Roll No ....

CE-303-CBGS
B.Tech., III Semester
Examination, December 2020
Choice Based Grading System (CBGS)
Surveying
Time : Three Hours

Maximum Marks : 70

Note: i)   Attempt any five questions.

ii) All questions carry equal marks.

iii) In case of any doubt or dispute the English version question should be treated as final.

1. a)   Derive the expressions for horizontal and vertical distances in the fixed hair method when the staff is held normal to the line of sight and measured angle is that of elevation. 7

    b)   The following fore and back bearings were observed in traversing with a compass in place where local attraction was suspected: 7

Line	F.B.	B.B
AB	38°30	219° 15
BC	100°45	278° 30
CD	25°45	207° 15
DE	325°15	145°15

Find the corrected fore bearing and the true bearing of each of the lines given that the magnetic declination was 10°W.

10°W

2. a) Describe principle of triangulation system and show schematically different sets of triangulation figures.   7

   b) Stadia readings were taken with a theodolite on a vertical staff with the telescope inclined at an angle of depression of 3° 30′. The staff readings were 2.990, 2.055 and 1.120. The reduced level of the staff station is 100.000m, and the height of the instrument is 1.40m. What is the reduced level of the ground at the instrument? Take constants as 100 and zero.   7

   3° 30′ Ho

   2.055   100.000

3. a) Derive an expression for the horizontal distance of a vertical staff from a tacheometer if the line of sight of the telescope is horizontal.   7

   b) Two points A and D are connected by a traverse survey ABCD and the following records are obtained AB = 219m; BC = 170.5m; CD = 245.75m Angle ABC = 118° 15', Angle BCD = 180° 40'. Assuming that AB is in meridian, determine:
   i) The latitude and departure of D relative to A.
   ii) The length AD
   iii) The angle BAD

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D

AB = 219 'r.;   ;
CD = 245.75 'r.   15',   U
BCD = 180° 40'   B
$a|
i)   A
ii)
iii)

4. a)   A transition curve is required for a circular curve of 400m radius, the gauge being 1.5m between rail centre and maximum super-elevation restricted to 12cm. The transition to be designed for a velocity such that no lateral pressure is imposed on the rails and the rate of gain of the radial acceleration is 30cm/sec^3. Calculate the required length of transition curve and the design speed.
400

1.5

30   3

   b)   What is meant by 'shift' of a curve? Derive an expression for the same.   7

5. a)   Explain Aerial photography and it's uses in civil engineering.   7

   b)   What is sounding in Hydrographic survey? Explain. 7