



PART – B

(5×13=65 Marks)

11. a) A steel tape 20 m long standardised at 55° F with a pull of 10 Kg was used for measuring a base line. Find the correction per tape length, if the temperature at the time of measurement was 80° F and pull exerted was 16 Kg. Weight of 1 cubic cm of steel = 7.86g, weight of tape = 0.8 Kg and $E = 2.109 \times 10^6$ Kg/cm². Coefficient of expansion of tape per 1° F = 6.2×10^{-6} .

(OR)

- b) Observations were made from instrument station A to the signal at B. The sun makes an angle of 60° with the line BA. Calculate the phase correction if i) the observation was made on the bright portion and ii) the observation was made on the bright line. The distance AB is 9460 metres. The diameter of the signal is 12 cm.

12. a) Adjust the following angles closing the horizon.

$$A = 110^\circ 20' 48'' \quad \text{wt. 4}$$

$$B = 92^\circ 30' 12'' \quad \text{wt. 1}$$

$$C = 56^\circ 12' 00'' \quad \text{wt. 2}$$

$$D = 100^\circ 57' 04'' \quad \text{wt. 3}$$

(OR)

- b) The following observations of three angles A, B, C were taken at one station.

$$A = 75^\circ 32' 46''.3 \quad \text{wt. 3}$$

$$B = 55^\circ 09' 53''.2 \quad \text{wt. 2}$$

$$C = 108^\circ 09' 28''.8 \quad \text{wt. 2}$$

$$A + B = 130^\circ 42' 4''.6 \quad \text{wt. 2}$$

$$B + C = 163^\circ 19' 22''.5 \quad \text{wt. 1}$$

$$A + B + C = 238^\circ 52' 9''.8 \quad \text{wt. 1}$$

Determine the most probable value of each angle.

13. a) Discuss about the types of EDM measurements.

(OR)

- b) Discuss about the working principle of Geodimeter in total station.

14. a) Explain various segments of GPS.

(OR)

- b) Discuss the types of GPS receivers.

15. a) A simple circular curve is to have a radius of 573 m. The tangents intersect at chainage 1060 m and the angle of intersection is 120°. Find 1) Tangent distance 2) chainage at beginning and end of the curve, 3) Length of long chord, 4) Degree of the curve, 5) Number of full and sub chords.

(OR)

- b) Explain in detail about the route surveys for highways project.

PART – C

(1×15=15 Marks)

16. a) Two straights AB and CD intersect at V. BD is the common tangent of length 200 meters. It is proposed to introduce a reverse curve consisting of two arcs of equal radii between them. The angles ABD and CBD are 150°30' and 43° 42' respectively. Calculate the common radius, the chainages of point of curve, point of reverse curve, point of tangency if that of B is 9245.2 m.

(OR)

- b) The following observations of the sun were taken for azimuth of a line in connection with a survey.

Mean time = 16 h 30 m

Mean horizontal angle between the sun and the referring object 18° 20' 30".

Mean corrected altitude = 33° 35' 10"

Declination of the sun from N.A. = ± 22° 05' 36"

Latitude of place = 52° 30' 20"

Determine azimuth of line.

