

CBCS SCHEME

USN

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15CT43

Fourth Semester B.E. Degree Examination, June/July 2018 Surveying – II

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Explain the temporary adjustments of a theodolite. (10 Marks)
 b. Define the terms:
 (i) Transiting (ii) Horizontal axis (iii) Line of sight
 (iv) Face left and face right observation. (06 Marks)

OR

- 2 a. Name the fundamental axes of theodolite. (06 Marks)
 b. Explain the repetition method of measuring horizontal angles with a transit theodolite. (06 Marks)
 c. What are the permanent adjustments of a transit theodolite? (04 Marks)

Module-2

- 3 a. An instrument was set up at P and the angle of depression to a vane 2 m above the foot of the staff held at 'Q' was $5^\circ 36'$. The horizontal distance between P and Q was known to be 3000 metres. Determine the R.L. of the staff – station Q, given that staff reading on a B.M. of elevation 436.050 was 2.865 metres. (06 Marks)
 b. Find the elevation of top of the chimney from the following data:

| Instrument station | Reading on BM | Angle of elevation | Remarks |
|--------------------|---------------|--------------------|-----------------------|
| P | 2.870 | $28^\circ 42'$ | RL of BM = 287.28m |
| R | 3.750 | $18^\circ 6'$ | Distance PR = 100 mts |

Station P and R and top of chimney are in the same vertical line. (10 Marks)

OR

- 4 a. Explain with neat sketch when Base of the object is accessible. (06 Marks)
 b. Find the RL of a church spire 'C' from the following observations taken from two stations A and B, 50 mts apart. $\angle BAC = 60^\circ$, $\angle ABC = 50^\circ$.
 Angle of elevation from A to top of spire = 30°
 Angle of elevation from B to top of spire = 29°
 Staff reading from A on BM of RL 20 m = 2.50 mts
 Staff reading from B to same BM = 0.500 mts (10 Marks)

Module-3

- 5 a. Write short notes on the following :
 (i) Anallactic lens (ii) Tacheometric constants. (06 Marks)
 b. Compute the gradient of line AB, when the tacheometer observations are made the observations are made from intermediate point along line AB. RL of plane of collimation = 100.000 : RL of inst. axis = 100.000 m. (10 Marks)

| Point | V. A | Staff reading | |
|-------|----------------|---------------------|---------|
| A | $+2^\circ 0'$ | 1.880, 1.405, 0.930 | K = 100 |
| B | $-0^\circ 18'$ | 2.990, 1.950, 0.900 | C = 0 |

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Define the following with sketches:
 (i) Simple curve (ii) Compound curve (iii) Reverse curve (iv) Transition curve. (06 Marks)
- b. A 10° curve is introduced between straight at an intersection angle of $32^\circ 30'$. Compute
 (i) Radius of curve (ii) Length of curve (iii) Tangent length (iv) Long chord
 (v) Apex distance.
 Angle at the centre subtended by an arc at chord of 20 mts. (10 Marks)

Module-4

- 7 a. What are conditions to be fulfilled by a transition curve and functions of transition curves? (06 Marks)
- b. A compound curve consisting of two simple circular curves of radii 350 m and 500 m is to be laid out between two straight T_1I and IT_2 . PQ is the common tangent at point of compound curvature D. The angles IPQ and IQP are respectively 50° and 25° , sketch and calculate the tangent lengths T_1I and IT_2 . (10 Marks)

OR

- 8 a. Sketch the different types of vertical curve. (06 Marks)
- b. A reverse curve ACB is to be set out between two parallel straights 30 m apart. The distance between two tangent points A and B is 120 mts. Find
 (i) The radius R if $R_1 = R_2 = R$ and $D_1 = D_2$
 (ii) The radius R_2 , if $R_1 = 100$ m.
 Also calculate the lengths of both the arcs of reverse curve. (10 Marks)

Module-5

- 9 a. Plot the following cross-staff survey of a field ABCDEFG and calculate its area. (07 Marks)

| | | |
|-------|-----|-------|
| | 750 | D |
| | 650 | 210 E |
| C 180 | 490 | |
| | 300 | 250 F |
| B 160 | 180 | |
| | 100 | 50 G |
| | 0 | A |

- b. The following perpendicular offsets were taken from a chain line to a hedge.
 Chainage (m) : 0 15 30 45 60 70 80 100 120 140
 Off-sets (m) : 7.60 8.5 10.70 12.8 10.6 9.5 8.3 7.9 6.4 4.4
 Calculate the area between the survey line, the hedge and the end offsets by
 (i) Trapezoidal rule (ii) Simpson's rule. (09 Marks)

OR

- 10 a. The perimeter of a fig is traversed clockwise with the anchor point inside and with the tracing arm so set that one revolution of the roller measured 100 sq. cm on the paper. The initial and final readings are 2.828 and 9.836. The zero mark of the disc passed the fixed index mark twice in the reverse direction. The area of the zero circle is found to be 2352 sq.cm. Find the area of the figure. (06 Marks)
- b. A railway embankment is 10 m wide with side slopes $1\frac{1}{2}$ to 1. Assuming the ground to be level in a direction transverse to the centre line, calculate the volume contained in length of 120 mts, the centre heights at 20m intervals being in mts. 2.2, 3.7, 3.8, 4.0, 3.8, 2.8, 2.5. (10 Marks)
