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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 $R_1 = 50m$

   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)

SECTION - B

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 crossection area of tape = 2.5 mm^2 coefficient of expansion $3.5×10^{-6}$ per °C Modulus of elasticity = $2.1 × 10^3$ N/mm^2.   (15)

    (b) Differentiate between triangulation & trilateration.   (5)

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 trignometric 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

    Rsin|$''$ = 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. (2×10=20)