

SULIT



**BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI
KEMENTERIAN PENGAJIAN TINGGI**

JABATAN KEJURUTERAAN AWAM

PEPERIKSAAN AKHIR

SESI I : 2022/2023

DCG30103: PHOTOGRAMMETRY

TARIKH : 20 DISEMBER 2022

MASA : 2.30 PM - 4.30 PM (2 JAM)

Kertas ini mengandungi **TUJUH (7)** halaman bercetak.

Bahagian A: Soalan Subjektif (2 Soalan)

Bahagian B: Soalan Subjektif (4 Soalan)

Dokumen sokongan yang disertakan : Tiada

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SULIT

SECTION A: 50 MARKS
BAHAGIAN A: 50 MARKAH

INSTRUCTION:

This section consists of **TWO (2)** subjective questions. Answer **ALL** questions.

ARAHAN:

Bahagian ini mengandungi DUA (2) soalan subjektif. Jawab SEMUA soalan.

QUESTION 1

SOALAN 1

- | | |
|------------|---|
| CLO1
C2 | <p>(a) Explain vertical aerial photo with aided suitable diagrams.
<i>Terangkan foto udara pugak dengan bantuan gambarajah yang sesuai.</i></p> <p style="text-align: right;">[5 marks]
[5 markah]</p> |
| CLO1
C3 | <p>(b) There are orthogonal and perspective projection in photogrammetry. Differentiate THREE (3) of orthogonal and perspective projection.
<i>Terdapat unjuran ortogonal dan perspektif dalam photogrammetry. Bezakan TIGA (3) unjuran ortogonal dan perspektif.</i></p> <p style="text-align: right;">[10 marks]
[10 markah]</p> |
| CLO1
C3 | <p>(c) Sketch a diagram of forward overlap, side overlap and air base.
<i>Lakar gambar rajah bagi tindih hadapan, tindih sisi dan bes udara.</i></p> <p style="text-align: right;">[10 marks]
[10 markah]</p> |

QUESTION 2**SOALAN 2**CLO1
C2

- (a) Identify
- THREE (3)**
- parameters involved in three dimensional transformations.

Kenalpasti TIGA (3) parameter yang terlibat dalam transformasi tiga dimensi.

[5 marks]

[5 markah]

CLO1
C3

- (b) Based on Table A2 (b) calculate the parameters value of a, b, TE and TN by using simultaneous equation/ basic matrix method.

Berdasarkan pada Jadual A2 (b), hitung nilai parameter bagi a, b, TE dan TN dengan menggunakan kaedah persamaan serentak/ matrik asas.

Table A2 (b): Model and Ground Coordinate system of point A, B and C.

Jadual A2(b): Sistem Koordinat Model and Bumi bagi titik A, B dan C.

Point	Model coordinates system		Ground coordinates system	
	X (mm)	Y (mm)	E (m)	N (m)
A	180.50	- 95.20	2500.80	5500.75
B	150.20	350.80	1860.50	5860.10
C	680.80	320.45	?	?

[10 marks]

[10 markah]

CLO1
C3

- (c) Based on your answer in question 2(b), calculate the ground coordinates of point C.

Berdasarkan jawapan anda di soalan 2(b), hitung koordinat bumi bagi titik C.

[10 marks]

[10 markah]

SECTION B : 50 MARKS**BAHAGIAN B : 50 MARKAH****INSTRUCTION:**

This section consists of **FOUR (4)** subjective questions. Answer **TWO (2)** questions only.

ARAHAN:

Bahagian ini mengandungi EMPAT (4) soalan subjektif. Jawab DUA (2) soalan sahaja.

QUESTION 1**SOALAN 1**

- CLO1
C2 (a) Write the definition of Photogrammetry as stated by 'The American Society of Photogrammetry'.
Tuliskan definisi fotogrametri seperti yang dinyatakan oleh 'The American Society of Photogrammetry'.
[5 marks]
[5 markah]
- CLO1
C3 (b) Describe **THREE (3)** types of aerial photographs in photogrammetry.
Jelaskan TIGA (3) jenis foto udara dalam fotogrammetri.
[10 marks]
[10 markah]
- CLO1
C3 (c) Explain monoscopy vision and stereoscopic vision in the principle of human eyes works.
Terangkan penglihatan monoskopi dan stereoskopi dalam prinsip pandangan mata manusia.
[10 marks]
[10 markah]

QUESTION 2**SOALAN 2**

- CLO1
C2 (a) Describe tilt aerial photograph with aided diagram.
Jelaskan foto udara senget dengan bantuan gambarajah.
- [5 marks]
[5 markah]
- CLO1
C3 (b) Explain the rotation of omega, phi and kappa involved in photogrammetry.
Terangkan putaran omega, phi dan kappa yang terlibat dalam fotogrametri.
- [10 marks]
[10 markah]
- CLO1
C3 (c) A vertical aerial photograph was taken from flying height of 3200m above datum with 250mm focal length camera. Highest, lowest and average terrains appearing in the photo are 2000m, 900m and 1450m respectively. Calculate the maximum, minimum and average photo scales.
Gambar udara pugak diambil daripada ketinggian terbang 3200m di atas datum dengan jarak fokus kamera 250mm. Ketinggian permukaan bumi tertinggi, terendah dan ketinggian purata di atas foto masing-masing adalah 2000m, 900m dan 1450m. Hitung skala foto maksimum, minimum dan purata.
- [10 marks]
[10 markah]

QUESTION 3**SOALAN 3**CLO1
C2

- (a) Give **FIVE (5)** important factors to be considered in flight planning.

Berikan LIMA (5) faktor penting yang perlu dipertimbangkan dalam perancangan penerbangan.

[5 marks]

[5 markah]

CLO1
C3

- (b) Explain the forward overlapped and side overlapped in flight planning.

Terangkan tindihan hadapan dan tindihan sisi dalam melakukan perancangan penerbangan.

[10 marks]

[10 markah]

CLO1
C3

- (c) The study area is 40km x 40km and the average terrain elevation is 150m. The speed of the aircraft is at 200 km/h. The forward overlap and side lap are 60% and 30% respectively and the flying height is at 2000m. The camera focal length is 152mm and the size format 230mm x 230mm is to be used.

Kawasan kajian adalah 40km x 40km dan ketinggian purata rupa bumi ialah 150m. Kelajuan pesawat adalah pada 200 km/j. Tindihan hadapan dan tindihan sisi masing-masing adalah 60% dan 30% dan ketinggian penerbangan adalah pada 2000m. Jarak fokus kamera ialah 152mm dan saiz format foto 230mm x 230mm digunakan.

Based on the information given, calculate:

Berdasarkan maklumat yang diberi, kirakan:

- i. Photo scale / skala Foto
- ii. Exposure time interval / Sela masa dedahan
- iii. Strip distance / Jarak jalur

[10 marks]

[10 markah]

QUESTION 4**SOALAN 4**

- CLO1
C2 (a) State **TWO (2)** conditions of two dimensional (2D) conformal transformation.
Nyatakan DUA (2) syarat transformasi konformal dua dimensi (2D).
- [5 marks]
[5 markah]
- CLO1
C3 (b) Given a sequence of tilt in the rotation matrix M for omega (ω), phi (ϕ) and kappa (κ) as follow;
Based on sequence matrix M , calculate the tilt angle of omega (ω), phi (ϕ) and kappa (κ) using formula below.
*Diberi turutan kesengetan dalam bentuk matriks putaran M bagi omega (ω), phi (ϕ) dan kappa (κ) seperti berikut;
Berdasarkan turutan matrik M , kirakan nilai kesengetan omega (ω), phi (ϕ) dan kappa (κ) menggunakan formula di bawah.*
- $$m_{11} = 0.998477, m_{31} = 0.017452, m_{32} = 0.034894$$
- $$M = \begin{bmatrix} \cos \phi \cos \kappa & (\sin \omega \sin \phi \cos \kappa + \cos \omega \sin \kappa) & (\sin \omega \sin \kappa - \cos \omega \sin \phi \cos \kappa) \\ -\cos \phi \sin \kappa & (\cos \omega \cos \kappa - \sin \omega \sin \phi \sin \kappa) & (\cos \omega \sin \phi \sin \kappa + \sin \omega \cos \kappa) \\ \sin \phi & -\sin \omega \cos \phi & \cos \omega \cos \phi \end{bmatrix}$$
- [10 marks]
[10 markah]
- CLO1
C3 (c) Clearly explain **THREE (3)** orientation process involved in photogrammetry.
Terangkan dengan jelas TIGA (3) proses orientasi yang terlibat dalam fotogrammetri.
- [10 marks]
[10 markah]

SOALAN TAMAT

