

3.7 DRAWING AND DESIGN (449)

The drawing and Design examination for 2014 was tested in two papers; paper 1(449/1) and paper 2 (449/2). Paper 1 was a theory paper which constituted 60% of the final mark while Paper 2 was a practical paper which constituted 40% of the final mark. Both papers followed the usual setting format as those of the previous years.

CANDIDATES' OVERALL PERFORMANCE

Table 15: Candidates overall performance in the years 2009 to 2014

Year	Paper	Candidature	Max. Score	Mean Score	Standard Deviation
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	24.17	7.00
	Overall		100	55.68	15.21
2013	1		60	28.94	11.60
	2	483	40	27.52	6.34
	Overall		100	56.45	16.39
2014	1		60	36.82	10.21
	2	473	40	30.13	5.61
	Overall		100	66.95	14.09

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

- (i) The candidature dropped from 483 in 2013 to 473 in 2014.
- (ii) The mean score improved from 56.45 to 66.95 while the standard deviation dropped from 16.39 to 14.09

Question 11

Figure 6 shows parts of a machine component drawn in first angle projection. Assemble the parts and draw FULL SIZE the following:

- (a) sectional front elevation along the cutting plane P - P;
- (b) the plan;

Hidden details are not required. Unspecified dimensions are left to the candidate's discretion. (20 marks)

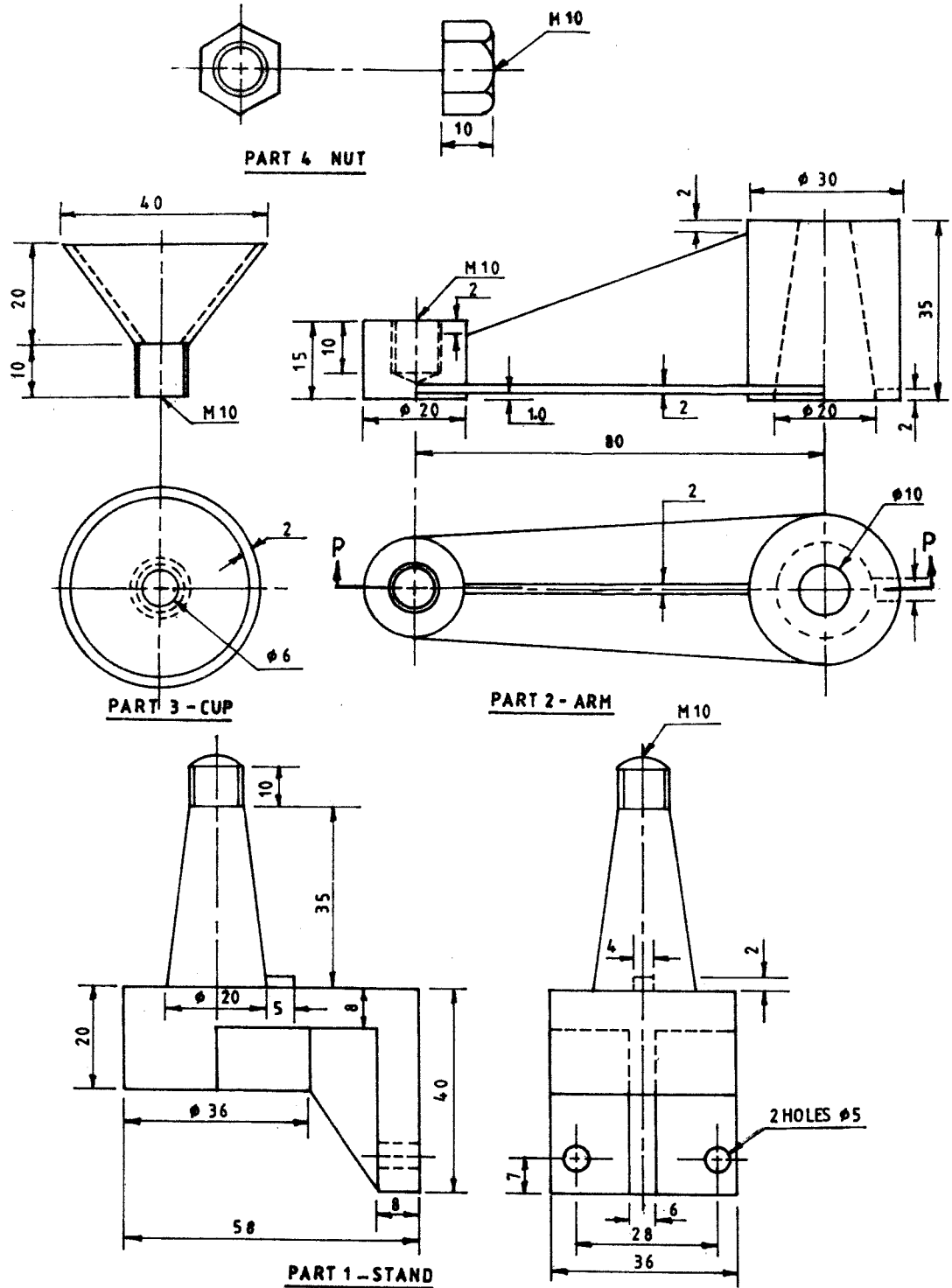


Fig. 6

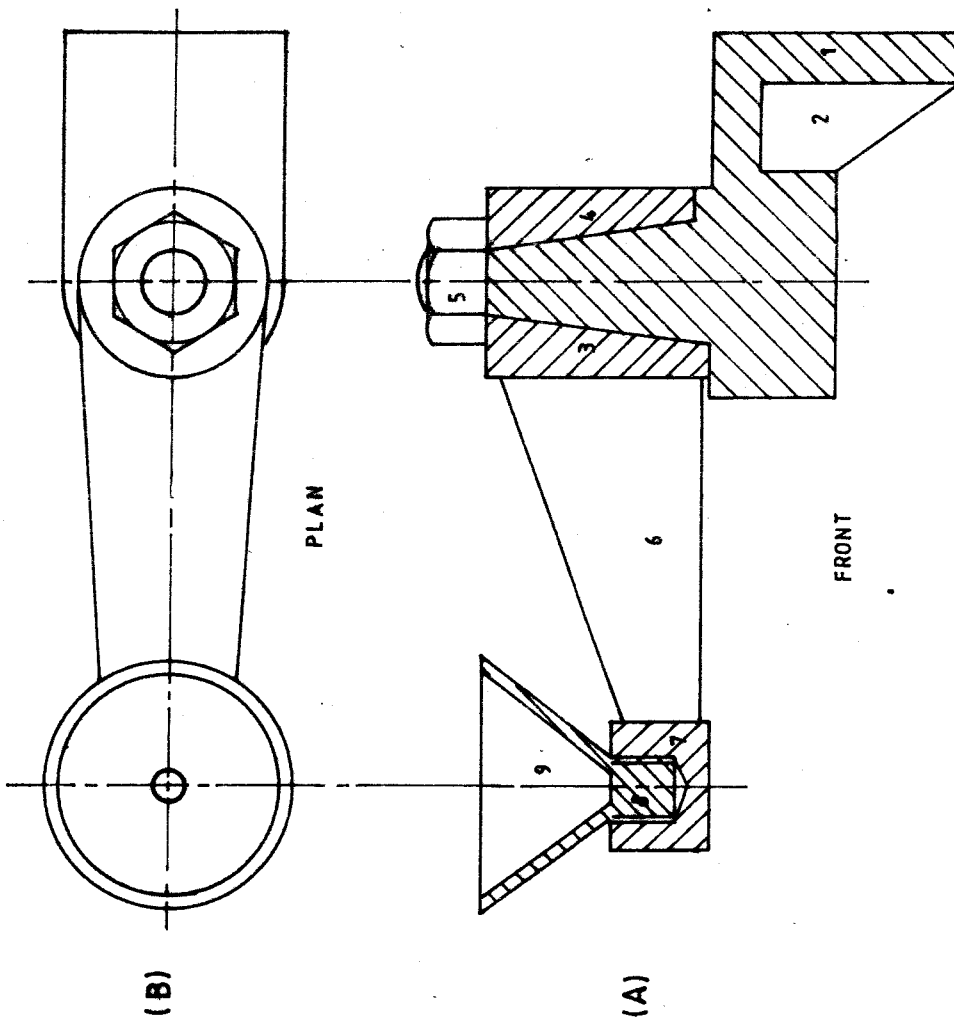
Weakness

A number of candidates were not able to assemble the parts and draw the views stated.

Advice to teachers

Teachers need to expose learner to a lot practice in assembly drawing by giving them assignments to do both in class and take away.

Expected responses



FRONT VIEW	
Faces	9 × 1 = 9
Section	5 × 1/2 = 2 1/2
	= 11 1/2
PLAN	
Faces	8 × 1 = 8
LineWork	= 1/2
	= 8 1/2
TOTAL = 20 marks	

Question 13

Figure 8 shows the plan of an object. A string attached to its circumference is wound tight. Trace the path followed by a mark P on the string as it unwinds through one revolution.

(15 marks)

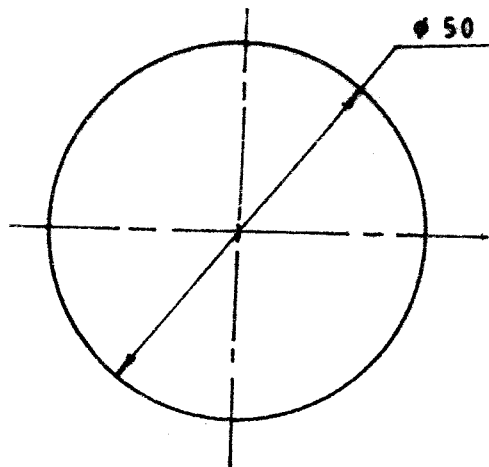


Fig 8

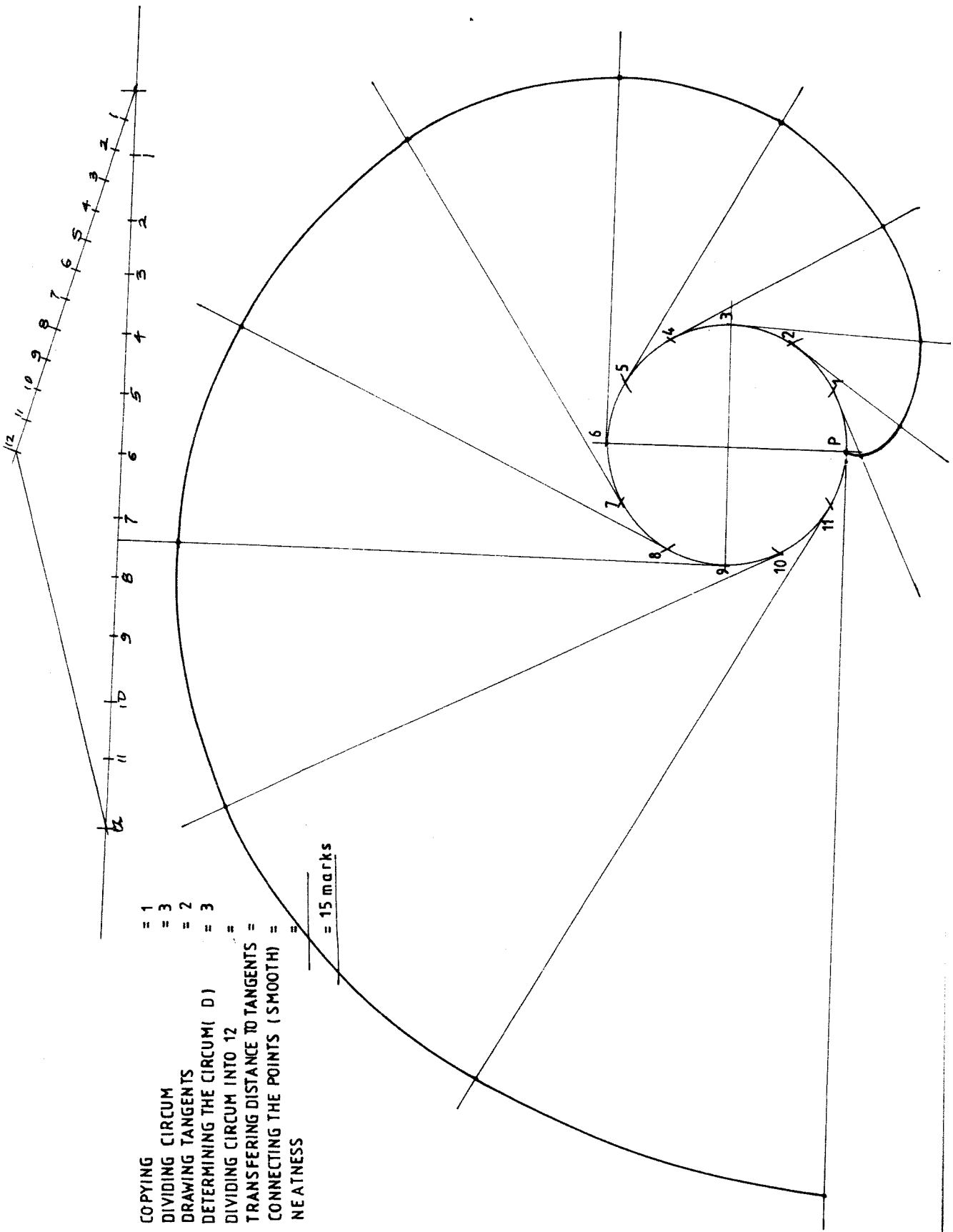
Weakness

Some candidates could not draw the involute as per the question..

Advice to teachers

Teachers are advised to give students more practice in drawing of standard loci and explain where such loci are applicable.

Expected responses



- COPYING = 1
 - DIVIDING CIRCUM = 3
 - DRAWING TANGENTS = 2
 - DETERMINING THE CIRCUM(D) = 3
 - DIVIDING CIRCUM INTO 12 =
 - TRANSFERING DISTANCE TO TANGENTS =
 - CONNECTING THE POINTS (SMOOTH) =
 - NEATNESS =
- = 15 marks

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 the candidates. In the year 2014, the question required the candidates to design a suitable ladder with the following considerations:

- It should provide a reasonably strong grip when leaning on a cylindrical column.
- It should have rungs (steps) that make the user comfortable when working.
- It should have provision for extension as the height increases
- It should have provision for folding for ease of storage and transportation
- It should provide a firm grip to the ground.

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 drawing.

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

Advice to Teachers:

Give the students a lot of practice in sketching exploded views and presenting various ideas in form of drawings.

Candidates also need sufficient exposure to various designs in order to develop the desired concepts.

Teachers should insist on neatness, line work and proportionality in all the drawing assignments given to the students. Teachers should also ensure that the entire syllabus is covered including topics like materials and methods of joining different parts of objects.

If possible they need to organize for academic tips to industry to enable students visualize better how some mechanisms work in manufacturing.