POLITEKNIK
Jabatan Pengajian Politeknik

EXAMINATION AND EVALUATION DIVISION
DEPARTMENT OF POLYTECHNIC EDUCATION
(MINISTRY OF HIGHER EDUCATION)

CIVIL ENGINEERING DEPARTMENT

FINAL EXAMINATION

JUNE 2012

CC103 : ENGINEERING SURVEY 1

DATE : 23 NOVEMBER 2012
DURATION : 2 HOURS (2.30 – 4.30 PM)

This paper consists of **SIX (6)** pages including the front page.
Section A: Essay (2 questions – answer **ALL** questions)
Section B: Essay (3 questions – answer **2** questions)

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(The CLO stated is for reference only.)

SECTION A

ESSAY (50 marks)
Instruction: This section consists of 2 essay questions. Answer **ALL** questions.

QUESTION 1

a) List **FIVE (5)** branches of survey. [CLO 1: C1]
(5 marks)

b) Explain briefly the purpose of **TWO PEG TEST**. [CLO 2: C2]
(4 marks)

c) Define the following term : [CLO 2: C2]
(4 marks)

i. Change point
ii. Reduced level

d) Data on levelling survey work is given in Table 1.
Calculate: [CLO 3: C3]
i. Height of collimation method. (2 marks)
ii. Reduced level (RL) (3 marks)
iii. Correction and adjustment reduced level (7 marks)

SIGHT			HOC	RL	CORRECTION	ARL	REMARKS
BS	IS	FS					
1.111							TBM 1: 33.20
	1.334						A
	1.230						B
1.654		1.330					C(CP1)
	1.750						D
	2.001						E
		2.091					TBM 2: 32.542

Table 1

QUESTION 2

Table 2 below shows the data of bearing and distance for close traverse. [CLO3 : C3]

Station/Line	Bearing	Distance (m)
1 – 2	$290^0\ 40'\ 00''$	55.000
2 – 3	$341^0\ 24'\ 00''$	50.000
3 – 4	$46^0\ 53'\ 00''$	58.000
4 – 5	$147^0\ 49'\ 00''$	85.000
5 – 1	$210^0\ 00'\ 00''$	40.000

Table 2

Calculate:

i. Latitude and Departure of each station/line.

ii. Latitude and Departure corrections using Transit Method

iii. Coordinate for every station, if at station 1 their coordinate is N 100.000, E 100.000

iv. Traverse area by using the Coordinate Method.

(25 Marks)

SECTION B

ESSAY (50 marks)

Instruction: This section consists of 3 essay questions. Answer **TWO (2)** questions.

QUESTION 1

a) Describe Plane Surveying and Geodetic Surveying in general. [CLO 1: C1]

(3 marks)

b) State **THREE (3)** types of leveling instruments. Briefly explain the differences between the instruments. [CLO 2: C2]

(6 marks)

c) Figure 1 shows a schematic diagram of a leveling work conducted between BM J7812 (RL= 21.816m) and BM J7725 (RL = 24.846m) . The distance between these benchmarks is 370 metres. Book the readings by using Height of Collimation method and determine the reduced levels of each point. Perform the necessary checks.

[CLO 3: C3]

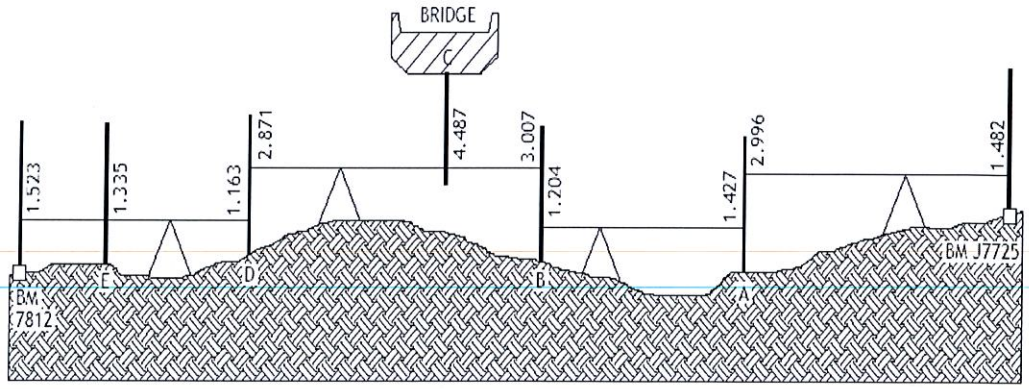

Figure 1

(16 marks)

QUESTION 2

(a) Explain briefly the following:

i. Whole circle bearing [CLO 2 : C2]
(2 marks)

ii. Temporary adjustment [CLO 2 : C2]
(2 marks)

(b) Convert the following whole circle bearings to the quadrantial bearing:

i. 217° 30' [CLO 3 : C3]
(1 marks)

ii. 338° 15' [CLO 3 : C3]
(1 marks)

(c) Convert the following quadrantial bearings to whole circle bearing:

i. S 37° 30' E [CLO 3 : C3]
(1 marks)

ii. S 27° 45' W [CLO 3 : C3]
(1 marks)

iii. N 17° 45' W [CLO 3 : C3]
(1 marks)

(d) The following bearings were observed in running a compass traverse:

LINE	FORE BEARING	BACK BEARING
1-2	66° 15'	244° 00'
2-3	129° 45'	313° 00'
3-4	218° 30'	37° 30'
4-1	306° 45'	126° 45'

Calculate the final bearing by using the Local Attraction Method. [CLO 3 : C3]
(16 marks)

QUESTION 3

(a) Explain the following terms used while manipulating a Transit Theodolite [CLO 2:C2]

(10marks)

i. Centering
ii. Transiting
iii. Face left
iv. Face right
v. Line of collimation

(b) There are **THREE (3)** temporary adjustments of a theodolite . Explain the temporary adjustment of a theodolite. [CLO 2: C2]

(6 marks)

(c) A traverse was carried out and the result is shown in Table 3 [CLO3:C3]

Calculate the area by using the Double Meridian Method. (Use DMD x Latitude)

Line	Latitude	Departure
1-2	+58.146	-52.354
2-3	-45.33	-141.527
3-4	-145.608	*+43.578*
4-5	+31.167	+95.821
5-6	+32.854	+103.476
6-1	+68.771	-48.994

Table 3

(9 marks)