Total No. of Questions—**8**] [Total No. of Printed Pages—**4**

Seat No.	

[5152]-104

S.E. (Civil) (I Sem.) EXAMINATION, 2017

SURVEYING

(2012 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. **:—** (*i*) Answer Q. No. **1** *or* Q. No. **2**, Q. No. **3** *or* Q. No. **4**, Q. No. **5** *or* Q. No. **6**, Q. No. **7** *or* Q. No. **8**.

(*ii*) Neat diagrams must be drawn wherever necessary.

(*iii*) Figures to the right indicate full marks.

(*iv*) Assume suitable data, if necessary.

(*v*) Use of electronic pocket calculator is allowed in the examination.

(*vi*) Use of cell phone is prohibited in the examination hall.

1. (*a*) Which are the likely error in plane table surveying ? Explain how to eliminate them. [6]

(*b*) The following readings were observed during a reciprocal leveling with one level : [6]

Instrument at	Staff Readings on		Remark
	P	**Q**	
P	1.425	2.724	Distance between
Q	1.429	2.504	A & B is 1150 m

P.T.O.

Find :

(*i*) the true R.L. of B, if R.L. of A = 500.187 m

(*ii*) the combined correction due to curvature and refraction

(*iii*) the error in the collimation adjustment of the instrument

Or

2. (*a*) Find the included angles of the closed traverse PQRSP and correct them for local attraction, if any. [6]

Line	**PQ**	**QR**	**RS**	**SP**
F.B.	36°10'	109°20'	159°30'	270°20'
B.B.	216°10'	288°40'	341°10'	89°20'

(*b*) The eye of an observer is 10 m above the ground. He was able to see the top of a light-house 60 m high just at the level of the horizon. Determine the distance of observer from light-house. [6]

3. (*a*) Define the following terms : [6]

Swinging, Bubble up, Transiting, Vertical axis

(*b*) Two tangents intersect at chainage of 1192 m with deflection angle of 50°30'. Calculate the necessary data for setting out a curve with radius of 300 m by offset from chord produced method. Take peg interval as 30 m. [6]

Or

4. (*a*) ABCDA is a closed traverse. Determine the missing data in the following table. [6]

Line	**AB**	**BC**	**CD**	**DA**
Length (m)	230.5	250.2	210.5	—
Bearing	N36°45'E	S82°48'E	S10°15'E	—

(*b*) What are transition curves ? Explain its requirement. [6]

5. (*a*) Enlist and explain the temporary adjustments of a theodolite. [5]

(*b*) A tacheometer with constants K = 100, C = 0.3 was used to observe the following readings : [8]

Instrument at	**Staff at**	**Vertical angle**	**Staff Readings**
	P	+3°15'	1.355, 2.580, 3.935
A	Q	–1°15'	0.985, 1.660, 2.335

Determine the RL of Q. Take R.L. of P = 100.000 m. Also determine distance PQ if horizontal angle PAQ = 68°30'.

Or

6. (*a*) Explain the basic principle of tacheometry with sketch. [4]

(*b*) Derive the distance and elevation formulae for an inclined line of sight with angle of depression and staff is vertical. [4]

(*c*) Readings on a vertical staff are taken from a station O which is 30 m from A and 60 m from B. The stadia readings on staff at A are 1.135, 1.284, 1.433 and that on staff at B are 1.025, 1.325, 1.624. Determine the instrument constants. [5]

7. (*a*) Enlist the major functions that can be performed by Electronic Total Station (ETS). [6]

(*b*) Write a short note on Tunnel survey with respect to transferring the alignment through shafts, with sketch. [7]

Or

8. (*a*) Explain the points to be kept in mind when road project is to be carried out with respect to necessity and marking the tentative alignment of road. [6]

(*b*) What is ETS ? Explain the basic features of a total station. [7]