Con. 10084-13.   **GX-12176**

(3 Hours)   [Total Marks : 80

N.B. :(1) Solve any **four** questions.
(2) Illustrate answers with neat **sketches.**
(3) Assume **suitable** data, if **required** and state the **same clearly.**
(4) Attempt subquestions in order only.
(5) **Figures** to the **right** indicate **full** marks.

1. Compare the following (any **four**) :–   **20**
   (a) Plane surveying and Geodetic surveying.
   (b) Direct ranging and Reciprocal ranging.
   (c) Prismatic compass and Surveyor's compass.
   (d) Trapezoidal rule and Simpson's rule.
   (e) Magnetic declination and Dip of the needle.

2. (a) State and explain the principles of surveying with neat sketches?   **5**
   (b) A closed traverse is run anticlockwise in the form of regular pentagon ABCDEA.   **5**
       If the fore bearing of traverse leg AB is 30000'. Find the bearings of the
       remaining traverse legs?
   (c) The following bearings were observed in the area where local attraction was   **10**
       suspected. Determine the correct magnetic bearings? Also calculate true bearings
       if the declination is + 03°30'.

Line	FB	B. B.
PQ	S 40°30' W	N 41°15'E
QR	S 80°45' W	N 79°30' E
RS	N 19°30' E	S 20°00' W
SP	S 80°00' E	N 80°00' W

3. (a) Which are the common difficulties faced in levelling operation? How the same   **5**
       will you overcome?
   (b) What is meant by sensitiveness of bubble tube? Explain how it can be determined.   **5**
   (c) The following successive readings were taken along line PQ with a 4m levelling   **10**
       staff and a level on a continuously sloping ground at 15m interval. The readings
       are : 0·345 (on P), 1·450, 2·630, 3·875, 0·655, 1·745, 2·965, 3·945, 1·125,
       2·475, 3·005 and 3·865 (on Q). The R. L. of station P is 60·000m. Find the
       gradient of Line PQ?

4. (a) Describe repetition and reiteration methods of determining horizontal angle using   **8**
       transit? Also state the errors eliminated by these methods?

TURN OVER

(b) Balance the following closed traverse using Bowditch's rule or Transit rule. **12**

Line	Length (m)	Bearing
PQ	78.00	51°00'
QR	203.10	77°10'
RS	149.01	167°10'
SP	152.70	240°00'
TP	210.12	310°20'

5. (a) Describe various methods of plane table surveying? **8**
   (b) The perpendicular offsets taken at 10m interval from a survey line to an irregular **12** boundary line are 0·510m, 2·25m, 3·40m, 2·40m, 3·30m, 4·20m, 5·10m, 7·35m, 8·70m, 2·60m and 1·50m. Determine the area enclosed by :−
   (i) Mid ordinate rule.
   (ii) Average ordinate rule.
   (iii) Trapezoidal rule.
   (iv) Simpson's rule.

6. Write short notes on (any **four**) :− **20**
   (a) Reciprocal levelling.
   (b) Zero circle.
   (c) Characteristics of contours.
   (d) Spire test.
   (e) Orientation in PTS.
   (f) Gale's traverse table.