

## 22.0 DRAWING AND DESIGN (449)

The Drawing and Design examination for 2009 consisted of a theory and practical paper. The former constituted 60% of the total mark while the latter constituted 40% of the final mark. This report outlines the candidates' performance in Drawing and Design in the year 2009.

### 22.1 CANDIDATES' OVERALL PERFORMANCE

*Table 27: Candidates' Overall Performance in Drawing and Design for the Years 2009, 2008 and 2005.*

Year	Paper	Candidature	Max. Score	Mean Score	Standard Deviation
2005	1		60	27.72	10.60
	2		40	23.29	5.94
	<b>Overall</b>	<b>1,324</b>	<b>100</b>	<b>51.00</b>	<b>14.00</b>
2008	1		60	20.42	10.51
	2		40	26.16	5.87
	<b>Overall</b>	<b>19</b>	<b>100</b>	<b>46.58</b>	<b>15.44</b>
2009	1		60	26.31	13.12
	2		40	20.44	7.53
	<b>Overall</b>	<b>313</b>	<b>100</b>	<b>46.75</b>	<b>18.49</b>

From the table above, the following observations can be made:

22.1.1 The number of the candidates rose significantly from **19** in **2008** to **313** in **2009**.

22.1.2 Although the mean scores for **2008** and **2009** were almost identical, there was a slight improvement in the standard deviation from **15.44** to **18.49**.

The questions which were poorly done will be discussed in the following report:

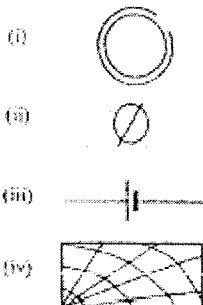
### 22.2 PAPER 1 (449/1)

#### Question 2

(a) Sketch each of the following conventions:

- (i) hidden details;
- (ii) folding line;
- (iii) centre line;
- (iv) cutting plane.

(b) State the meaning of each of the following conventions:

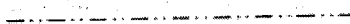





The candidates were required to sketch four different types of lines and indicate what the given

conventions denote.

The lines given are normally used in technical drawing on daily basis yet some candidates were unable to come up with the correct responses in part (a). In question 2(b), most candidates were not familiar with the thread and timber conventions.

### Expected responses

- (a) Lines
- |   |               |
|---|---------------|
|  | Folding       |
|  | Hidden        |
|  | Centre        |
|  | Cutting plane |

### (b) CONVENTIONS

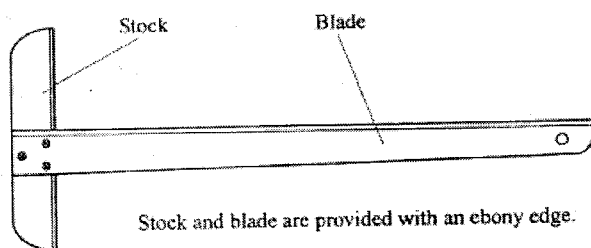
- (i) external thread
- (ii) diameter
- (iii) battery or cell
- (iv) planed timber

### Question 3

With the aid of sketches, describe the use and construction of a tee-square indicating the materials used.

This question required the candidates to show how a tee-square is constructed and describe its use. Most of the candidates did not know the unique features of a tee-square despite the fact that it is one of the major tools used in technical drawing. The names of the blade and stock were expected to be given in the sketch and chamfered edge and right angle between the stock and blade shown.

### Expected response

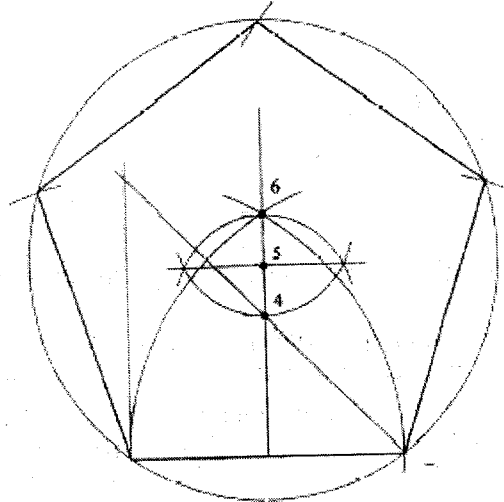


### Question 5

Construct a regular pentagon given that the length of one side is 45mm.

The candidates were required to draw a regular pentagon based on the information given. Most of the candidates lacked the expected knowledge on how to construct a regular pentagon. Construction of regular polygons is a major topic in plane geometry and students should take time to master the procedure of construction of various polygons including a pentagon.

**Expected response**



**Question 9**

Figure 4 shows the three views of a bracket, drawn in first angle projection.

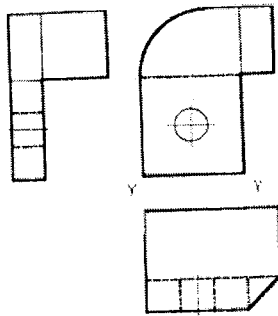


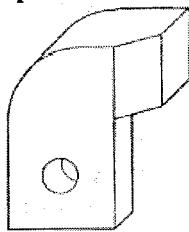
Figure 4

Sketch an oblique view of the bracket with Y-Y as the lowest edge.

This question required the candidates to sketch an oblique view of a bracket whose orthographic views were given.

The main weakness displayed by the candidates in this question was lack of subject mastery in translating orthographic views into oblique as required. Some candidates came up with just a pictorial drawing without observing the characteristics of an oblique drawing.

**Expected response**



**Question 10**

Figure 5 shows an isometric view of a machined block.

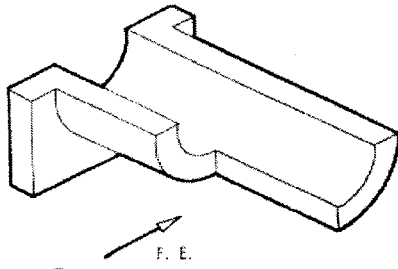
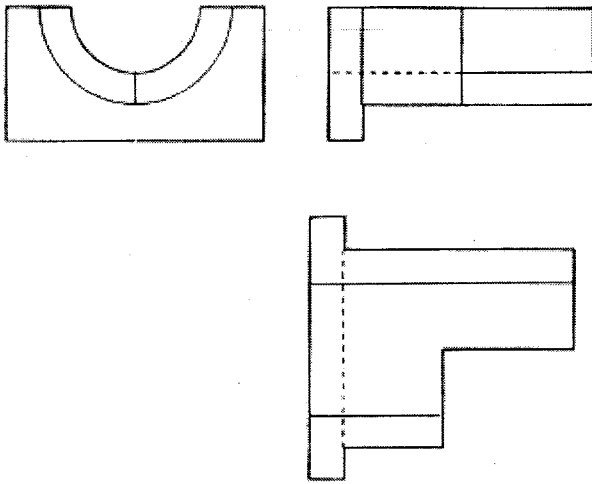


Figure 5

Sketch the orthographic views of the block in first angle orthographic projection.

In this question, the candidates were required to convert an isometric drawing into orthographic views. Most of the responses given did not have the required details including the hidden lines. Some candidates also overlooked the requirement of presenting the orthographic views in first angle projection. A high degree of neatness and proportionality was expected even when the views were to be sketched.

#### Expected response



### 22.3 PAPER 2 (449/2)

This paper always comprises one design question which must be attempted by all the candidates. The candidates were required to design a piece of furniture that can be used as a seat and also a bed and had to incorporate the following considerations:

- should be collapsible and portable
- should have features to allow comfort when seated and prevent falling off when sleeping
- should accommodate people of different heights.

The candidates were expected to present rough sketches for two possible designs, then select one of the sketches and refine it into a proportional pictorial drawing. The candidates were also expected to sketch suitable mechanisms to cater for each of the three considerations outlined in the design problem. The materials used and joining methods were part of the expected responses.

#### Weaknesses

The main weaknesses observed include the following:

- Wrong interpretation of the design problem.
- Failure to sketch neat, proportional and appropriate drawings to represent the expected features.

- Inability to present clear and functional mechanisms.

## **22.4 ADVICE TO TEACHERS**

- 22.4.1 Teachers should ensure that the entire syllabus is covered including minor topics like joining methods and materials.
- 22.4.2 The students will require a lot of time to perfect their skills in sketching and presenting various ideas in drawing form.
- 22.4.3 Neatness and proportionality should be emphasized in all the drawings presented.
- 22.4.4 Candidates should be given sufficient practice in sketching and drawing including exploded and assembly drawing.