

**VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY (VSSUT), ODISHA**  
**Even Mid Semester Examination for Academic Session 2024-25**

COURSE NAME: B.Tech

SEMESTER: 4<sup>th</sup>

BRANCH NAME: Civil Engineering  
SUBJECT NAME: Surveying and Geomatics

FULL MARKS: 30

TIME: 90 Minutes

Answer All Questions.

The figures in the right hand margin indicate Marks. *Symbols carry usual meaning.*

- Q1. Answer all Questions. [2 × 3]
- a) Differentiate between plane survey and geodetic survey. - CO1
  - b) How to perform leveling when the BM is above the line of collimation? - CO2
  - c) Write the differences between declination, dip of needle. - CO3

- Q2. [4+4]
- a) A river is flowing from west to east. For determining the width of the river, two points A and B are selected on the southern bank such that distance AB = 100 m. Point A is westwards. The bearings at a tree C on the northern bank are observed to be 40° and 340°, respectively from A and B. Calculate the width of the river. - CO1
  - b) Write down the classification of surveying.

OR

- c) A survey line ABC crossing a river at right angles cut its banks at B and C. To determine the width BC of the river, the following operation was carried out. A 60 m long line BE was set out roughly parallel to the river. Line CE was extended to D and mid-point F of DB was established. Then EF was extended to G such that FG = EF. Line DG was extended to cut the survey line ABC at H. GH and HB were measured and found to be 40 m and 80 m, respectively. Find the width of the river. - CO1
- d) Write down the general principle of surveying.

- Q3. [4+4]
- a) A line was measured with a steel tape which was exactly 30 m at a temperature of 20°C and a pull of 10 kg. The measured length was 1650 m. The temperature during measurement was 30°C and the pull applied was 15 kg. Find the true length of the line, if the cross-sectional area of the tape was 0.025 cm<sup>2</sup>. The coefficient of expansion of the material of the tape per °C is  $3.5 \times 10^{-6}$  and modulus of elasticity of the material of tape is  $2.1 \times 10^6$  kg/cm<sup>2</sup>. - CO2
  - b) Write down the different method and instrument used to draw perpendicular offset in chain surveying.

OR

- c) The following consecutive staff readings were taken with a 4 m staff, the level - CO2



having been moved forward after 2<sup>nd</sup>, 6<sup>th</sup> and 9<sup>th</sup> readings: 0.585, 2.955, 1.855, 1.265, 2.925, 0.35, 2.35, 2.855, 1.655, 2.685, and 2.435. The RL of the first point is 101.65m. Enter the readings in level book and apply usual checks. Find the difference of RL of first and last points. [NOTE: Use Height of Instrument Method]

d) What is reciprocal leveling? Explain it with the help of sketch.

Q4.

[4+4]

a) The following are the bearings of the lines of a closed traverse ABCD.

- CO3

Line	Fore Bearing
AB	N 45°10' E
BC	S 60°40' E
CD	S 9°50' W
DA	N 80°40' W

Calculate the interior angles of the traverse.

b) Write the difference between surveyor and prismatic compass

OR

c) The following bearings were taken in running a closed compass traverse while surveying in Jhansi, Allahabad: - CO3

Line	F.B.	B.B.
AB	48°25'	230°00'
BC	177°45'	356°00'
CD	104°15'	284°55'
DE	165°15'	345°15'
EA	259°30'	79°00'

(i) State the stations which are affected by local attraction and by how much.

(ii) Determine the correct bearings.

d) Write the difference between true bearing and magnetic bearing. Calculate the true bearings, if the declination was 1°30' W for the above compass traverse data.