

Seat No.	
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**S.E.(Civil) (Semester -III) Examination, November - 2019**

**SURVEYING-I**

**Sub. Code : 63339**

**Day and Date : Tuesday, 26-11-2019**

**Total Marks :100**

**Time : 10.00 a.m.to 1.00 p.m.**

- Instructions :**
- 1) Answer any **THREE** questions from **EACH** section.
  - 2) Figures to the **RIGHT** indicate **FULL** marks.
  - 3) Assume suitable data if **NECESSARY** and state them clearly.
  - 4) Answers shall be supported by adequate sketches.

**SECTION-I**

- Q1) a)** What is meant by combined correction in levelling? Derive its equation[5]
- b) Differentiate between radiation and intersection. [5]
- c) Show that the reciprocal leveling eliminates the effect of atmospheric refraction and earth's curvature as well as any error in the line of collimation of the instrument. [8]
- Q2) a)** What are different methods of contouring? Describe any method along with sketch. [6]
- b) The following observations were made during the testing of a dumpy level. [10]

Instrument at	Staff reading at	
	A	B
A	1.725	2.245
B	2.145	3.045

**P.T.O.**

- i) Is the instrument in adjustment.
- ii) What should be the staff reading A during the second set up to the instrument for the line of collimation to be exactly horizontal?
- iii) What should be R.L. of B if R.L. of A is 450.00m?
- Q3) a)** What is a zero circle? what is need of finding the area of zero circle?[6]
- b)** Calculate the area of the zero circle with the following data (assume M=100) [10]

IR	FR	Position of anchor point	Remark
7.775	4.825	outside the figure	The zero crosses the index mark once clockwise
2.325	8.755	inside the figure	The zero crosses the index mark twice anticlockwise

- Q4) Write in Brief** [16]
- a) Auto level
- b) Principle of equating backsight and foresight
- c) Use of telescopic alidade in plane table survey
- d) Write note on sensitivity of a bubble tube.

### SECTION-II

- Q5) a)** Draw a neat sketch showing suitable portion of main scale and complete vernier scale representing an angle of  $122^{\circ} 33' 4''$ . Also indicate the step by step procedure to set this angle on vernier 'A'. [4+4]

- b) Explain spire test for adjusting a Transit theodolite. [5]
- c) Justify the statement -Even though the least count of a theodolite is 20 seconds, angles can be measured to an accuracy of 7 to 8 seconds. [4]

**Q6) a)** Following observations were taken from stations P and Q. Calculate the length and bearing of the line AB. [9]

Line	PA	PQ	QB
Length in m.	125	200	150.50
Reduced Bearing	S 60°30' W	N 30°30' E	N 50°15' W

- b) Explain different methods of distributing closing error in a closed theodolite traverse. Also, indicate the situations where they are preferred. [8]

**Q7) a)** Name different methods of locating soundings and explain in brief any Two of them. [7]

- b) Describe the construction and uses of Box sextant. [5]
- c) Explain with a neat sketch the method of transferring the alignment inside a tunnel. [5]

**Q8) a)** An angle measuring instrument was set up at a point 175 m away from a tower. The angle of elevation to the top of the tower was 25° 30' whereas the angle of depression to the bottom was 3° 45'. Calculate the reduced levels of top and bottom of tower if the reduced level of instrument axis was 1750.00 m. [5]

- b) Explain the procedure for carrying out preliminary survey for a proposed irrigation canal. [6]
- c) What are the advantages of plotting the traverse by total co-ordinates? How do you select the total co-ordinates of first station? [5]

