

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

CIVIL ENGINEERING DEPARTMENT

FINAL EXAMINATION

CC201- ENGINEERING SURVEY 2

DATE: 22 NOVEMBER 2012 (THURSDAY) DURATION: 02.30 PM - 04.30 PM

This paper consists of **EIGHT (8)** pages including the front page. Section A: Essay (2 questions – answer all) Section B: Essay (3 questions – answer 2 questions)

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BY THE CHIEF INVIGILATOR

(The CLO stated is for reference only)

SECTION A

ESSAY QUESTION (50 marks)

INSTRUCTION:

This section consists of TWO (2) essay questions. Answer ALL the questions.

QUESTION 1

- a) Figure A(1)a below illustrated tachymetry with Tangential System. If Height of Instrument was measured as 1.520m, calculate;
 - i. Horizontal Distance (H) between point A and point B.

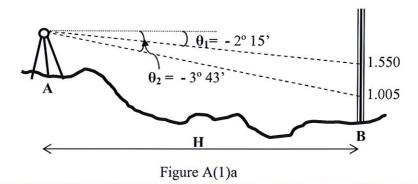
[CLO 1: C2]

(5 marks)

ii. Reduced Level of point A, if Reduced Level of point B is 80.000m.

[CLO 1: C2]

(8 marks)



b) Find Horizontal Distance of X-Y measured by Substance System if substance bar length is 4.500m as in Figure A(1)b.

[CLO 1: C2]

(12 marks)

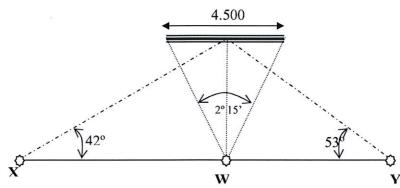


Figure A(1)b

QUESTION 2

a) Nowadays the use of Electronic Distance Measurement (EDM) has been increased. List FIVE (5) common brands of EDM in current market.

[CLO3: C1]

(5 mark)

b) Electronic Distance Measurement device can be classified according to the types of wave, such as:

- Microwave
- Infra Red Wave
- Laser

Discuss briefly TWO (2) out of THREE (3) types of the above waves.

[CLO3: C1]

(10 mark)

c) Explain briefly **TWO** (2) types of instrument error in EDM.

[CLO3: C1]

(10 mark)

SECTION B

ESSAY QUESTION (50 marks)

INSTRUCTION:

This section consists of **THREE** (3) essay questions. Answer **TWO** (2) questions only.

QUESTION 1

a) The following Figure B(1)a shows the reduced level of a rectangular plot which is to be excavated to a uniform depth of 9 meters above datum. Calculate the average depth and the volume of earth to be excavated.

[CLO2: C3]

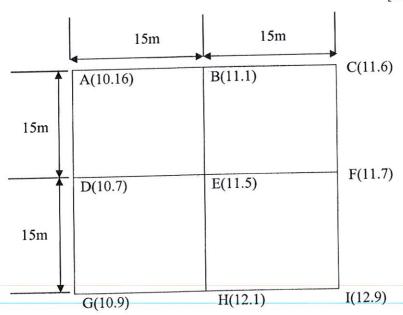
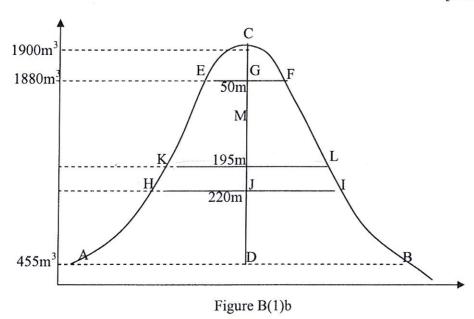


Figure B(1)a.

(14marks)

b) By referring to Figure B(1)b, identify the balance line, freehaul distance, overhaul distance, freehaul volume and overhaul volume. Calculate the haul, overhaul and freehaul.

[CLO2: C3]



(11 marks)

QUESTION 2

Two straight lines that intersect at a deflection angle 50^{0} 00' 00" are connected by a circular curve with radius 400 m. Chain age at the intersection point is 1692.020 m. Calculate the setting out at 25m interval. Given bearing at $T_{1}I$ is 60^{0} 00' 00", prepare the suitable table. Find:

[CLO2: C3]

- i. Tangent length
- ii. Length of circular arc
- iii. Chain age
- iv. Deflection angle with one (1) theodolite.

(25 marks)

QUESTION 3

a) Explain FIVE (5) responsibilities of a Setting Out Engineer.

[CLO2: C3] (5 marks)

b) The data for setting out of propose drainage in primary school project are as follow:

= 3.0 m

[CLO2: C3]

Invert level at point A

Gradient Drainage from point A to point B

Distance from point A to point B

TBM

Back sight (staf on TBM)

Intermediate sight (staf at point A)

Fore Sight (staf at drain point B)

= 28.321m

= 1: 75 (decreased)

= 50m

= 32.41m

= 1.122m

= 2.232m

= 3.100m

Calculate:

Traveller Height

- i. Height of rail at point A and point B
- ii. Depth of excavation at point A and point B

(20marks)

Sultan Idris Shan
Jabatan Pengajian Politeki..k

Name :

TACHYMETRY FORM (TANGENTIAL METHOD)

NOTE								
REDUCED LEVEL (STAFF), AL _f = AL _{s+}								
REDUCE D LEVEL (STATION), ALs								
DIFFERENCE OF HEIGHT dH= H.I ± V – H _B								
VERTICAL DISTANCE $V = \binom{1/2}{2} \text{ H tan } \phi$								
HORIZONTAL DISTANCE S (tar0-tarp)								
DIFFERENCE OF HEIGHT, S = H _A - H _B	4	8			950			
Height of A & B, (AT STAFF) H _A & H _B								
VERTICA L ANGLE, (LOWE R) Φ						5		
VERTICAL ANGLE, (UPPER)0								
HORIZONT AL BEARING								
STATION & HEIGT OF INSTRUM ENT (H.I)								

Name Matric no.

TACHYMETRY FORM (TANGENTIAL METHOD)

Sultan Idris Shah
Jabatan Pengajian Politeknik

								STATION & HEIGT OF INSTRUM ENT (H.I)
			,					HORIZONT AL BEARING
								VERTICAL ANGLE, (UPPER)0
								VERTICA L ANGLE, (LOWE R) Φ
		8						Height of A & B, (AT STAFF) H _A & H _B
								DIFFERENCE OF HEIGHT, S = H _A - H _B
								HORIZONTAL DISTANCE $H=\frac{s}{(\tan\theta-\tan\phi)}$
								VERTICAL DISTANCE $V = {\binom{1}{2}} H \tan \phi$
					÷			DIFFERENCE OF HEIGHT dH= H.I ± V - H _B
								REDUCE D LEVEL (STATION), AL _s
								REDUCED LEVEL (STAFF), AL _t = AL _{s+} dH
								NOTE

Name Matric no.

TACHYMETRY FORM (STADIA METHOD)

Sultan Idris Shah Jabatan Pengajian Politeknik

NOTE									
REDUCED LEVEL (STAFF), AL= AL _{3+dH}									
REDUCED LEVEL (STATION), AL,									
DIFFERENC E OF HEIGHT dH=H.I+V-h	1								
VERTICAL DISTANCE V= ½kSSin20+ Csin 0									
HORIZONT AL DISTANCE H = 100s							-		
INTERVAL OF STADIA (s)			5						
STADIA (MIDDLE)									
UPPER & LOWER STADIA									
VERTICAL ANGLE, 0						= 1			
HORIZONTAL BEARING						2			
STATION & HEIGT OF INSTRUME NT (H.I)				3					

Name : Matric no. :

TACHYMETRY FORM (STADIA METHOD)

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											UPPER & LOWER STADIA
	-										STADIA (MIDDLE)
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		,									VERTICAL DISTANCE V= 1/2ksSin20+ Csin 0
											DIFFERENC E OF HEIGHT dH=H.I±V-h
											REDUCED LEVEL (STATION).
-											REDUCED LEVEL (STAFF), AL= ALadH
											NOTE