SE-sem-IV- old -civil
SUR-II

10/12/15

QP Code : 1436

(OLD COURSE)

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No **1** is **compulsory**.
(2) Attempt any **four** out of the remaining **six** questions.
(3) **Figure** to the **right** indicates **full** marks.
(4) Draw **neat** sketches wherever **necessary**.

1. Write short notes on any **four** of the following: **20**
   (a) Difference between Fixed hair method and moveable hair method.
   (b) Electronic digital theodolite
   (c) GIS andGPS
   (d) Setting out of culvert
   (e) Principle of tacheometry

2. (a) Two tangents meet at a chainage of 2045m, the deflection angle being 32°. A circular curve of radius 250m is to be introduced in between them. Calculate the **10**
   (i) Tangent length
   (ii) Length of circular curve
   (iii) Chainage of the tangent points
   (iv) Deflection angle for setting out the first three peg and the last peg on the curve by Rankine's Method. (Peg Interval 20 m).
   (b) Calculate the reduced levels of the various station pegs on a vertical curve which is to be said to connect two uniform grades 0.65% and -0.7%. The chainage and the required level of the point of intersections are 2525m and 335.65m respectively. Assume the rate of change of grade to be 0.05 per 20m chain. **10**

3. (a) A compound curve consisting of two simple circular curves of radii 350m and 500m is to be laid down between two. straights. The angle of intersection between the tangents and the two straights are 25^0 and 55°. Calculate the various elements of the compound curve. **10**
   (b) Explain Setting out a foundation plan for a load bearing structure. **10**

4. (a) Explain Radial Contouring. **10**
   (b) What is ideal transition curve? Explain the methods used for determining the length of transition curve? **10**

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5. (a) Derive an expression for horizontal distance by a tacheometer when the staff is held vertical and line of sight inclined. Explain how RL of staff station is calculated. **10**

(b) Explain the following : **10**

(i) Uses of total station

(ii) Auto level

6. (a) A tacheometer is set up an intermediate point on a traverse course PQ and the following observations were made with a vertical held staff. **10**

Staff station	Vertical angle	Staff intercept (m)	Axial hair reading (m)
P	+9°30'	2.250	2.105
Q	+ 6°00'	2.055	1.875

The instrument was fitted with an anallatic lens. The multiplying constant is 100. Compute the length PQ and the RL of Q if the RL of P is 350.50 m.

(b) What is precise levelling? Which instruments are required for it? Explain how it is conducted in field. **10**

7. (a) Enlist various functions of EDM and explain principles underlying them. **10**

(b) Explain how surface alignments and levels from surface one transferred to underground in tunnel surveys. **10**