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Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Explain various methods for determining the width of a river.   [8]

   (b) The area of the plan of an old survey plotted to a scale of 10m to 1cm measures now as 100.2 Sq.cm as found by planimeter. The plan is found to have shrunk so that a line originally 10cm long now measures 9.6cm only. There was also a note on the plan that the 20m chain used was 8cm too short. Find the true area of the survey.   [8]

2. Write short notes on the following.

   (a) Closed and open traverse

   (b) Magnetic meridian and true meridian.

   (c) Fore and back bearings of a line.

   (d) Magnetic declination and Dip.   [4×4]

3. (a) What is meant by orientation. Explain the two methods of orienting the plane table.   [8]

   (b) List the advantages and disadvantages of plane table surveying.   [8]

4. (a) Explain in detail how in a dumpy level you will make the axis of the bubble tube perpendicular to the vertical axis.   [8]

   (b) Find the error of reading of levelling staff if the observed reading is 12.00' and the point sighted the staff is 6" off the vertical through the bottom.   [8]

5. (a) What is indirect method of locating contours? Explain step by step procedure of locating contours by method of squares.   [8]

   (b) What do you mean by interpolation of contours? Explain arithmetical method of interpolation of contours.   [8]

6. (a) State and explain Simpson's rule. Derive an expression for it.   [8]

   (b) A series of perpendicular offsets were taken from a survey line to a curved boundary. Determine the area using both Tragezoidal and Simpson's Rules for the data given below 15m.   [8]

Distance(m)	0	15	30	45	60	75	90	105	120
Offset (m)	3.25	505	4.2	6.65	8.70	6.30	3.20	4.50	5.65

7. (a) A railway embankment is 10m wide with side slopes $1\frac{1}{2}$ to 1. Assuming the ground to be level in a direction transverse to the centre line, calculate the volume contained in a length of 120m, the centre heights at 20m intervals being in metres 2.2, 3.7, 3.8, 4.0, 3.8, 2.8 and 2.5.   [8]

   (b) A road embank is 8m wide and 200m in length at the formation level with a side slope of 1.5:1. The embankment has a rising gradient of 1 in 100m. The ground levels at every 50m along the centre line are as follows.

Distance (m)	0	50	100	150	200
R.L.(m)	164.5	165.2	166.8	167	167.2

   The formation level of zero chainage is 166m. Calculate the volume of earth work.   [8]

8. (a) Explain with a neat diagram, the working of the Line Ranger.   [8]

   (b) Describe Amsler polar planimeter with a neat sketch. Also explain how it is used to measure the area of plan of any shape accurately.   [8]

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