|  |  | Accurate and precise           | 2 |
|  |  | <b>Safety considerations</b>   |   |
|  |  | All safety aspects considered  | 1 |
|  |  | <b>Appearance</b>              |   |
|  |  | Finish not well done           | 1 |
|  |  | Aesthetically appealing finish | 2 |

| <i>Topic</i>            | <i>Skill</i>  | <i>Levels of Response</i>          | <i>Mark</i> | <i>Max. Mark</i> |
|-------------------------|---|------------------------------------|-------------|------------------|
| <b>Use of materials</b> | Make sound judgment in choice of materials                        | <b>Use of materials</b>            |             | <b>2</b>         |
|                         |   | Not economic and unsuitable        | 0           |                  |
|                         |   | Economic                           | 1           |                  |
|                         |   | suitable                           | 1           |                  |
| <b>Evaluation</b>       | Appraise their products in line with the brief and specifications | No evaluation/irrelevant           | 0           |                  |
|                         |   | <b>Reference to brief</b>          |             |                  |
|                         |   | No reference made                  | 0           |                  |
|                         |   | Reference made                     | 1           |                  |
|                         |   | <b>Reference to specifications</b> |             |                  |

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|  |  |   |          |
|--|--|---|----------|
|  | No reference made                          | 0 | <b>7</b> |
|  | Reference made to 1-3 specifications       | 1 |          |
|  | Reference made to 4-5 specifications       | 2 |          |
|  | <b>Evidence of testing</b>                 |   |          |
|  | No evidence of testing/superficial testing | 0 |          |
|  | Some testing done                          | 1 |          |
|  | Testing done with objectivity              | 2 |          |
|  | <b>Modifications</b>                       |   |          |
|  | No acknowledgement made                    | 0 |          |
|  | Acknowledgement made                       | 1 |          |
|  | <b>Improvements</b>                        |   |          |
|  | None suggested                             | 0 |          |
|  | Some suggested and explained               | 1 |          |