(25)

SE-sem-IV – CBGS – Civil

SYR-II

30/11/15

QP Code : 5344

(3 Hours) **[Total Marks : 80**

N. B. : (1) Question No. **1** is **compulsory.**
(2) Attempt any **three** question out of remaining questions.
(3) Illustrate answers with neat sketches wherever required.
(4) Attempt sub-question in order.
(5) Assume any suitable data if required and state the same clearly.
(6) **Figures** to **right** indicate **full** marks.

1. Write short notes on any **five** :– 20
   (a) Tacheometric contouring
   (b) Remote sensing and its applications
   (c) Elements of simple circular curve
   (d) Distance and gradient measurement with subtense bar
   (e) Grade stake & boning rod
   (f) Type of horizontal & vertical curves
   (g) Beaman's stadia arc

2. (a) A tacheometer was set up at an intermediate point on traverse PQ & the following observations were made on vertically held staff 8

Staff station	Vertical angle	Staff intercept	Axial hair reading
P	+9°30'	2.250	2.105
Q	+6°0'	2.055	1.875

The instrument was fitted with an anallactic lense. Compute length PQ & RL of Q; if RL of P is 350.50 m.

(b) Derive an expression for distance & elevation formula for inclined line of sight & staff held vertical. 7

(c) Determine tacheometric contants from the following data 5

Distance (m)	Lower stadia Reading (m)	Upper stadia reading (m)
202	2	4
302	1.5	5

Also find distance when stadia wire readings are 1.5 m & 5.5 m.

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3. (a) Explain in detail how route surveying for canal is carried out 10
   (b) Explain setting out of culvert 6
   (c) State necessity of reverse curve & transition curve 4

4. (a) Explain setting out of curve by offsets from chords produced. 8
   (b) Two straights AB & BC intersect at a chainage of 4242 m. The intersection angle being 140°. It is required to set out a 5° simple circular curve to connect the straights. Calculate the data necessary to set out the curve by method of offset from chord produced at an interval of 30 m. 8
   (c) Write short note on Sight distance & stopping sight distance. 4

5. (a) A road 8 m wide is to deflect through an angle of 60° with radius of 300 m. The chainage of intersection point being 3605 m. A transition curve is to be used at each end of the circular curve of such a length to gain a radial acceleration of 0.5 m/s^3 when the speed is 50 kmph. Find:–
      (1) Length of transition curve 1
      (2) Super elevation 1
      (3) Chainage of all the junction points 6
      (4) Offset at x=L/4; L/2, 3L/4 & L 2
   (b) A 3% rising gradient meets a 2% down gradient. A vertical curve of 200 m long is to be used. The peg interval being 20 m. Calculate the curve points by tangent correction method and calculate the required staff readings. RL of apex is 350 m & its chainage is 1000 m. 10

6. (a) Write short notes on :–
      (i) GPS & its applications 4
      (ii) Principle of EDM 4
      (iii) Elements of compound curve 4
   (b) List various modern instruments with their specific use. Describe in detail working of total station. 8
