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B TECH

(SEM-III) THEORY EXAMINATION 2018-19

SURVEYING

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

a. What is meant by 'Tie line'?
b. What are the factors on which precision of survey-depends?
c. What is a well conditioned triangle?
d. Define Bench mark. How is it established?
e. Distinguish between a True Bearing and Magnetic Bearing.
f. What is tangential tacheometery?
g. What are face left and face right observations?
h. What is error due to incorrect Centring of Instrument?
i. What is reciprocal leveling? Where one can use this leveling?
j. List the various types of curves.

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a. Describe briefly the methods of plotting compass traverse? How is it adjusted?
b. Derive the expressions for horizontal and vertical distances in the fixed hair method when the staff is held normal to the line of sight and measured angle is that of elevation.
c. A theodolite was set up at a point *P* and a staff was kept at a station *Q*. The distance *PQ* was 3010 m. If the angle of elevation to a vane 3.5 m above the foot of the staff was 7º59'. Determine the reduced level of the station *Q*. The elevation of the instrument axis was 120.80 m. Apply correction due curvature and refraction.
d. What is an anallactic lens? In which telescope is it used? What is the condition under which the additive constant is zero with an anallactic lens? Also, calculate the stadia interval when, the readings on a staff held vertically 60 m from a tachometer were 1.460 and 2.055. The line of sight was horizontal. The focal length of the objective lens was 24 cm and the distance from the objective lens to the vertical axis was 15 cm.
e. Why is a curve provided? What is a degree of a curve? Derive a relation between the radius and degree of a curve.

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

(a) The distance between two points A and B measured along a slope is 504 m. Find the horizontal distance between A and B when
  i. The angle of slope is 120
  ii. The slope is 1 in 45
  iii. The difference in elevation of A and B is 65 m.

(b) A 20 m chain was found to be 6 cm long after chaining a distance of 3800 m. It was tested again at the end of day's work and found to be 9 cm too long after chaining a total distance of 7000 m. If the chain was correct before the commencement of the work, find the true distance.

4. Attempt any *one* part of the following: 10 x 1 = 10

(a) a dumpy level was set up exactly mid-way between two pegs A and B, 80 m apart. The readings on the staff when held on the pegs A and B were 1.865 and 1.780 respectively. The instrument was then moved and setup at a point C on the line BA produced and 16 m from A. The respective staff readings on A and B were 1.620 and 1.550. Calculate the staff readings on A and B to give a horizontal line of sight.

(b) The following consecutive readings were taken with a level and 3 meter levelling staff on continuously sloping ground at a common interval of 20 meters:
0.602, 1.234, 1.860, 2.574, 0.238, 0.914, 1.936, 2.872, 0.568, 1.824 and 2.722. R.L of the first point was 192.122. Rule out a page of a level field book and enter the above readings. Calculate the R.L's of the points and also, the gradient of the line joining the first and the last points.

5. Attempt any *one* part of the following: 10 x 1 = 10

(a) What do you mean by contour? Describe the characteristics of contour.

(b) What is Tacheometer? State the situations where it is used. Explain methods of determination of Tacheometric constants.

6. Attempt any *one* part of the following: 10 x 1 = 10

(a) What is a "Compound Curve"? Describe in a few sentences, how this curve differs from other ones.

(b) A Circular curve has been set off touching the line AB and BC at points A and C respectively. If the angles CBA is 156° and the minimum distance from point B to the curve is 20 m, Calculate
   i. The length of the lines AB and BC and
   ii. Area bounded by the lines AB and BC and the Curve.

7. Attempt any *one* part of the following: 10 x 1 = 10

(a) The following observations were taken from stations P and Q.

Line	Length (m)	Bearings
PA	125	S $60^0$30' W
PQ	200	N $30^0$30' E
QB	150.5	S $50^0$15' W

Calculate the length and bearing of AB, and also the angles PAB and QBA.

(b) What is orientation in Plane Table surveying? Distinguish between Resection and Intersection methods as applied to Plane table surveying.