53 (CE 401) SURV-II

2018

SURVEYING–II

Paper : CE 401

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. *(a)* What is the principle of two theodolite method of setting out circular curve? Write its procedure. 8

   (b) What is GPS? Write a short note on application of GPS. 6

   (c) What is triangulation survey? Name different systems of triangulation. 6

2. *(a)* Define : 5×2

(i) Compound Curve

(ii) Point of Tangency

(iii) Point of Curve

(iv) Simple circular curve

(v) Tangent length.

(b) Determine the gradient from point *A* to *B* from the following observations made with a tacheometer fitted with an anallactic lens. The constant of the instrument was 100 and staff was held vertically. 10

Instrument station	Staff point	Bearing	Vertical angle	Staff readings
P	*A*	134°	+10°32′	1·365, 1·915, 2·475
	B	224°	−5°7′	1·055, 1·965, 2·855

3. *(a)* A series of offsets were taken from a chain line to a curved boundary line at intervals of 15*m* in the following order : 0, 2·56, 3·91, 3·84, 4·52, 3·21, 4·05, 5·71*m*. Compute the area between the chain line, the curved boundary and the end offsets by (a) Trapezoidal rule (b) Simpson's rule (c) Average Ordinate rule. 10

(b) Write down the procedure to set out a simple circular curve by method of offsets from chords produced. 10

4. *(a)* The scale of an aerial photograph is $1cm = 160m$, and the size of the photograph is $20cm \times 20cm$. If the longitudinal lap is 65% and side lap is 30%, determine the number of photographs required to cover an area of $240km^2$. 5

(b) What is photogrammetry ? Differentiate between a map and an aerial photograph. 5

(c) Explain with the help of a neat diagram, an idealized remote sensing system. 10

5. *(a)* Explain *any two* methods of determining intervisibility between triangulation stations. 10

(b) From a satellite station S, $5{\cdot}8m$ from the main triangulation station A, the following directions were observed :

A	0°0′0″
B	132°18′30″
C	232°24′6″
D	296°6′11″

The length AB, AC and AD were computed to be $3265{\cdot}5m$, $4022{\cdot}2m$ and $3086{\cdot}4m$ respectively. Determine the directions of AB, AC and AD. 10

6. (a) An excavation is made for a reservoir $20m$ long and $10m$ wide at the bottom, having the side of the excavation slope at 1 in 2. Calculate the volume of excavation if the depth is $4m$. The ground surface is level before excavation. 5

(b) Write a note on application of remote sensing. 5

(c) Two straight lines AB and BC are intersected by a line D_1D_2. The angles BD_1D_2 and BD_2D_1 are 40°30′ and 36°24′ respectively. The radius of the first arc is $600m$ and that of the second arc is $800m$. If the chainage of intersection point B is $8250{\cdot}2m$, find the chainage of tangent points and point of compound curve. 10

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