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5E3154

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B. Tech. V Sem.(Main/Back) Exam. Dec. 2012
Civil Engg.
5CE4 Surveying-II

Time : 3 Hours **SMaximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five questions.** Seclecting **one question** from **each unit.** All Question carry **equal** marks. (Schematic diagrams must be show n wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. **Nil** 2. **Nil**

UNIT-I

Q.1 (a) Explain how will you determine the elevation difference between two stations by single observation. Derive expression for elevation differ--ence for angle of elevation. Support your answer with a proper and neat sketch. 10

(b) Following reciprocal observations were made from two stations P and Q

Horizontal distance between two stations - 7000m

Angle of elevation from P to Q - $1^0\ 58'\ 20''$

Angle of depression from Q to P - $1^0\ 59'\ 12''$

Height of signal at P- 4.10m

Hight of signal at Q- 3.90m

Height of Instrument at P- 1.47m

Height of Instrument at Q- 1.58m

Find the difference in level between P and Q.

Take R Sin i''= 30.88m 6

OR

Q.1 (a) Explain how well you determine the reduced level of top of a T. V. tower, when two instrument positions are in same vertical plane. Also derive the expression for the same. 10

(b) Following observations were taken to determine the reduced level of top of an over head tank when instrument positions were in different vertical plane. The observations are as under-

(i) Angle of elevation from station A to top of tank- 10^0 12′

(ii) Angle of elevation from station B to top of tank 10^0 48′

(iii) The distance between A & B = 50m

(iv) Horizantal angle at A- 68^0 18′

(v) Horizantal angle at B- 60^0 30′

(vi) Staff reading on B.M from A- 1.965m

(vii) Staff reading on B.M. from B- 2.055m

If the RL of B.M. is 301m, calculate the RL of top of tank. 6

UNIT-II

Q.2 (a) Enumerate the methods of setting out simple circular curve. Explain the method perpendicular offset from long chord to set out simple circular curve. 6

(b) Two tangents intersects at a chainage 1190m the deflection angle being 36^0. Calculate necessary data for setting out simple circular curve by Rankine's tangential angle method. The radius of curve is 300m, take normal chord length as 20m. 10

OR

Q.2 (a) Explain the methods of computing length of transition curve. 6

(b) Two straights AB and BC are connected by compound curve. If deflection angle of first curve is 40° 30′ and second curve is 36° 24′ respectively. The radius of first curve is 600m and that of second curve is 800m. If the chainage of Intersection point is 8200m, find the chainage of tangent points T_1 and T_2 and point of compound curveture (pcc). 10

UNIT-III

Q.3 (a) What do you understand by well conditioned triangle? What is the importance of a well conditioned triangle in trianglulation? Derive the condition for a well conditioned triangle. 8

(b) Two triangulation stations A & B are 100km apart having elevations 180m and 450m respectively. The intervening obstruction situated at C is 70km from A, has elevation 245m. Ascertain if A and B are intervisible or not. If A and B are not-visible then find the height of signal at B so that the line of sight must no where be less than 3m above ground surface. 8

OR

Q.3 (a) What is the necessity of a satellite station in the triangulation? How the centre to reduction is done if satellite station is selected in triangulation network. 8

(b) A tape 30m long of standard length at 29°c was used to measure base line. Measurement were made at mean temp. 15°c the tape standardised at a pull 10kg. Level difference between two pegs was observable as 0.23m. If the measured length between two pegs is 25.265m, find the corrected length between two pegs.

$E=2\times10^6$ kg/cm², $\alpha = 116\times10^{-7}$ per 1°c. Area of cross-section of tape is 0.5cm² and applied pull 8.5kg. 8

UNIT-IV

Q.4 (a) What do you understand by weight of a quantity? Explain the laws of weights with suitable examples. 8

(b) Find the most-probable values of angles A & B from the following observa -tions -

$A = 42^0\ 20'\ 30.4''$ - wt - 1
$B = 36^0\ 18'\ 25.2''$ - wt - 2
$A+B = 78^0\ 38'\ 50.3''$ - wt - 3 8

OR

Q.4 Explain what do you understand by station or figure adjustment. Explain the adjustment of a triangle with central station by method of least square. 16

UNIT-V

Q.5 (a) Make neat sketch and explain following

(i) Plane of ecliptic (ii) Equinoctial points
(iii) Solastices (iv) Celestial Equator

Also write the values of declination on the solastices and equinoctial points. 8

(b) Explain astronomical corrections. 8

OR

Q.5 (a) Following Ex-meridian observation to sun were taken in the month of November-

(i) Horizontal angle between reference line and sun - $130^0\ 25'\ 15''$

(ii) Observed altitude of sun - $26^0\ 27'\ 16''$

(iii) Arerage observed time - 15h 38m 17"

(iv) Sun's declination at 0 GMT $18^0 35'\ 17.5''$ S increasing 28.12" per hour.

(v) Latitude of the place is $25^0\ 10'$ N

Compute the true bearing of reference line from above data and show by a neat- sketch. 12

(b) Make a neat sketch of astronomical triangle and write the great circles forming this triangle and its components. 4
