

Total number of printed pages – 7 **B. Tech**
CPCE 8307

Sixth Semester Examination – 2008

SURVEYING – II

Full Marks – 70

Time : 3 Hours

*Answer Question No. 1 which is compulsory
and any **five** from the rest.*

*The figures in the right-hand margin
indicate marks.*

1. Answer the following questions : 2 × 10
- (i) State the difference between fixed hair and movable hair methods of tacheometry.
 - (ii) Write four advantages of tacheometric surveying.



- (iii) How does triangulation differ from trilateration ?
- (iv) A line AB measures 11.0cm on a photograph taken with a camera having a focal length of 21.5 cm. The same line measures 3cm on a map drawn to a scale of 1/45,000. Calculate the flying height of the aircraft, if the average altitude is 400m.
- (v) Differentiate between Polar orbiting satellite and Geo-stationary satellite.
- (vi) What is the necessity of a satellite station in triangulation survey ?
- (vii) Find up to what vertical angle, sloping distance may be taken as horizontal distance in stadia work, so that the error may not exceed 1 in 300, assuming $C = 0$, and staff held vertical.

(viii) How does a tacheometer differ from a theodolite ?

(ix) State briefly the basic principle of E.D.M.

(x) Write four uses of contour maps.

2. (a) What is Gale's traverse table ? Discuss the procedure for recording the various entries in the table. 5

(b) The particulars of a traverse survey are given below :

Line	Length (m)	Bearing
AB	150	342° 00'
BC	513	14° 00'
CD	315	137° 00'

Calculate the distance between a point E, on AB 100 m from A, and a point F on CD, 125 m from C. 5

3. (a) What are the various methods employed in Tacheometric survey ? 3

(b) To determine the elevation of a station P in a tacheometric survey the following observations were made with the staff held vertical. The instrument constants were $K = 100$ and $C = 0$

Instrument Station	Height of Instrument(m)	Staff Station	Vertical angle	Staff readings
O	1.45	B.M	- 6°30' 00"	1.355, 1.895, 2.460
O	1.45	Change Point	+ 8°45' 30"	0.780, 1.265, 1.745
P	1.40	Change Point	- 7°00' 00"	1.155, 1.615, 2.075

Calculate the reduced level of P, if that of the B.M is 100 m. 7

4. (a) What are the functions of (i) signals and (ii) towers ? Describe various types of signals and their suitability. What is meant by phase of a signal ? 5

(b) Two triangulation stations A and B are 40 km apart and have elevations of 178 m respectively. Find the minimum height of signal required at B, so that the line of

sight may not pass nearer the ground than 3m. The intervening ground may be assumed to have a uniform elevation of 150m. 5

5. (a) Write a brief note on **remote sensing** and state its various uses. 5

(b) The image of a hill is 90 mm from the centre of the photograph. The elevation of the hill is 650 m and the flying height is 4500 m with respect to the datum. How much is the image displaced due to the elevation of the hill ? 5

6. An area 40 km long in the north-south direction and 36 km in the east-west direction is to be photogrammetrically surveyed with a camera of focal length 300 mm. The photograph size is 20 cm x 20 cm. The average scale is to be

1:15000 effective at an elevation of 450 m above datum. End lap is to be at least 60% and the side lap is 30%. The ground speed of the aircraft is 220km/hour. The flight lines are to be laid in a north-south direction on an existing map at scale 1 : 60,000. Calculate the data for flight plan. 10

7. (a) What are the points to be borne in mind for selecting a geodetic triangulation station ? 3

(b) From a satellite station S, 8.6 m from the main triangulation station A, the following directions were observed :

$$\angle A = 00^\circ 00' 00''$$

$$\angle B = 123^\circ 36' 40''$$

$$\angle C = 242^\circ 42' 08''$$

$$\angle D = 301^\circ 15' 26''$$

The length AB, AC and AD were calculated to be 2563.8 m, 4220.7 m and 3680.5 m respectively. Determine the directions of AB, AC and AD. 7

8. (a) Describe the various characteristics of contours with neat sketches. 5
- (b) Explain the basic features of a total station. 5
