

22301

23124

3 Hours / 70 Marks

Seat No.

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- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answer with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following: **10****
- a) State the principle of plane table survey.
 - b) Define – Swinging and Transiting.
 - c) Define – Face left and Face right.
 - d) Recall the formula for calculating horizontal distance by using tacheometer when line of sight is horizontal and staff held vertical.
 - e) Classify horizontal and vertical curve.
 - f) State two uses of EDM.
 - g) State uses of GPS.

P.T.O.

2. Attempt any THREE of the following: 12

- State the functions of any four accessories of plane table survey.
- Explain the procedure of measurement of horizontal angle by transit theodolite.
- Describe the field method of determining constants of tacheometer.
- Draw labelled sketch of simple circular curve.

3. Attempt any THREE of the following: 12

- Explain the procedure of measurement of magnetic bearing of line using transit theodolite.
- Explain the procedure of measurement of horizontal angle using total station.
- List any four function keys of total station with its uses.
- State different sources of errors in GIS.

4. Attempt any THREE of the following: 12

- Compare Radiation and Intersection method of plane table survey on any four points.
- State the checks to be applied in a closed traverse.
- Find the missing measurement. The survey data of a traverse is given in a table below. The length and bearing of one side were not recorded during the survey.

| LINE | Length (m) | Bearing |
|------|------------|----------|
| AB | 201.8 | 315° 0' |
| BC | 288.4 | 60° 30' |
| CD | 192.6 | 145° 15' |
| DA | ? | ? |

- The following observations were made by tacheometer. Find the constant of tacheometer.

| Distance | 50 m | 100 m |
|---------------|------------------|------------------|
| Staff reading | 1.23, 1.45, 1.73 | 1.34, 1.85, 2.34 |

- Explain the procedure of setting out a simple circular curve by offsets from long chord method.

5. Attempt any TWO of the following:

12

- a) Calculate Latitude and Departure of all the survey line of following traverse.

| LINE | Length (m) | WCB |
|------|------------|----------|
| AB | 160.2 | 120° 0' |
| BC | 142.2 | 18° 30' |
| CD | 200.4 | 220° 0' |
| DA | 120.2 | 333° 30' |

- b) The following included angles are measured in a closed traverse ABCDEA.

$$\angle A = 87^\circ 50' 20'', \quad \angle B = 114^\circ 55' 40'', \quad \angle C = 94^\circ 38' 50'', \\ \angle D = 124^\circ 40' 40'', \quad \angle E = 112^\circ 54' 30''$$

If the bearing of line AB is $221^\circ 18' 40''$. Calculate bearing of remaining lines.

- c) A tacheometer fitted with analytic lens was set up at 'A' and the following reading were obtained on staff held vertically. Assume multiplying constant 100 and RL of BM = 100 m.

| Inst. Station | Staff Station | Vertical angle | Staff readings |
|---------------|---------------|----------------|------------------|
| A | BM | + 5° 0' | 1.10, 1.37, 1.62 |
| A | B | -2° 0' | 1.23, 1.24, 1.33 |

Find –

- i) The distance AB.
- ii) RL of B.

6. Attempt any TWO of the following:

12

- a) Describe stepwise procedure for preparation of layout of small building by total station.
- b) State salient features of digital theodolite. Also state uses of digital theodolite.
- c) Compare Active Passive system of remote sensing with three points. Also state the application of remote sensing in civil engineering.