

**SURVEYING - I**  
(Civil Engineering)

Time: 3 hours

Max. Marks: 70

**PART - A**  
(Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
- Distinguish between plane and geodetic surveying.
  - Define well condition triangle and offset in chain surveying.
  - Find the magnetic declination at a place, if the magnetic bearing of the sun at noon is  $184^\circ$ .
  - List out the accessories of a plane table surveying.
  - Define curvature and refraction in leveling.
  - List out the various uses of contours.
  - What is meant by transiting and face left observation in theodolite surveying?
  - List out the methods of balancing the traverse.
  - Define the terms two level section and three level sections.
  - List out the uses of Abney level.

**PART - B**  
(Answer all five units, 5 X 10 = 50 Marks)**UNIT - I**

- 2 Discuss about the classification of surveying:

- Based on object of survey.
- Based on instruments employed.

**OR**

- 3 A tape was exactly 30 m long at  $20^\circ\text{C}$  when palced on the flat under a pull of 75 N. A survey line was measured with this tape under a pull of 120 N and found to be 810 m. The average temperature during the measurement was  $30^\circ\text{C}$ . If the tape was supported in spans of one tape length each time, determine the corrected length of the tape. The cross-sectional area of the tape is  $4\text{ mm}^2$ . The unit weight of the material of the tape is  $7.8 \times 10^{-5}\text{ N/mm}^2$ . The modulus of elasticity of the material of the tape is  $2.1 \times 10^5\text{ N/mm}^2$ . The coefficient of linear expansion of the material of the tape is  $11.7 \times 10^{-6}/^\circ\text{C}$ .

**UNIT - II**

- 4 The following were observed in a compass traverse. Correct for local attraction.

Line	Fore bearing	Back bearing
AB	$44^\circ 30'$	$226^\circ 45'$
BC	$124^\circ 30'$	$303^\circ 15'$
CD	$181^\circ 00'$	$1^\circ 00'$
DA	$289^\circ 30'$	$108^\circ 30'$

**OR**

- 5 List out methods of plane tabling and explain any one method with a neat sketch.

**UNIT - III**

- 6 The following staff readings were observed with a level and a 4 m staff on a continuously sloping ground at a common interval of 15 m: 0.880, 1.635, 2.055, 2.530, 3.085, 3.580, 1.255, 2.060, 2.465, 3.740, 1.035, 1.145, 1.730 and 2.645. The reduced level of the first point was 780.150. Rule out a page of a level-book and enter the above readings. Calculate the reduced levels and the gradient of the line joining the first and last points.

**OR**

- 7 Explain about the characteristics of contours with neat sketches.

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**UNIT - IV**

8 Define horizontal angle. List out the methods of measuring horizontal angle and explain any one method in detail.

OR

9 For the following traverse, compute the length CD, so that A, D and E may be in one straight line.

Line	Length in metres	Bearing
AB	110	83° 12'
BC	165	30° 42'
CD	-----	346° 06'
DE	212	16° 18'

**UNIT - V**

10 The following offsets were taken from a chain line to a hedge.

Distance (m)	0	6	12	18	24	36	48	60	72	81	90
Offset (m)	3.8	3.3	2.4	1.8	0.9	1.5	1.8	2.2	3.0	3.3	3.6

Calculate the area enclosed between the chain line, the hedge and the end offsets by:

- Simpson's rule.
- Trapezoidal rule.

OR

11 Briefly explain about the used and working principle of following instruments:

- Optical square.
- Pantagraph.

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