

CBCS SCHEME

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15CT43

Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019 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 following terms :
i) Face left and face right observation
ii) Clamp screw and tangent screw
iii) Plunging and swinging of the telescope. (06 Marks)
- b. Explain the procedure for extending a straight line using a transit when it is in adjustment and not in adjustment. (10 Marks)

OR

- 2 a. With neat sketches and tabular column explain measurement of reiteration method. (08 Marks)
- b. What is spire test? With net sketch, explain how it is carried. (08 Marks)

Module-2

- 3 a. Derive expression for the horizontal distance, vertical distance and the elevation of an elevated object by double plane method, when the base is inaccessible. (08 Marks)
- b. The top (Q) of a chimney was sighted from two stations P and R at very different levels, the stations P and R being in a line with the top of the chimney. The angle of elevation from P to the top of the chimney was $38^{\circ}21'$ and that from 'R' to the top of the chimney was $21^{\circ}18'$. The angle of elevation from R to a vane 2m above the foot of the staff held at P was $15^{\circ}11'$. The heights of instruments at P and R were 1.87m and 1.64m respectively. The horizontal distance between P and R was 127m and the reduced level of R was 112.78m. Find the RL of the top of the chimney and horizontal distance from P to the chimney. (08 Marks)

OR

- 4 a. What is a total station? List out the advantages of total station. (08 Marks)
- b. To find the elevation of the top (Q) of a hill, a flag staff of 2m height was erected and observations were made from two stations P and R, 60 meters apart. The horizontal angle measured at P between R and the top of the flag staff was $60^{\circ}30'$ and that measured at R between the top of the flag staff and P was $68^{\circ}18'$. The angle of elevation on the top of the flag staff P was measured to be $10^{\circ}12'$ at P. The angle of elevation to the top of the flag staff was measured to be $10^{\circ}48'$ at R. staff readings on Benchmark. When the instrument was P = 1.965m and that with the instrument at R = 2.0558m. Calculate the elevation of the top of the hill if that of B.M was 435.065m and apply the check also. (08 Marks)

Module-3

- 5 a. Write a note on :
i) Anallatic lense ii) Subtense diaphragm (04 Marks)
- b. Explain the method of determining the constant of a technometer, in the field. (04 Marks)
- c. Two straights AB and BC Intersect at a Chainage of 4242.0m. The angle of intersection of 140° . It is required to set out a 5° simple circular curve to connect the straights. Calculate all the data necessary to set out the curve by method of offsets from the chord produced with an interval of 30m. (08 Marks)

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. Derive the expression for distance and elevation when staff is held vertical and the line of sight is inclined. (08 Marks)
- b. Two straight AI and BI meet at a Chainage of 3450m. A right handed simple circular curve of 250m radius joins them. The deflection angle between the two straights is 50° . Tabulate the necessary data to layout the curve by Rankin's method of deflection angles. Take chord interval as 20m. (08 Marks)

Module-4

- 7 a. With neat sketch, explain the various elements of a compound curve. Derive the relation for calculating the Chainages of tangent points. (08 Marks)
- b. A road of 8m wide is to be defect through an angle of 60° with the centre line of radius of 300m, the chainage of the intersection point being 3605.0m a transition curve is to be used at each end of the circular curve of such a length that the rate of gain of radial acceleration is 0.5m/s^2 , when the speed is 50Km/h. Find out :
 i) Length of the transition curve
 ii) Super elevation
 iii) Chainage at all junction points
 iv) Offsets at $x = \frac{L}{4}, \frac{L}{2}, \frac{3L}{4}$ and L . (08 Marks)

OR

- 8 a. Two straights are intersected at a point I, KM and $\angle MKA$ is 140° and angle of $\angle KMC$ is 145° , Radius of first arc is 600m and that of second arc is 400m. Find of chainage of tangent point and point of compound curvature, given that chainage of point of intersection is 34/5m. (10 Marks)
- b. What is a transition curve? Explain the requirements of a transition curve. (06 Marks)

Module-5

- 9 a. Discuss the methods for determining areas and volumes. (06 Marks)
- b. The following perpendicular offsets were taken from a chain line to a edge.

Chainage (m)	0	15	30	45	60	70	80	100	120	140
Offsets (m)	7.6	8.5	10.7	12.8	10.6	9.5	8.3	7.9	6.4	4.4

Calculate area between surveying line, the hedge and end offsets by

- (i) Trapezoidal rule (ii) Simpson's rule. (10 Marks)

OR

- 10 a. What is Simpson's rule? Derive expression for it. (06 Marks)
- b. A railway embankment 400m long if 12m wide at the formation level and has side slopes of 2 to 1. The ground levels at every 100m along the centre line are as under

Distance	0	100	200	300	400
RL	204.8	206.2	207.5	207.2	208.3

The formation level at zero chainage is 207.00 and the embankment has a rising gradient of 1 in 100. The ground is level across the centre line. Calculate volume of earth work.

(10 Marks)
