



# Machakos University College

(A Constituent College of Kenyatta University)

University Examinations 2013/2014

SCHOOL OF ENGINEERING

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

**Diploma in Building and Technology Module I**

**Surveying and Workshop Technology (Mechanical)**

Date:

Time:

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## Instructions

1. This paper Consists of consist of two section A and Db.
2. Answer Three Questions from section A and Two questions from section A and Two questions form Section B.
3. Each questions carry equal marks.

## SECTION A: SURVYING AND WORKSHOP TECHNOLOGY MECHANICAL

### ATTEMPT ANY THREE QUESTIONS FROM THIS SECTION A

1. (a) Distinguish between the following terms as used in (6 marks)
  - (i) Plane surveying and geodetic surveying
  - (ii) Pacing and chaining
- (b) Outline the four objectives of surveying in Engineering work. (4 marks)
- (c) Briefly outline Five factors that affect the accuracy & survey work. (10 marks)
2. (a) Explain the two principles of surveying. (4 marks)

(b) The staff readings recorded for survey works are as follows.

B.S	I.S	F.S
1.115		
	0.875	
	1.520	
1.855		0.615
	0.735	
	2.245	
	2.435	
0.725		1.715
0.410		0.305

Rule out a page of level field book and enter the readings. Work out the R.Ls of all by Rise and Fall Method if the first readings was taken on a B.M of R.L 115.925.

Find the height of collimation of the instrument of the last position and hence work out the staff reading on a peg to fix it at a R.T. of 116.715. (11marks)

- (c) Briefly describe a direct ranging surveying. (5 marks)
3. (a) Distinguish between geological and Archaeological survey. (4 marks)
- (b) Briefly differentiate between collimation and rise and fall methods of levels. (8 marks)
- (c) With aid of sketched outline FOUR instruments used for setting out right angles in chain surveying. (8 marks)
4. (a) Define the following terms as used in travelling;
- (i) Station
  - (ii) Parallax
  - (iii) Intermediate sight (IS)
  - (iv) Arbitrary bench mark. (8 marks)
- (b) Briefly and with aid of sketches describe indirect chiming on a sloping ground. (8 marks)
- (c) Explain four causes of error in chiming. (4 marks)
5. (a) State the three major functions of a surveyor. (3 marks)
- (b) The following readings have been taken from a page of an old level book. It is required to reconstruct the page. Fill up the missing quantities and apply the final checks.

Stations	BS.	IS	F.S	Rise	Fall	R.L	Remarks
1.	3.125					?	B.M
2	?		?	1.325		125.505	T.P
3		2.320			0.055	?	
4		?				125.850	
5	?		2.655			?	T.P
6	1.620		3.205		2.165	?	T.P
7		3.625				?	
8			?			123.090	T.B.M

(10 marks)

(b) With the aid of sketch illustrate the following chaining accessories; (7 marks)

- (i) Offset rod
- (ii) Ranging rod
- (iii) Optical square

### SECTION B:

#### ATTEMPT ANY TWO QUESTIONS FORM THIS SECTION

6. (a) Outline ten safety regulations to be observed in the workshop. (6 marks)

(b) State six welfare (responsibilities) of an employer. (6 marks)

(c) Name two types of caburrators in relation to engines. (4 marks)

7. (a) Outline six comparisons between a petrol engine and diesel engine (12 marks)

(b) Name two safety items that can be found in a first aid box. (12 marks)

(c) Sketch the following hand tools (6 marks)

- (i) Wooden mallet
- (ii) Claw hammer
- (iii) Hand saw

8. (a) With the aid of diagram, describe the operation mechanism of a TWO stroke cyle spark ignition petrol engine. (10 marks)

(b) Explain the meaning of the following terms as applies to engine. (4 marks)

- (i) T.D.C
- (ii) B.D.C.

(c) Define the term “engine” (3 marks)

(d) Name any 3 parts of an engine

(3 marks)