

April 2018

Time – Three hours
(Maximum Marks: 75)

- [N.B: (1) Q.No. 8 in PART – A and Q.No. 16 in PART – B are compulsory.
Answer any FOUR questions from the remaining in each PART – A and PART – B
(2) Answer division (a) or division (b) of each question in PART – C.
(3) Each question carries 2 marks in PART – A, 3 marks in Part – B and 10 marks in PART – C.]

PART – A

1. Define the term latitude and departure.
2. What is meant by staff intercept?
3. What is meant by double plane method?
4. What are the purpose of sounding?
5. How a curve is designated?
6. List out the components of GIS.
7. Define remote sensing and state any two applications.
8. Calculate the length and bearing of line AB, if the algebraic sum of latitude is +252.094m and algebraic sum of departure is –64.667m.

PART – B

9. What do you mean by changing face? Explain the errors eliminated by changing face.
10. Explain the fundamental principle of stadia tacheometry.
11. Define tangential tacheometry and state the advantage and disadvantage of tangential tacheometry.
12. Derive the formula to determine the elevation of the top of the object when the base is accessible.
13. What are the uses of hydrographic survey?
14. Define vertical curve and explain the types of vertical curves.
15. State the applications of total station.

16. Calculate the tangent length and the length of curve of a simple circular curve of radius 300m connecting the two straights intersects at an angle of 120° and the radius of the curve is 286.5m.

PART - C

17. (a) The following table gives the latitude and departure of the sides of a closed traverse ABCD. Calculate the independent co-ordinates and find the area of the traverse.

Line	Latitude in 'm'	Departure in 'm'
AB	+214.80	+124.00
BC	-245.10	+205.70
CD	-155.90	-90.00
DA	+186.20	-239.70

(Or)

- (b) The following are the lengths and bearings of a closed traverse ABCDE. Calculate the length and bearing of EA.

Line	Length (m)	W.C.B.
AB	458.00	198° 59'
BC	262.50	282° 14'
CD	160.00	320° 13'
DE	398.50	35° 13'
EA	?	?

18. (a) The following readings were taken by a tacheometer from a station. A staff was kept vertical. The constants are 100 and 0. Find out the horizontal distance from A to B and the reduced level of B.

Instrument station	Staff station	Vertical angle	Stadia readings	Remarks
A	BM	-6° 00'	1.100, 1.580, 2.060	RL of BM is 975.000m
	B	+8° 00'	0.980, 1.230, 1.480	

(Or)

- (b) A tachometer fitted with an anallatic lens was used to observe the following:

Instrument station	Staff station	Bearing	Vertical angle	Stadia reading
O	A	320°	+12°	0.905, 1.730, 2.555
	B	50°	+10°	0.745, 2.220, 3.650

The value of the constant is 100 and the staff was held vertical. Determine the length and gradient AB.

19. (a) Determine the RL of top of a transmission tower from the following observations.

Instrument station	Vertical angle	Staff reading on EM	RL of BM.
A	18° 30'	2.815m	110.000m
B	12° 40'	1.865m	

The distance between the station A and B is 60m. The station A, B and the tower are in the same vertical plane.

(Or)

- (b) (i) What are the applications of aerial photographs?
(ii) Briefly describe the steps in hydrographic surveying.

20. (a) (i) Explain the types of curve with neat sketches.
(ii) Write down the field procedure for setting out a curve by taking offset from long chord.

(Or)

- (b) Two straights intersect at chainage (80+17) chains. The angle of intersection is 41°. Calculate all the data necessary for setting out 3° right handed curve by Rankine's method of deflection angle. The peg interval may be taken as 30m. Give the table of deflection angle.

21. (a) (i) Briefly explain the field procedure of measuring horizontal angle using total station.
(ii) List out the accessories used in total station.

(Or)

- (b) (i) Briefly explain the application of GIS in natural resources and agriculture.
(ii) Explain the various steps in GIS mapping.
