Internal Assesment Test –1

Sub:Geodetic Engineering — Code: 21CV32

Date:02/12/2022	Duration: 90 mins	Max Marks: 50	Sem: IV	Sections:CV (A & B)

*Answer **any five** questions. Good luck!*

		Marks	OBE CO	RBT
1	Define the terms: (i) Principal plane (ii) Swing (iii) Angle of tilt (iv) Isocenter (v) Tilted Photograph.	10	2,3	L1,L2
2	A 20m chain was found to be 10cm too long after chaining a distance of 1500m. It was found to be 18cm too long at the end of the day's work after chaining a total distance of 2900m. Assuming the chain to be correct at the start of the day's work, find the true distance measured.	10	2,3	L1,L2
3	The following bearings were observed from a Prismatic Compass. Mention the Stations affected by local attraction and determine the corrected bearings of the Traverse.	10	2,3	L1
4.	Explain in detail (i) errors and sources of errors in surveying. (ii) Temporary adjustments in Plane Table Survey.	10	2,3	L1
5.(a)	Write the differences between Prismatic Compass & Surveyor's Compass.	05	2,3	L1
(b)	The magnetic bearing of Sun at Noon is 277°05′ and the declination of the place is 7°05′W. Find the True bearing of the place of observation.	05	2,3	L1
6.	Explain the importance of maps in detail.	10	2,3	L1
7.	A line AB 2Km long lying at an elevation of 500m measures 8.65 cm on a vertical photograph whose focal length of the camera lens is 0.2m.Determine the scale of the photograph in the area whose average elevation is 800m.	10	2,3	L1,L2

Question 3 table:

Line	Fore Bearing	Back Bearing
AB	45°45′	226°10′
BC	96°55′	277°05′
CD	29°45′	209°10′
DE	324°48′	144°48′

C.I

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H.O.D.

IAT - 1

Q1) Define the terms : (i) True bearing (ii) Magnetic bearing (iii) True meridian (iv) Magnetic meridian (v) Isogonic lines

Ans:- iii) It is a line passing through a point ~~t~~ in the given plane & intersecting with north pole & south pole with the surface of the earth. 2M

ii) It is the horizontal angle made by one end of a survey line with the magnetic meridian. 2M

i) It is the horizontal angle made by one end of a survey line with the true meridian 2M

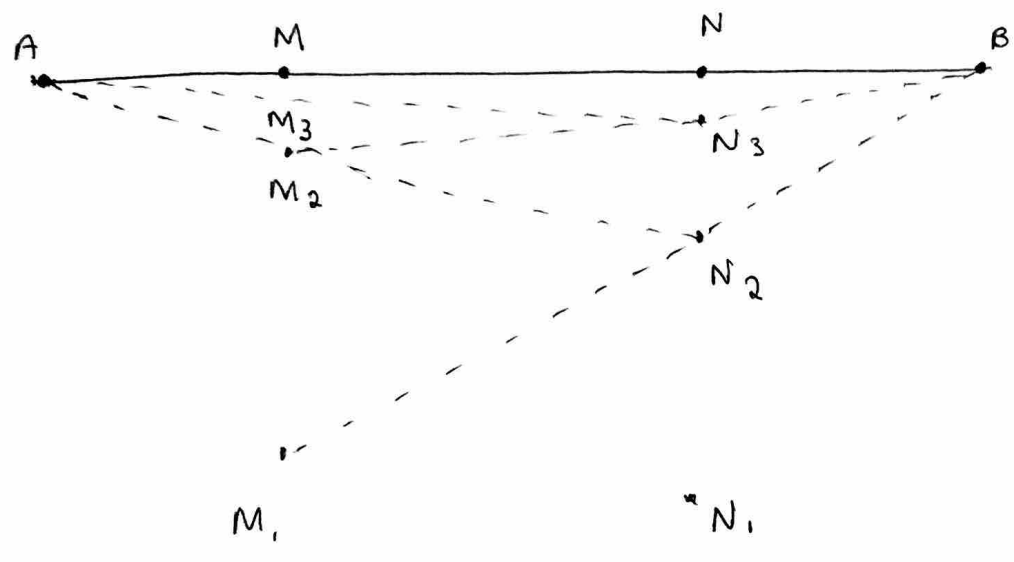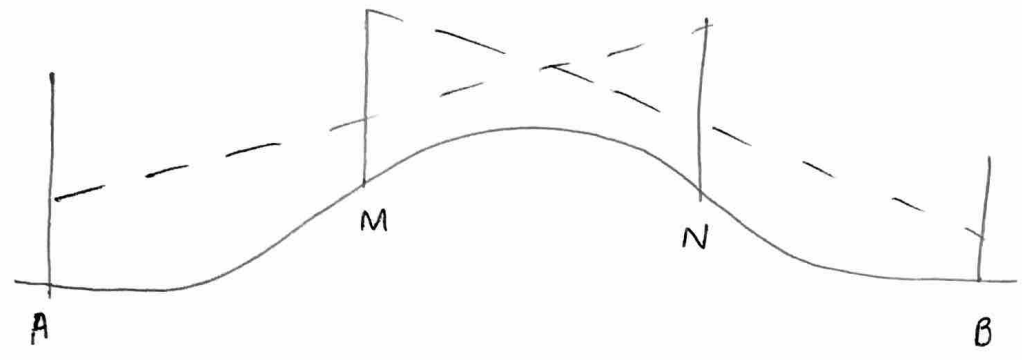

iv) It is the direction shown by a freely floating magnetic needle which is always balanced & free from magnetic forces 2M

v) A line on a map joining points on the earths surface at which the magnetic declination is the same. 2M

Q2) With a neat sketch, explain the field procedure of direct & indirect ranging.

In the fig. M & N are the two points to be fixed on AB such that both points are visible from A as well as B. It needs four people to fix points M & N one person near each point A, B, M & N

(3M)

(2M)

Q3) Explain the principles of surveying.

Ans:- 1) **Work from whole to part :**

In surveying large areas, a system of control points is identified & they are located with high precision. Then secondary control points are located using less precise methods.

Explain in detail errors & sources of errors in surveying

Errors in surveying :-

Mistakes :-

These are errors due to carelessness of the observer. They may be due to wrong reading or recording of the observations. These errors are very large & can be easily detected

(3M)

Systematic errors :-

The errors which follow a well-defined pattern are classified as systematic errors. They can be determined by mathematical expressions. They are regarded as positive, if they make result too great & as negative if they make result too small.

(3M)

Accidental errors :-

These are errors in ~~measured~~ measurement which cannot be prevented, even with sufficient care. These ~~care~~ errors may be positive or negative their magnitude may vary from reading to reading.

Human eye has a limitation of distinguishing between two close reading.

(4M)

i) For first 1500 m :

$l' = 1500$ m

$l = 20$ m

$exp^n = 10$ cm

Avg $exp^n = \dfrac{0+10}{2} = 5$ cm

$l' = 20 + \dfrac{5}{100} = 20.05$ m

$l = ?$, $l' = 1500$ m

$l = \dfrac{l'}{l} \times l^2$

$= \dfrac{20.05}{20} \times 1500$

$= 1503.75$ m ——— ①

ii) For next 1400 m

$l = 20$ m

$exp^n = 10$ cm —> 18 cm

avg $exp^n = \dfrac{10+18}{2} = 14$ cm

$l' = 20 + (14/100) = 20.14$

$l = ?$, $l' = 1400$ m

$l = \dfrac{20.14}{20} \times 1400 = 1409.8$ m ——②

Total distance = ① + ②

$= 1503.75 + 1409.8$

$= 2913.55$ m

i) α = BB of EA - FB of AB

   = $120° - 60°30'$

   $\boxed{\alpha = 59°30'}$

ii) β = BB of AB - FB of BC

   = $240°30' - 122°$

   $\boxed{\beta = 118°30'}$

iv) γ = BB of BC - FB of CD

   = $302° - 46°$

   $\boxed{\gamma = 256°}$

v) θ = BB of CD - FB of DE

   = $226° - 205°30'$

   $\boxed{\theta = 20°30'}$

vi) $\delta = \delta_1 + \delta_2$

   δ_1 = BB of DE   = $25°30'$

   δ_2 = $360°$ - FB of EA

      = $360° - 300°$

      = $60°$

   $\Rightarrow \delta$ = $25°30' + 60°$

   $\boxed{\delta = 85°30'}$

$\therefore$ $\alpha + \beta + \gamma + \theta + \delta$ = $540°$

$\Rightarrow$ $59°30' + 118°30' + 256° + 20°30' + 85°30' = 540°$

(10M)

End of scheme