KENYA NATIONAL EXAMINATION COUNCIL
KCSE, 2014

METAL WORK PAPER 1 ANALYSIS

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Osiligi House, Opposite KCB, Ground Floor
Off Magadi Road, Ongata Rongai | Tel: 0711 88 22 27
E-mail:infosnkenya@gmail.com | Website: www.schoolsnetkenya.com

3.3 METAL WORK (445)

The 2014 KCSE examination for Metalwork consisted of two papers namely Paper 1 (theory) and Paper 2 (Practical Project). The theory was worth 60% while practical was worth 40% of the final mark. The format and weighting of the two papers was the same as in the previous years.

Candidates General Performance

Table 11: Candidates' overall performance for the period 2009 up to 2014

Year	Paper	Candidature	Maximum Score	Mean Score	Standard Deviation
2009	1		60	25.38	9.09
	2		40	35.34	3.38
	Overall	**231**	**100**	**58.74**	**13.32**
2010	1		60	22.60	9.09
	2		40	15.25	4.32
	Overall	**222**	**100**	**37.70**	**12.58**
2011	1		60	30.92	9.55
	2	**170**	40	20.65	4.29
	Overall		**100**	**51.57**	**12.43**
2012	1		60	32.01	10.85
	2	**194**	40	21.43	5.48
	Overall		**100**	**53.43**	**15.49**
2013	1		60	32.83	10.84
	2	**157**	40	21.98	5.33
	Overall		**100**	**54.66**	**15.54**
2014	1		60	36.44	8.86
	2	**142**	40	24.33	3.74
	Overall		**100**	**60.77**	**11.58**

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

(i) The mean score improved from 54.66 in the year 2013 to 60.77 in the year 2014.

(ii) The standard deviation dropped from 5.33 in the year 2013 to 3.74 in the year 2014.

(iii) The candidature decreased from 157 in the year 2013 to 142 in the year 2014.

3.3.1 Metalwork Paper 1 (445/1)

The questions which were reported to have been poorly responded to have been analyzed with a view to pointing out candidates' weaknesses and propose suggestions on some remedial measures that need to be taken in order to improve performance in future. The questions for discussions include 5b, 8a, 9b, 11, 13.

Question 5 b

State **three** factors to consider when selecting spelter for brazing. (3 marks)

Weaknesses
Most of the candidates confused between spelter for brazing and gas welding rods.

Advice to teachers
Teachers should explain clearly to students the difference between spelter and welding rods.

Expected Responses

(i) Thickness of the material to be brazed.
(ii) The joint design.
(iii) The method of heating the joint.
(iv) The type of material to be brazed.

Question 8 a

List **four** sources of information related to career choice in a school setting. (2 marks)

Weaknesses
Some candidates could not list the sources of information for career choice.

Advice to teachers
Teachers need to expose students to career opportunities as well as how they can get information on the opportunities.

Expected Responses
(i) Career master/mistress/resource person.
(ii) Handbook for guidance and counselling.
(iii) School career information booklet.
(iv) Local newspapers and magazines.
(v) Internet.

Question 9 b

Outline the annealing process. (2 marks)

Weaknesses
Most candidates could not outline the process of annealing and instead outlined for hardening.

Advice to teachers

Teachers should teach the topic of heat treatment thoroughly and perform some of the processes correctly as required by the syllabus.

Expected response

(i) Heat the metal slowly to bright red.
(ii) Cool slowly (by burying under hot ash).

Question 11

Figure 1 shows orthographic views of a machined block drawn in first angle projection.

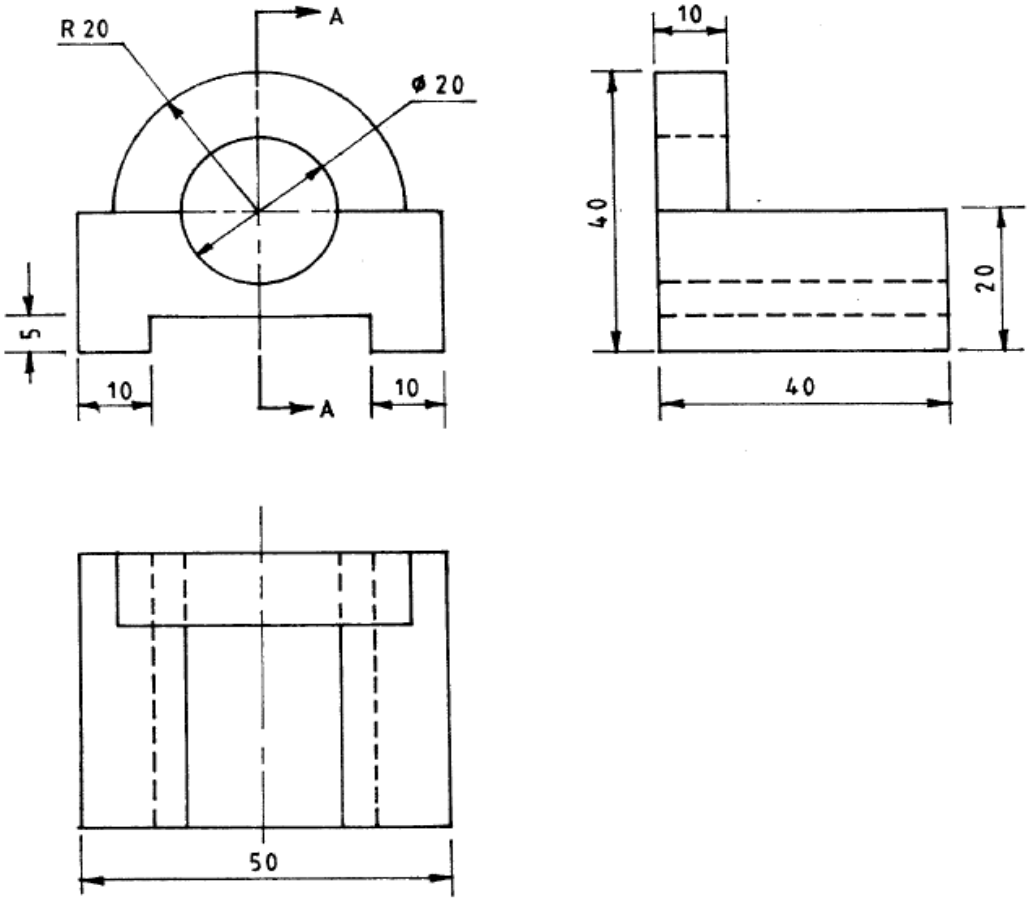


Fig. 1

Draw full size, the following;

(a) the oblique view of the block; (10 marks)

(b) the sectional end elevation through A-A. (5 marks)

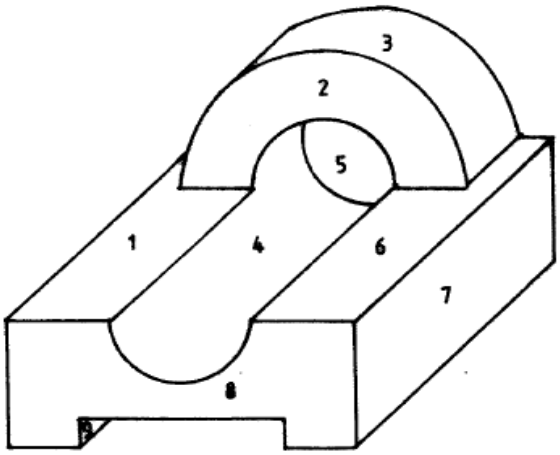
Weaknesses

Most candidates could not draw the machined block in oblique projection while only a few tried to draw the section.

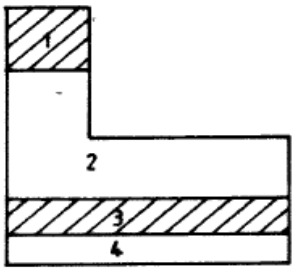
Advice to teachers

Teachers should teach the student how to draw by viewing from different directions and give them enough assignments for them to practice the skill in drawing.

Expected Responses



Faces 9 × 1 = 9
Oblique = 1
= 10 marks



Faces 4 × 1 = 4
Hatching 2 × 1/2 = 1
= 5 marks

Question 13

With the aid of labelled sketches, outline the following lathe procedures:

(a) Drilling (8 marks)

(b) Parting off (7 marks)

Weaknesses

Most candidates did not attempt this question and the few who attempted could not sketch the drilling process.

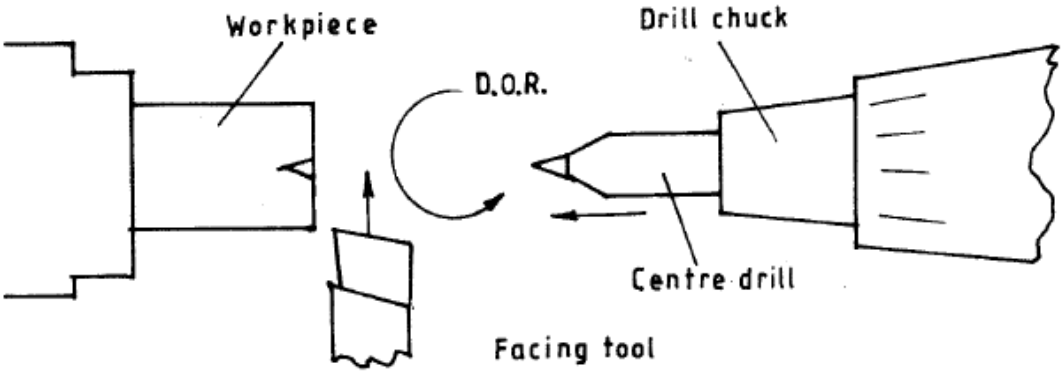
Advice to teachers

Teachers should teach the student all the lathe operations by demonstrating and asking them to draw where necessary.

Expected Responses

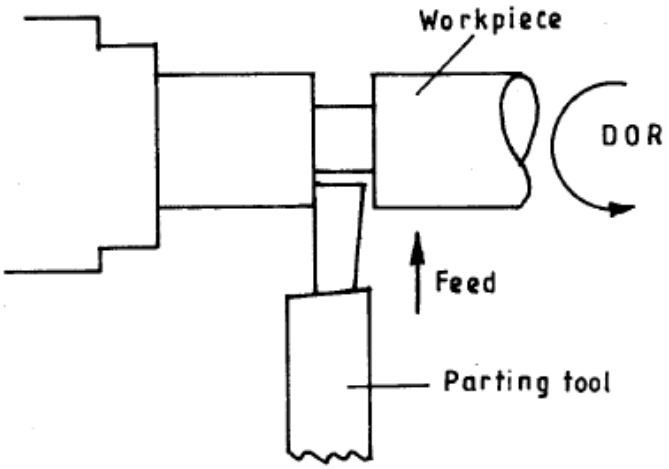
Lathe operations

(i) Drilling



- Face the work.
- Centre drill.
- Fix twist drill.
- Move the tail stock close to the work piece and lock.
- Feed the twist drill into the rotating work.

(ii) Parting off



- Fix workpiece securely in chuck.
- Mark parting point/width.
- Set machine to low speed.
- Set parting tool to correct position.
- Feed the tool slowly.
- Withdraw tool to allow chips to break off and feed again.