Q.P. Code : 539002

(3 Hours)   [Total Marks : 80

N.B.: (1) Question **No.1** is **compulsory**.
     (2) Solve **any Three** questions out of the remaining questions.
     (3) **Figures** to the **right** indicate **full marks**.
     (4) Assume suitable **data** wherever **necessary** and **state the same**.

1. Write short notes on (**Any Four**) :   **20**
    (a) Block contouring project in survey camp
    (b) Methods of tacheometry
    (c) Route surveying
    (d) Remote sensing
    (e) Designations of curves
    (f) Electronic Digital Theodolite

2. (a) Describe the radial contouring project in detail?   **10**
    (b) In tacheometry, the following observations were observed with a tacheometer,   **10** fitted with anallatic lens and multiplying constant as 100. If the RL of BM is 555.700m, calculate the RLs of A, B and C?

Inst. sth	ht (m)	staff stn	vertical single	staff readings (m)	remark
A	1.40	BM	-1°35'	3.540, 2.330, 1.120	LOS
A	1.40	B	+2°54'	3.550, 2.380, 1.210	Inclined, staff vertical
B	1.38	C	+3°12'	3.985, 2.425, 0.865	

3. (a) The stadia readings with a horizontal sight on a vertical staff held 50m away   **10** from a tacheometer are 1.284 and 1.780m. The total length of object glass is 250mm. The distance between object glass and trunnion axis is 150mm, calculate stadia interval?
    (b) Explain the steps involved in determining 'L' section and 'C' section of a   **10** road? State the practical utilities of these for a civil engineer?

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4. (a) Explain the followings with neat sketches :   **12**
   (i) Compound curve
   (ii) Composite curve
   (iii) Reverse curve
   (iv) Vertical curve

   (b) What are the essential requirements of a transition curve? Derive an   **8**
   expression for an ideal transition curve?

5. (a) Two tangents intersect at chainage (79+10) and the deflection angle is 50°30'.   **12**
   Compute the necessary data for setting out of simple circular right hand
   curve of 300 m radius by Rankine's method. Take P.I. = 30m. Prepare
   setting out table and show necessary checks.

   (b) Discuss the methods of setting out simple circular curve with sketches.   **8**

6. Explain the following (**Any Four**) :   **20**
   (a) GPS
   (b) EDM
   (c) Use of computers in surveying
   (d) Total station
   (e) Project survey for a dam
   (f) Setting out of culvert

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