14630
B. Tech 4th Semester Examination
Surveying-II (N.S.)
CE-224

Time : 3 Hours                 Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all selecting one question from each section A, B, C and D and all subparts of Section E are compulsory.

SECTION - A

1. (a) Two parallel railway lines are to be connected by a reverse curve. If the lines are 10m apart, the maximum distance between tangent points measured parallel to the straight is 50 m find:

   (a) radius R if \( R_1 = R_2 = R \)

   (b) radius \( R_2 \) if \( R_1 = 50 \text{m} \)

   Also calculate the length of both curves. \((14)\)

   (b ) Discuss the characteristics of a transition curve by the method of tangential method. \((6)\)

2. Describe the weight of quantities. How weight of different quantities are allocated? Discuss various laws of weights. \((20)\)
3. (a) A base line was measured with steel tape which was exactly 30 m at 20°C at a pull of 100N. The measured length was 1500.00 m. If the temperature during measurement was 28°C and pull applied was 150N determine correct length of line if cross section area of tape = 2.5 mm² coefficient of expansion 3.5×10⁻⁶ per °C Modulus of elasticity = 2.1 × 10³ N/mm².  

\[(15)\]  
(b) Differentiate between triangulation & trilateration.  

4. Two triangulation stations A & B 60 km above having elevations of 265m & 285m resp. the intervening ground may be assumed to have a uniform elevation of 220m. Find the minimum height of signal at B so that the line of sight may not pass near the ground less than 3 m.  

\[(20)\]  

SECTION - C  

5. Draw the expression to determine the height of the object when the two instruments stations are not in the same vertical plane.  

\[(20)\]  

6. Following observations were made in trigonometric levelling.  

- Observed altitude = 3° 10' 49"  
- Height of instrument = 1.24m  
- Height of signal = 5.32 m  
- Horizontal distance = 4935m  
- Coefficient of refraction = 0.07  
- \[R\sin|'' = 30.88m\]  

correct the observed attitude for the height of signal, refraction and curvature.  

\[(20)\]
SECTION - D

7. Explain in detail the basic geometric characteristics of aerial photographs. (20)

8. (a) A rectangular agricultural field measures 8.65cm long & 5.13 cm wide on a vertical photograph having scale of 1:20,000. Find area of field. (6)

(b) What is the significance of equation of time? How do we calculate the local time at a location? (14)

SECTION - E

9. Attempt all parts:

(a) If the first chord gradient is 0.16, calculate the gradient of fourth chord.

(b) What is the basic criteria for the design of transition curves?

(c) Differentiate between triangulation & traversing.

(d) Define “extension of base line”.

(e) How do you account correction for curvature of earth in trignometric levelling?

(f) What is ‘axis-signal correction’?

(g) Define “tilt displacement” in photogrammetry.

(h) What is “station adjustment”?

(i) How sidereal time is converted to mean time?

(j) Explain most probable value. (2x10=20)