- ✓ Answer ANY FIVE full Questions.
- ✓ Missing data if any may be assumed suitably and indicated.
- ✓ Draw neat sketches wherever necessary.

Reg. No.

1A. What are the principles of surveying? Explain.

1B. Explain how surveying is classified based on

- (i) Nature of field survey.
- (ii) Instrument used.
- (iii) Purpose of survey.

2A. Define the following terms used in levelling.

- (i) Benchmark.
- (ii) Elevation.
- (iii) Backsight.
- (iv) Foresight.

2B. Write a note on methods of booking levels.

2C. In levelling between two points A & B on opposite banks of a river, the level was set up near A, and the staff readings on A & B were 1.285 and 2.860m respectively. The level was then moved and set up near B and the respective readings on A & B were 0.860 & 2.220m. Find the true difference of level between A & B.

(4+6+10=20marks)

(08+12=20 marks)

3A. List and explain the temporary adjustments of a transit theodolite.

3B. Observations were made to a signal Q from two instrument stations A & B in the same vertical plane as Q. Stations A & B are 80m apart. Vertical angles to Q from A & B were $30^{\circ}45'$ & $16^{\circ}10'$ respectively. Staff readings on a benchmark from A & B were 2.850m & 3.580m respectively. Determine the elevation of top & bottom of the signal if the height of the signal from its base was 8m. Take, RL of the Bench mark =100.000m

(8+12=20marks)

4A. With usual notations, explain the tangential method of tacheometry when both angles are angles of elevation.

4B. Compute the gradient of line AB when tacheometric observations were made from a third point C. Constants of the instruments were 100 and 0.

Staff station	Staff intercept	Axial hair	Bearings	Vertical angle
		readings		
A	2.226m	2.013m	128°37'	-5 °30'
В	2.040	1.920m	38°37'	-6°20'

(10+10=20marks)

5A. Explain the method of obtaining the elevation of top of an object when base is inaccessible by double plane method.

5B. The following readings were observed successively with a levelling instrument. The instrument was shifted after 5^{th} and 11^{th} readings.

0.585, 1.010, 1.735, 3.295, 3.775, 0.350, 1.300, 1.795, 2.575, 3.375, 3.895, 1.735, 0.635 and 1.605m

Determine the R.L of various points if, the R.L of the point on which the first reading was taken is 136.440. Use the rise and fall method.

(10+10=20marks)

6A. Explain how the capacity of reservoir is calculated using a contour plan.

6B. With the help of neat diagrams, explain any six charecteristics of contour.

6C. With the help of neat diagrams explain the method of traversing by

- (i) Direct observation angles.
- (ii) By deflection angles.

(6+6+8=20marks)

7A. What are the different methods of designating a curve? Derive a relationship between radius and degree of curve.

7B. Explain the method of setting out a compound curve in the field using a theodolite and accessories.

7C. Two parallel straights 9m apart are to be connected by a reverse curve. If the distance between the two tangent point is 72m, find the common radius of the two branches. If the radius of first is 100m, find the radius of the second branch.

(6+6+8=20marks)

8A. What do you mean by an ideal transition curve? Derive the intrinsic equation for the same.

8B. Explain any 5 types of vertical curve with the help of neat figure.

(10+10=20marks)

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