

2025

GEOGRAPHY — HONOURS

Paper : DSCC-12

(Thematic Mapping and Surveying)

Full Marks : 75

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

(Use of scientific calculator is allowed)

Category - A

Answer **any ten** questions (each within **50** words).

2×10

1. Round each of the following numbers to the indicated accuracy :
(a) 56.7 (nearest unit), (b) 259.66 (nearest tenth), (c) 588 (nearest hundred), (d) 0.0568 (nearest thousandth).
2. Express each of the following numbers without using powers of 10 :
(a) 8.923×10^5 , (b) 9.52×10^{-3} , (c) 1.86×10^0 , (d) $20,000 \times 10^{-5}$.
3. What does log 3 mean? What is the antilog of 4?
4. What is the utility of log scale over natural scale?
5. What is the line of unconformity?
6. What is the use of a prism in a Prismatic compass?
7. Prove that difference between the fore and back bearing is 180° .
8. What is true dip and apparent dip?
9. Differentiate between surveying and levelling.
10. What is the difference between land use and land cover?
11. What is echo reflection?
12. Which diagrams/maps will be appropriate to represent the following socio-economic characteristics?
 - (a) age-sex composition of population
 - (b) occupational structure of population
 - (c) number of occupied residential houses
 - (d) decadal growth of population.

Please Turn Over

13. State the full forms and functions of the following national agencies :

(a) NATMO (b) NBSSLUP.

14. An observer is 28.5 metres away from a tower. The angle of elevation of the top of the tower is 45° . What is the height of the tower?

Category - B

Answer **any five** questions (each within **125** words).

15. What are true meridian and magnetic meridian? Explain with the help of an illustration.

Convert the following Forward Bearings to Backward Bearings :

3+2

(a) FB of AB = $310^\circ 30'$

(b) FB of BC = $145^\circ 15'$

(c) FB of CD = $65^\circ 45'$

(d) FB of DA = $223^\circ 30'$

16. Explain how unconformities are identified on a geological map. How are sills and dykes represented on a geological map? Use diagrams if necessary.

2+3

17. What is closing error? How is it corrected?

2+3

18. Prepare a proper field book and compute the reduced levels of each station on the basis of the given data. Carry out arithmetic check.

4+1

Station	A	B	C	D	E	F	G	H
Staff Reading in metrics	1.2	1.1	1.2	1.0	0.8	0.9	1.0	1.1

Interval 5 metres

Bench Mark at A = 20 metres.

19. What are the basic purposes of using Total Station and Echosounder?

3+2

20. Calculate the height of the object above surface by Theodolite.

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Instrument at	Object observed	Face	Vertical Angle		Remarks
A	O	L	$23^\circ 32'$	$23^\circ 34'$	Height of instrument at A = 1.45 m
		R	$23^\circ 36'$	$23^\circ 38'$	Distance between instrument and base of the object = 12.8 m

21. (a) Explain the use of Abney Level.
 (b) Mention the parts of an Abney Level.
 (c) What is the smallest accurate reading that can be measured by an Abney Level? 2+2+1

Category - C

Answer *any two* questions (each within **500** words).

22. What is socio-economic data? Discuss with suitable eggs and diagrams, the different methods of representing socio-economic data. 3+12
23. The following consecutive readings were taken with a dumpy level at 30 m interval along a line XY : 3.865, 3.762, 3.453, 2.987, 1.789, 0.854, 3.790, 3.561, 3.112, 2.569, 1.762, 1.111, 1.023, 0.986 and 0.855. The level was shifted after 5th and 11th readings. RL of the first station is 32 m.
 (a) Enter the readings on a neatly drawn field book
 (b) Calculate the RLs of all stations and check
 (c) Calculate the gradient of the line XY. 5+7+3
24. A and B are two instrument stations 15 mts apart in a theodolite survey. P is the object sighted. With the theodolite stationed at A with face left, the VC and VD readings recorded are $11^{\circ}20'$ and with face right the VC and VD readings recorded are $11^{\circ}24'$. The VC and VD readings with face left of the theodolite stationed at B are $17^{\circ}42'$ and with face right of the theodolite, the VC and VD readings recorded are $17^{\circ}40'$. The height of the instrument at station A and B are 1.30 m and 1.50 m respectively. If the RL of station A is 50 m calculate :
 (a) height of P above level of collineation
 (b) height of P above MSL
 (c) horizontal distance between A and P
 (d) slanting distance between A and P. 7+2+3+3
25. The following are the bearing of lines of a closed traverse which is done in clockwise direction :

Line	Fore bearing	Back bearing
AB	$40^{\circ}00'$	$219^{\circ}00'$
BC	$95^{\circ}30'$	$276^{\circ}30'$
CD	$208^{\circ}30'$	$25^{\circ}30'$
DA	$282^{\circ}30'$	$104^{\circ}30'$

- (a) Correct the bearing for local attraction.
 (b) Calculate the included angles of the traverse.
 (c) Carry on checking to verify if sum of interior angles is correct. 6+6+3