16172

3 Hours / 100 Marks   Seat No.

Instructions :   (1)   All Questions are *compulsory.*

(2)   Answer each next main Question on a new page.

(3)   Illustrate your answers 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 TEN :**   **20**

(a)   State the principles of survey.

(b)   State the object of surveying.

(c)   Define Ranging.

(d)   State the principle of optical square.

(e)   What is True Meridian ?

(f)   Define line of collimation.

(g)   What is magnetic declination ?

(h)   Define long offset and short offset.

(i)   What is negative staff reading ?

(j)   What is local attraction ?

(k)   Define contour interval and horizontal equivalent.

(l)   Draw contours of valley and Ridge line.

(m) What is advantage of wing telescopic alidade ?

(n) List any four components of polar planimeter.

(o) Define "Bearing of a line'.

2. **Attempt any FOUR :** 16

(a) Differentiate between plane and geodetic survey.

(b) A 30 m chain was tested before commencement of chaining work. Line PQ was chained by it and observed length of PQ was 1230 m. The chain was tested at the end of days work and was found to be 12 cm too short.

Find the correct distance PQ.

(c) Draw conventional symbol for :
   (i) Cutting
   (ii) Embankment
   (iii) Marshy land
   (iv) Forest

(d) Convert following bearing from R.B to WCB :
   (i) N 30° 30' E
   (ii) S 60° E
   (iii) S 70° 30' W
   (iv) N 65° W

(e) State the fundamental lines of dumpy level and give their relationship.

(f) What is Bench Mark ? State the types of bench mark and explain any one type.
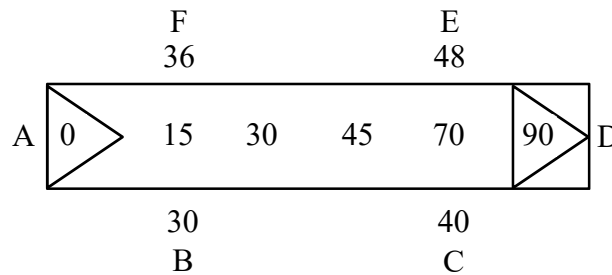
3. **Attempt any FOUR :** 16

(a) Explain with example, establishing grade contours.

(b) Explain temporary adjustment of plane table.

(c) An irregular area was measured with planimeter keeping anchor point inside the figure. The IR was 8.495 and FR was 4.325. The zero crosses fixed index mark twice in clockwise direction. Find the area of figure using m = 100 and c = 22.

(d) Explain intersection method of plane table survey.

(e) Define following terms :

   (i) Level surface

   (ii) Datum line

   (iii) Reduced level

   (iv) Axis of telescope

(f) State any four uses of total station.

4. **Attempt any FOUR :** 16

(a) State the uses of surveying.

(b) Explain the procedure of chaining on sloping ground.

(c) Draw a neat labelled sketch of 30 m metric chain.

(d) Plot the following cross staff survey of field and calculate its area in m^2 as shown in Fig. No. 1.

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           F                    E
           36                   48
     ┌─────────────────────────────────┐
   A │ 0 ▷   15    30    45    70  90 ▷ │ D
     └─────────────────────────────────┘
           30                   40
           B                    C
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All dimension in mm.

Fig. No. 1

(e) Draw a neat sketch of optical square. Explain its working.

(f) Explain traversing method of plane table surveying.

5. **Attempt any FOUR :** 16

    (a) Explain the errors in chaining.

    (b) Explain the method to overcome an obstacle in chaining, where vision and chaining both are obstructed.

    (c) Calculate interior angles in a closed traverse PQRST by following bearings :

Line	FB
PQ	S 37° 30' E
QR	S 43° 15' W
RS	N 74° W
ST	N 11° E
TP	N 57° 45' E

    (d) Describe the advantages of Auto level.

    (e) Explain with sketch characteristics of contour line.

    (f) What is orientation of plane table ? Explain back sighting method of orientation.

6. **Attempt any TWO :** 16

    (a) The following readings were taken with a level and 4 m staff. Draw up a level book page and calculate recued levels by height of instrument method. 0.578, 0.933, 1.768, 2.450, 3.005, 0.567, 1.181, 1.888, 3.679, 0.612, 0.705 and 1.810. The instrument was shifted after 5th & 9th reading. The RL of first station is 58.250 m. Apply usual check.

    (b) List any eight component parts of prismatic compass and state their functions.

    (c) The following consecutive readings were recorded with a dumpy level and 4 m levelling staff : 2.505, 2.875, 3.150, 0.950, 3.515, 3.150, 0.870, 1.240, 1.450 and 0.810. The level was shifted after fourth and seventh reading. The first reading was taken on a B.M. having RL is 200.000 m. Calculate the reduced level of stations, using rise and fall method. Apply arithmetical check. Also calculate the difference of level between first station and last station.

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