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10CV44

Fourth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Surveying – II

Time: 3 hrs.

Max. Marks:100

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

PART – A

1 a. Differentiate between :
   i) Line of collimation and trunnion Axis
   ii) Horizontal axis and vertical axis
   iii) Temporary and Permanent adjustment. **(09 Marks)**
   b. Explain the measurement of a horizontal Angle by repetition method. **(06 Marks)**
   c. Explain the method of measurement of a vertical angle using a theodolite. **(05 Marks)**

2 a. Explain the object, necessity, test and adjustment of making the axis of the bubble tube perpendicular to the vertical axis of a dumpy level. **(08 Marks)**
   b. Name the fundamental axis of theodolite. **(04 Marks)**
   c. In a two Peg test on a dumpy level the following readings were taken :

Level at	Reading on		Remarks
	A	B	
O	1.682	1.320	'O' is exactly midway between A and B
A	1.528	1.178	distance between A and B = 100m

   Is with the instrument of 'A' what should be the staff reading on 'B' in order to place the line of collimation truly horizontal. **(08 Marks)**

3 a. Derive the expression for the horizontal distance, vertical height and the elevation of object, whose base is accessible by single plane method. **(10 Marks)**
   b. Determine the reduced level of a church spire 'C' from the following observations taken from two station A and B, 75 mtrs apart.
   $|BAC = 62° 18'$, $|ABC = 72° 42'$
   Angle of elevation from A to top of spire = 20° 12'
   Angle of elevation form B to top spire = 21° 6'
   Staff reading from A on BM of RL 400.00mtr = 2.240
   Staff reading from B to same BM = 3.260m **(10 Marks)**

4 a. Write explanatory notes on use of anallatic lens and subtense bar in tachometry. **(08 Marks)**
   b. A tachometer fitted with an anallatic lens was set up a station 'D' with the following :

Station sited	Bearing	Staff Readings			Vertical angle
A	340° 30'	0.800	1.855	2.910	+ 6° 30'
B	70° 30'	0.660	2.200	3.740	–4° 20'

   Determine the distance AB and gradient from point A to point B. **(12 Marks)**

PART – B

5 a. Derive a relationship between radius and degree of a curve for arc. **(04 Marks)**
   b. Derive the expression for perpendicular offset from tangent in linear method. **(06 Marks)**
   c. Explain the method of setting out a simple circular curve by Rankin's method. **(10 Marks)**

6 a. A compound curve consisting of two arcs of radii 350m and 550mtr connects two straights AB and BC, which are intersected by a line PQ. The angles APQ and BQP are 139° 30' and 36°24' respectively. Determine the Chainages of the tangent points if the chainage of the intersection point B is 5425.191mtr. **(12 Marks)**

b. The first branch of a reverse curve has a radius of 200mtr. Find the radius of second branch so that the curve can connect parallel straights 18m apart. The distance between tangent points is to be 110m. Also calculate the length of two branches of the curve. **(08 Marks)**

7 a. What is transition curve and why it is used? Also explain with suitable sketch of shift.

(08 Marks)

b. A parabolic vertical curve is to be set out between an upgradient of 0.8% and a down gradient of 0.4%. The chainage and RL of intersection point are 124.30m and 268.60m respectively. The rate of change of grade is 0.1%, per chain length of 30mtr. Calculate the chinage and RL of beginning, end and vertex point of the vertical curve. **(12 Marks)**

8 a. Explain the method of using planimeter in area calculations. **(06 Marks)**

b. What is 'zero circle of a planimeter? **(02 Marks)**

c. A road embankment is 8.0m wide and 200mtr length at the formation level with a side slope of 1.5:1. The embankment has a rising gradient of 1 in 100 mtr. The ground levels at every 50m along the centre line are as follows :

Distance (m)	0	50	100	150	200
RL (mtr)	164.5	165.2	166.8	167	167.2

The formation level of zero Chainage is 166mtr, calculate the volume of earth work.

(12 Marks)

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