**18CV35**

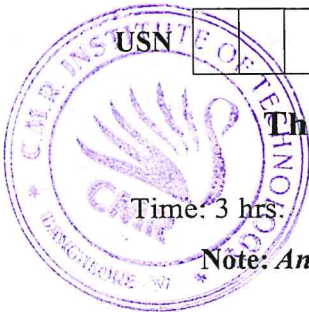## Third Semester B.E. Degree Examination, Aug./Sept.2020
### Basic Surveying

Time: 3 hrs.                                                                    Max. Marks: 80

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

1 a. Distinguish between : (i) Plane survey and Geodetic survey. (ii) Plan and map. (iii) Accuracy and precision. **(06 Marks)**

   b. What is ranging? Explain indirect or reciprocal ranging with neat sketch. **(08 Marks)**

   c. A line was measured by a 20 mt chain which was accurate before starting the day's work. After chaining 900 mt, the chain was found to be 6 cms too long. After chaining a total distance at 1575 mt, the chain was found to be 14 cms too long. Find the true distance at the line. **(06 Marks)**

### OR

2 a. How is chaining performed on sloping ground by Direct method? Explain. **(06 Marks)**

   b. Explain the Basic Principles of surveying. **(06 Marks)**

   c. In chaining pasta pond, stations A and D on the main line, were taken on the opposite sides of the pond. On the Left of AD, a line AB, 200 mt long was laid down and a second line, AC 250 mt long was ranged on the right of AD, the points B, D and C being in the same straight line. BD and DC were then chained and found to be 125 mt and 150 mt respectively. Find the length of AD. **(08 Marks)**

### Module-2

3 a. Distinguish between :
   (i) Magnetic meridian and True Meridian    (ii) WCB and QB.
   (iii) Isgonic line and Agonic line. **(06 Marks)**

   b. Differentiate between prismatic compass and surveyor's compass. **(06 Marks)**

   c. Following bearing were observed with a compass. Calculate the interior angles. **(08 Marks)**

| Line | AB | BC | CD | DE | EA |
|------|-----|------|------|--------|-------|
| Fore bearing | 60°30′ | 122°0′ | 46°0′ | 205°30′ | 300°0′ |

### OR

4 a. Define : (i)  True menedian and time bearing.
   (ii)  Isogonic line and Agonic line.
   (iii)  Fore bearing and Back bearing. **(06 Marks)**

   b. The following are the bearings of a closed traverse ABCDEA. At what stations, do you suspect the local attraction? Find the corrected bearings of the lines. **(07 Marks)**

| Line | FB | BB |
|------|---------|---------|
| AB | 124°30′ | 304°30′ |
| BC | 68°15′ | 246°0′ |
| CD | 310°30′ | 135°15′ |
| DA | 200°15′ | 17°45′ |

   c. In the following traverse ABCDE, the length and bearing of line EA is omitted, calculate the length and bearing of line EA. **(07 Marks)**

| Line | Length (m) | Fore Bearing (FB) |
|------|------------|-------------------|
| AB | 204.0 | 87°30′ |
| BC | 226.0 | 20°20′ |
| CD | 187.0 | 280°0′ |
| DE | 192.0 | 210°03′ |
| EA | ? | ? |

## Module-3

5 a. Define the following terms:
   (i) Benchmark  (ii) Back sight  (iii) MSL  (iv) Reduced Level. **(04 Marks)**
   b. Explain the temporary adjustments of Dumpy level. **(07 Marks)**
   c. Following consecutive readings were taken with a level and a 4 mt leveling staff on a continuously sloping ground at common interval at 30 mt.
   0.855 (on A), 1.545, 2.335, 3.115, 3.825, 0.455, 1.380, 2.055, 2.855, 3.455, 0.585, 1.015, 1.850, 2.755, 3.845 (on B).
   The R.L of A was 380.500 mt. Make entries in a level book format and apply the usual check. Also determine the gradient at the line AB. **(09 Marks)**

**OR**

6 a. Define the following terms:
   (i) Benchmark  (ii) Reciprocal leveling  (iii) Height of Instrument
   (iv) Change point **(06 Marks)**
   b. Explain the temporary adjustments of Dumpy level. **(07 Marks)**
   c. The following staff reading were observed successively with a level, the instrument having been moved after 3$^{rd}$, 6$^{th}$ and 8$^{th}$ readings:
   2.228, 1.606, 0.988, 2.090, 2.864, 1.262, 0.602, 1.982, 1.044, 2.684
   Enter the readings in level book format and calculated RL of all the points by Rise and Fall method if the first reading was taken with a staff held on Benchmark of elevation 432.384 mt. **(07 Marks)**

## Module-4

7 a. List the advantages and disadvantages of plane table surveying. **(08 Marks)**
   b. What is the practical utility of three-point point? **(04 Marks)**
   c. Explain Radiation and intersection method of plane table surveying. **(08 Marks)**

**OR**

8 a. Explain the term orientation of plane table. Discuss orientation by back sighting. **(06 Marks)**
   b. List the methods of plane table surveying. Explain radiation method. **(07 Marks)**
   c. What is three-point problem? How is it solved graphically by Bessel's method? **(07 Marks)**

## Module-5

9 a. Define a contour. Explain the characteristics of contour. **(08 Marks)**
   b. The following perpendicular offsets were taken at 10 mt intervals from a survey time to an irregular boundary line : 3.25, 5.60, 4.20, 6.65, 8.75, 6.20, 3.25, 4.20, 5.65
   Calculate the area enclosed between the survey line, the irregular boundary line and the first and last offset by the applications of,
   (i)   Average ordinate rule.
   (ii)  Trapezoidal rule.
   (iii) Simpson's rule. **(12 Marks)**

**OR**

10 a. Discuss the methods of determining volumes. **(06 Marks)**
   b. List the uses of contours. **(04 Marks)**
   c. A Railway embankment is 10 mt wide with side slopes $1\frac{1}{2}:1$. Assuming the ground to be level in a direction transverse to the centre line, calculate the volume contained in a length of 120 mt, the centre heights at 20 mt intervals being in meters.
   2.2, 3.7, 3.8, 4.0, 3.8, 2.8, 2.5
   Use Trapezoidal and Prismoidal rules. **(10 Marks)**

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