

3.7 DRAWING AND DESIGN (449)

The Drawing and Design examination for 2012 consisted of two papers namely Paper 1, a theory and Paper 2, a practical paper. The theory paper constituted **60%** while the practical paper constituted **40%** of the final mark. The revised syllabus was tested for the first time with the format and weighting changed for paper 1. The format and weighting for paper 2 was the same as for the previous years.

Candidates' Overall Performance

Table 14: *Candidates' Overall performance for the Years 2008, 2009, 2010, 2011 and 2012*

Year	Paper	Candidature	Maximum score	Mean score	Standard Deviation
2008	1		60	20.42	10.51
	2		40	26.16	5.87
	Overall	19	100	46.58	15.44
2009	1		60	26.31	13.12
	2		40	20.44	7.53
	Overall	313	100	46.75	18.49
2010	1		60	27.93	12.09
	2		40	22.22	6.49
	Overall	307	100	50.15	14.79
2011	1		60	31.52	10.17
	2	428	40	24.17	7.00
	Overall		100	55.68	15.21
2012	1		60	32.61	11.67
	2	420	40	27.17	5.62
	Overall		100	59.79	15.59

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

- (i) The candidature decreased from 428 in 2011 to 420 in 2012.
- (ii) The mean score for paper 1 increased from 31.52 to 32.61 while that of paper 2 increased from 24.17 to 27.17
- (iii) The combined mean score increased from 55.68 to 59.79 showing an improvement in performance.

3.7.1 Drawign and Design Paper 1 (449/1)

The following analysis examines individual questions where poor performance was recorded in the paper. The questions include **1, 3, 5, 6, 7, 11, 14.**

Question 1(a)

Give the following information regarding parastatal organizations in Kenya with respect to:

- (i) Ownership
- (ii) Management
- (iii) Services

Candidates were tested on information regarding parastatals in Kenya which falls under the topic career information.

Weakness

Most candidates were unable to differentiate between parastatals and private companies.

Advice to Teachers

They should teach all the topics in the syllabus without assuming any.

Expected responses

- i. Ownership- they are largely owned by the government
- ii. Management- they are managed by government appointees
- iii. Services –they provide services to the customers who find it expensive to afford them if they are left to private establishments.

Question 3 (b)

Describe each of the following manufactured boards:

- (i) Plywood
- (ii) Chip board
- (iii) Block board

Most candidates were not able to answer this question.

Advice to Teachers

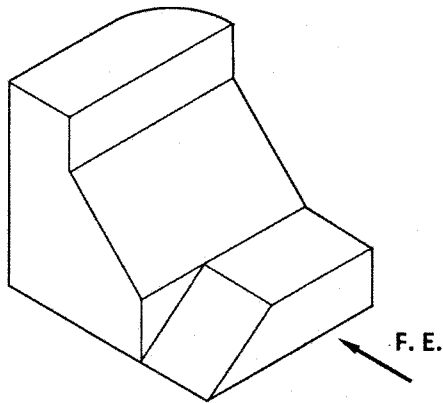
They should organize for education trips to industries where these boards are manufactured to expose students to these boards.

Expected responses

- (i) Ply woods are made thin sheets of wood (veneers) that are glued together with the grain of each layer perpendicular to the next.
- (ii) Chipboards are manufactured by compressing chips of wood which are then glued to the required density.
- (iii) Block boards are made up of blocks of timber joined on edge and faced suitably with plywood on both faces.

Question 5

Figure 2 shows a pictorial view of a block.



Using third angle projection, sketch in good proportion the orthographic views of the block.

The question tested the candidates on the skill of interpreting from pictorial to orthographic projection.

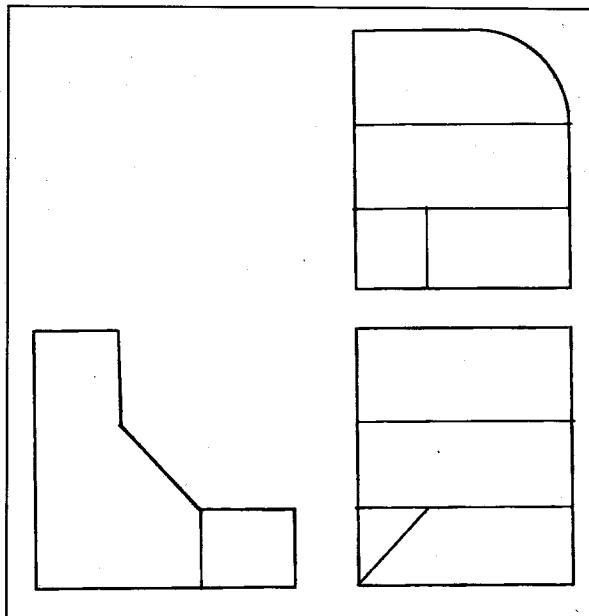
Weakness

Some candidates could not differentiate between first angle and third angle projection.

Advice to Teachers

They should give students more questions to practice on orthographic projection.

Expected responses



Question 6

Figure 3 shows two views of a block drawn in first angle projection. In good proportion sketch the block in oblique projection.

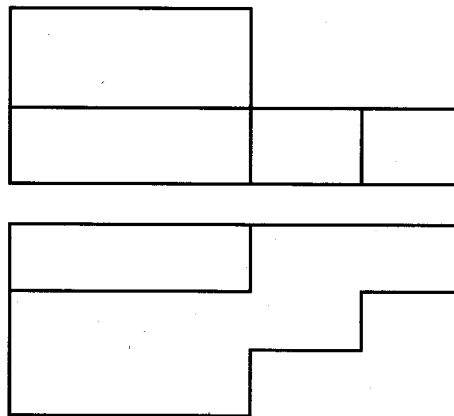


Figure 3

Candidates were expected to sketch in good proportion the oblique view of a block whose two views were given in first angle orthographic projection.

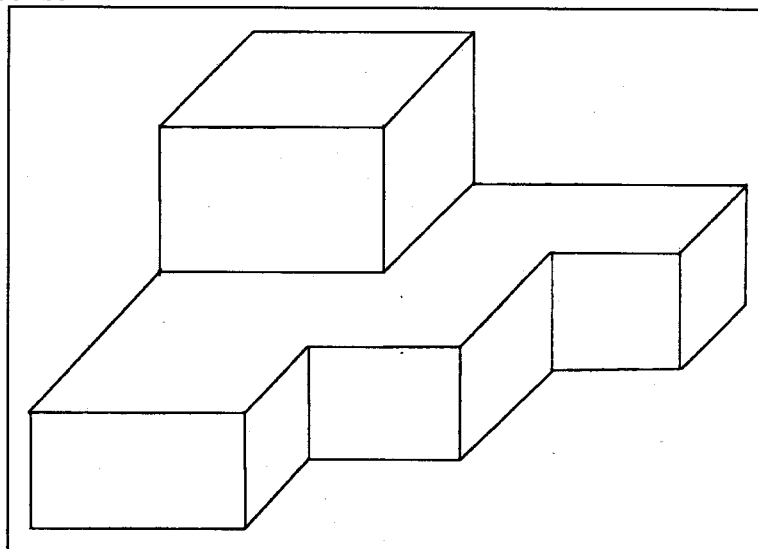
Weakness

Some candidates confused between first angle and third angle projection while some mixed up the angle for the receding side.

Advice to teachers

They should teach pictorial drawings thoroughly and explain to the students the differences between oblique and isometric drawings with the aid of drawings.

Expected response



Question 7

Construct an internal common tangent to the circles given in figure 4

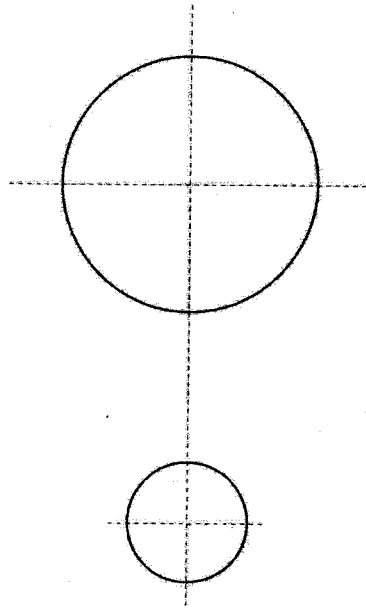


Figure 4

Candidates were tested on the construction of an internal common tangent to the circles as given in the question.

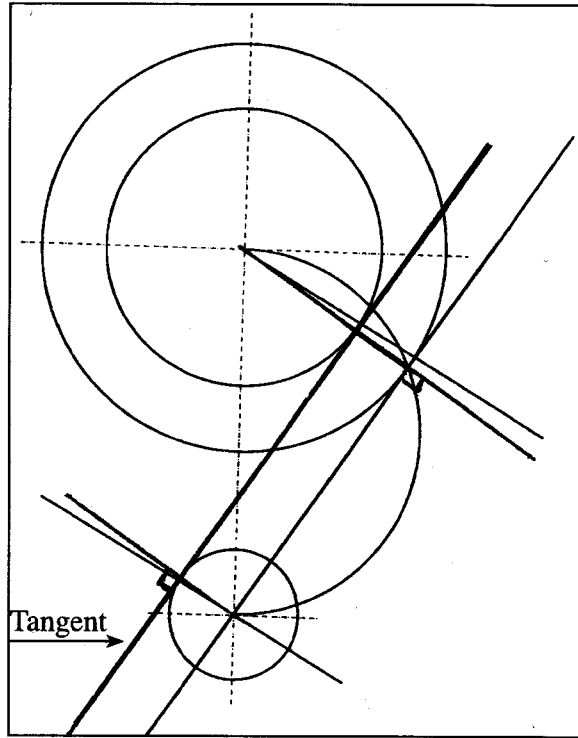
Weakness.

Some candidates confused between internal and external tangent.

Advice to Teachers

They should give students more questions on construction of tangents for practice.

Expected Response:



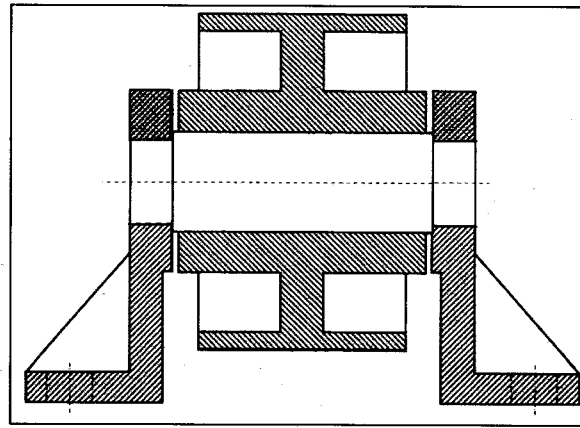
Question 11

Figure 7 shows parts of a machined component drawn in first angle projection.

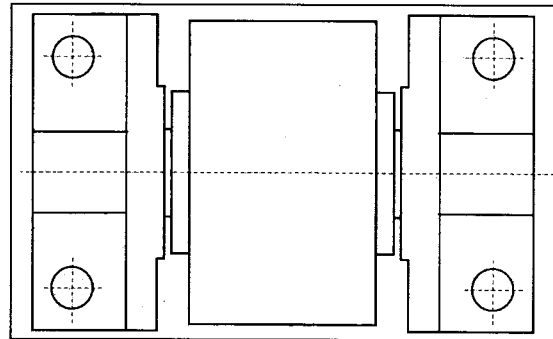
Assemble the parts and draw the following:

- a) Sectional front elevation through the cutting plane F-F
- b) The plan

Expected Responses.



SECTIONAL FRONT ELEVATION ALONG F-F



PLAN Figure

Question 14

Figure 10 shows a branch pipe A connected to a conical shaped base of a chimney B.

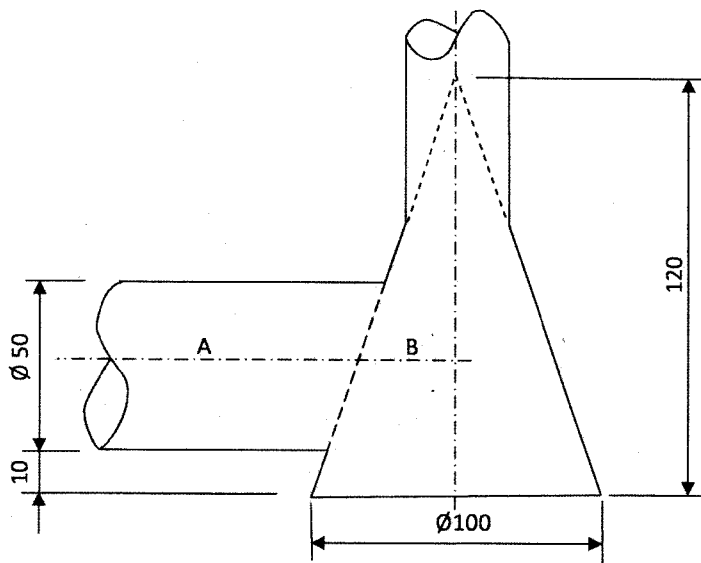


Figure 10

Draw the curves of interpenetration between the pipe and the conical base in:

- a) Plan
- b) Elevation

Candidates were tested in drawing the curves of interpenetration between different solids.

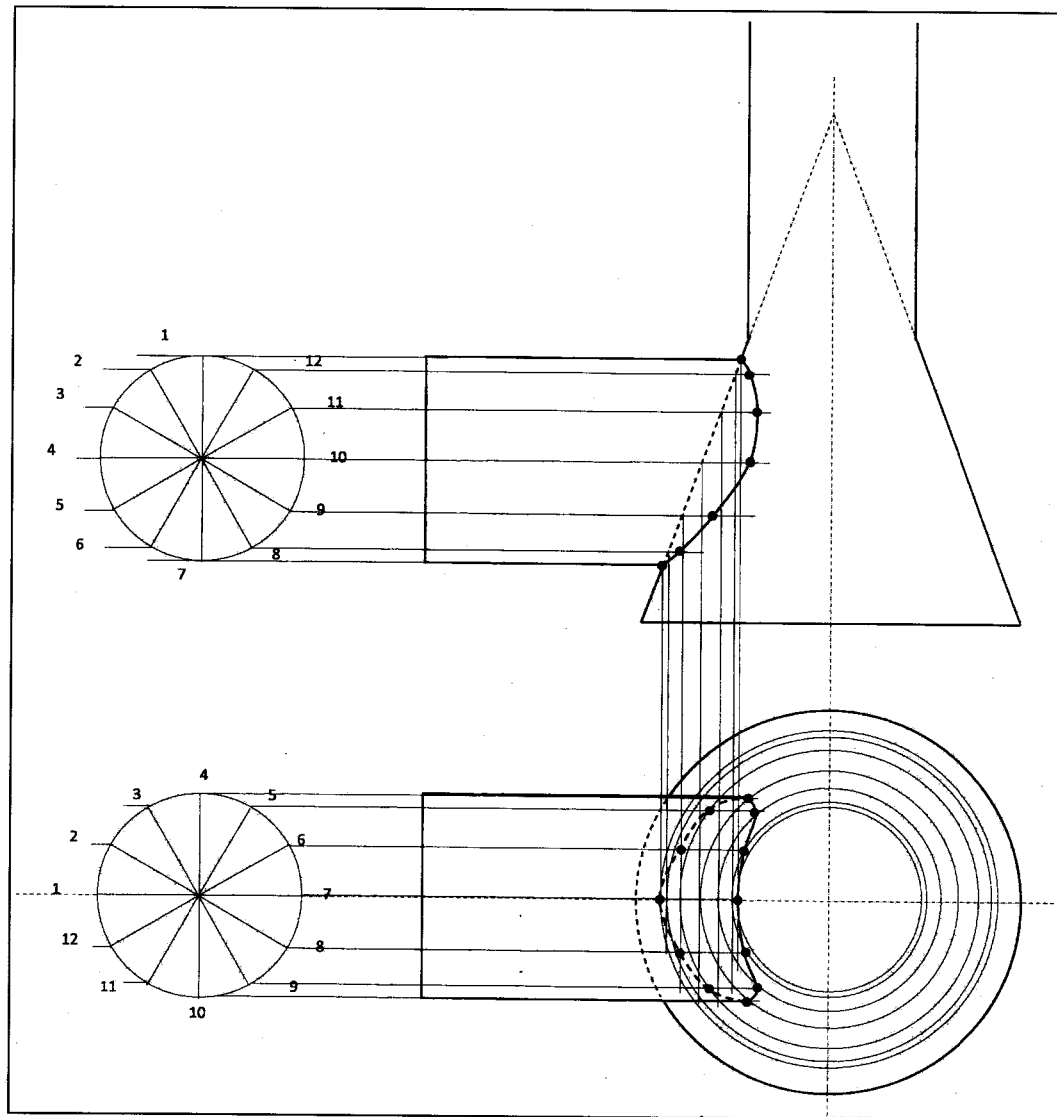
Weakness

Some candidates were unable to complete the question while most of them did not attempt the question.

Advice to Teachers

They should give students more practice on drawing the curves of interpenetration between different solids.

Expected Responses



3.7.2 Drawing and Design Paper 2 (449/2)

This paper is always composed of one design question which must be attempted by all candidates. In the year 2012, the question required the candidates to design a device to hold several hanging lines with the following considerations:

- It should be collapsible for ease of movement and storage.
- It should be stable and strong enough to hold clothes to dry.
- It should be adjustable to different heights

In their responses, the candidates were expected to present rough sketches of two possible designs. In the second requirement, the candidates were to select one of the two possible designs and refine it into an exploded pictorial sketch.

The third requirement called for the candidates to make detailed sketches of suitable mechanisms to cater for each considerations cited above.

In the fourth requirement candidates were expected to list materials used in the device and state the reason for their choice.

In the fifth requirement candidates were to list two methods used to join the parts.

Weaknesses

The following weaknesses were observed in candidate's work.

- (i) Presenting detailed exploded sketches to show various considerations.
- (ii) Drawing clear refined pictorial sketches.
- (iii) Making detailed exploded sketches to show suitable mechanisms.
- (iv) Differentiating between different materials used in design
- (v) Identifying different methods of joining different parts.

Advice to Teachers

- (i) Teach the students different types of designs and allow them to come up with sophisticated designs of their own.
- (ii) Engage the students in drawing refined pictorial sketches.
- (iii) Give students enough questions to practice on drawing exploded views of different designs.
- (iv) Teach the students different materials and expose them to commonly used materials.
- (v) Teach the entire syllabus including topics like materials and methods of joining different parts of objects.