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10CV/CT44

Fourth Semester B.E. Degree Examination, June/July 2016
Surveying – II

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. Differentiate between the following terms:
 - (i) Transiting and swinging of telescope.
 - (ii) The upper plate and the lower plate.
 - (iii) Face left and face right observations. (06 Marks)
- b. List the miscellaneous operations that can be performed with a transit theodolite and explain the method of measuring the magnetic bearing of a line. (08 Marks)
- c. Explain the procedure for measured of horizontal angles by the method of reiteration. (06 Marks)
- 2 a. Mention the permanent adjustments of theodolite and explain the spire test used in the permanent adjustment of a theodolite. (10 Marks)
- b. The following observations when taken during the testing of a dumpy level:

Instrument at	Staff reading on	
	A	B
A	1.615	2.325
B	2.200	3.175

- (i) Is the instrument in adjustment?
 - (ii) To what reading should the line of collimation be adjusted, when the instrument at B.
 - (iii) If the RL of A is 238.00 m, what should be the RL of B? (10 Marks)
- 3 a. Derive the expression for horizontal distances, height and RL of an elevated object by double plane method, when the base is inaccessible. (08 Marks)
 - b. Mention the advantages of total station over the conventional instruments. (02 Marks)
 - c. Find the elevation of top of the tower from the following data:

Instrument station	Rdg on Big	Angle of elevation	Remarks
A	0.862	18°36'	RL of BM = 421.38
B	1.222	10°12'	Distances AB = 50 m

Stations A, B and tower are in the same vertical plane. (10 Marks)

- 4 a. Derive the standard tacheometric expression for the horizontal distance with usual notations. (06 Marks)
- b. Write short notes on the following:
 - (i) Anallactic lens. (ii) Beaman's stadia arc. (iii) Tacheometric constants. (06 Marks)
- c. A tacheometer fitted with a anallactic lens was set up at station D with the following observations. $K = 100$

Station Sighted	Bearing	Staff rdg	Verticle Angle
A	330° 20'	1.255, 1.860, 2.465	+12°12'
B	20° 36'	1.30, 1.885, 2.47	+10°36'

Calculate the RL of A and B and also the gradient from A to B. RL of instrument axis = 150 m. (08 Marks)



- 5 a. What are the different methods of setting out a simple curve? Explain the procedure for setting out a simple curve by offsets from chords produced. (10 Marks)
- b. Two straight lines having a total deflection angle of 76° are to be connected by a compound curve. The radius of first arc is 500 m and that of second arc is 800 m. If the chainage of point of intersection is 7540 m find the chainage of tangent points and point of compound curvature. Deflection angle for the first arc is 35° . (10 Marks)
- 6 a. Define satellite station and reduction to centre. (04 Marks)
- b. Explain the different tape corrections applied for base length calculations. (08 Marks)
- c. From a satellite station S, 6.8 m from the main triangulation station A the following directions were observed:
A = $0^\circ 0'$, B = $132^\circ 18' 30''$, C = $232^\circ 24' 6''$, D = $290^\circ 6' 11''$
The length of AB, AC and AD were 3265.5 m, 4022.2 m and 3086.4 m respectively. Determine the direction of AB, AC and AD. (08 Marks)
- 7 a. Define : (i) Transition curves (ii) Super elevation (iii) Bernoullis Laminiscate curve (06 Marks)
- b. With neat sketches, explain the types of vertical curves. (06 Marks)
- c. A road bend which deflects 76° is to be designed for a maximum speed of 80 km per hour. If the maximum centrifugal ratio is $\frac{1}{4}$ and maximum rate of change of radial acceleration is 0.3 m/sec^3 . Calculate
(i) Radius of the circular arc.
(ii) Length of transition curve.
(iii) Total length of transition curve. (08 Marks)
- 8 a. Describe the principle of working of a planimeter. (06 Marks)
- b. The following readings were obtained when an area was measured by a planimeter, the tracing arm being set to the natural scale. The initial and final readings were 3.46 and 5.25. The zero of the disc passed the index mark once in the clockwise direction the anchor point was inside the figure with the value of constant C of the instrument is 26.430. Calculate the area of the figure. Take $M = 100 \text{ sq.cm}$. (06 Marks)
- c. A railway embankment is 10 m wide with side slope $1\frac{1}{2} : 1$. Assuming the ground to be level in a direction transverse to the center line, calculate the volume of earthwork in a length of 140 m. The formation level at zero chainage is 409.50 m and the ground has a rising gradient of 1 in 100. (08 Marks)

Distance m	0	50	100	150	200	250	300	350
R.L. m	407.50	408.50	409.10	410.90	411.50	410.60	409.50	409.00
