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06CV44

Fourth Semester B.E. Degree Examination, June/July 08
Surveying - II

Time: 3 hrs.

Max. Marks:100

- Note :1. Answer any FIVE full questions choosing at least two from each part.**
2. Assume reasonable missing data, if any.

Part A

- 1 a. Differentiate between the following as applied to a transit Theodolite
 - i) Face left and face right observation. (08 Marks)
 - ii) Plunging and swinging of telescope. (07 Marks)
 - iii) Horizontal axis and line of collimation (05 Marks)
 - iv) Plate bubble and altitude bubble. (05 Marks)
- b. Explain the repetition method of measuring horizontal angles with a transit theodolite. Discuss the advantages of the method. (07 Marks)
- c. What are the fundamental lines of a theodolite? What should be the inter relationships between them? (05 Marks)

- 2 a. Explain with a neat sketch the method of prolonging a straight line when,
 - i) The instrument is in good adjustment. (10 Marks)
 - ii) The instrument is in poor adjustment. (10 Marks)
- b. Mention the objective, test and adjustment of the plate level. (10 Marks)

- 3 a. Explain the method of finding the reduced level of the top of the given object whose base is inaccessible by double plane method. (08 Marks)
- b. Mention the advantages of total station over the conventional instrument. (02 Marks)
- c. Find the elevation of top of the chimney from the following data:

Instrument station	Reading on BM	Angle of elevation	Remarks
A	0.862	18°36'	RL of BM = 421.380 m
B	1.222	10°12'	Distance AB = 50 cm

Stations A and B and top of chimney are in the same vertical line. (10 Marks)

- 4 a. Write short notes on the following:
 - i) Anallactic lens. (08 Marks)
 - ii) Tachometric constants. (02 Marks)
 - iii) Beaman's stadia arc. (02 Marks)
- b. Mention the clear difference between internal focusing telescope and external focusing telescope. (02 Marks)
- c. A tacheometer is setup at an intermediate point on a traverse course PQ and the following observations are made on a vertically held staff.

Staff station	Verticle angle	Staff interrupt	Axial gair readings
P	+8°36'	2.350	2.105
Q	+6°6'	2.055	1.895

The instrument is fitted with an anallactic lens and the constant is 100. Compute the length of PQ and reduced level of Q, that of P being 321.500 meters. (10 Marks)

Part B

- 5 a. What are the different methods of setting out a simple curve? (03 Marks)
 b. Calculate the ordinates at 7.5 mt intervals for a circular curve, given that the length of long chord is 60 mt and the radius 180 m. (07 Marks)
 c. Two tangents intersect at chainage of 1000 mt, the deflection angle being 28° . Calculate all the necessary data to set out a simple curve of 250 mt radius by Rankines method and tabulate the results, peg interval = 20 mt, least count of theodolite = 20". (10 Marks)
- 6 a. Two straight lines with a total deflection angle of $72^\circ 30'$ are to be connected by a compound curve of two branches of equal length. The radius of the first arc is 350 mt and that of the second arc is 500 mt and the chainage of vertex is 1525 mt. Find the chainages of two tangent points and that of point of compound curvature. (10 Marks)
 b. Two parallel railway lines are to be connected by a reverse curve of different radii. If the lines are 10 mt apart and maximum distance between tangent points measured parallel to the straights is 45 mt, calculate the radius of the second branch if that of the first branch is 65 mt. Also calculate the length of both the branches. (10 Marks)
- 7 a. What is transition curve? Why and where these curves are provided? List the conditions to be fulfilled by a transition curve. (07 Marks)
 b. What are vertical curves and where they are used? (03 Marks)
 c. A transition curve is required for a circular curve of 200 mt radius, the gauge being 1.5 mt and maximum superelevation restricted to 15 cm. The transition is to be designed for a velocity such that no lateral pressure is imposed on the rails and the rate of gain of radial acceleration is 30 cm/sec^3 . Calculate the required length of the transition curve and the design speed. (10 Marks)
- 8 a. What is Simpsons rule? Derive the expression for it. (10 Marks)
 b. The following readings were obtained when an area was measured by a planimeter, the tracing arm being set to a natural scale. The initial and final readings were 2.268 and 4.582. 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 the constant C of the instrument = 26.430
 i) Calculate the area of the figure.
 ii) If the area of the figure drawn to a scale of 1 inch = 64 feet, find the area of the figure. (10 Marks)
