17310

13141

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. a) **Attempt any <u>SIX</u> of the following:**   **12**

i)   State the principles of survey.

ii)   Define ranging.

iii) State the principle of optical square.

iv)   Define long offset and short offset.

v)   State the principle of plane table survey.

vi)   Define line of collimation.

vii) Enlist the component of prismatic compass.

viii) What is True Meridian ?

Marks

b) **Attempt any <u>TWO</u> of the following:**   **08**

    i)   What is perpendicular and oblique offset ?

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

    iii) Explain with neat sketch differential levelling.

2.   **Attempt any <u>FOUR</u> of the following:**   **16**

a) What is plane and geodetic survey ?

b) Explain with neat sketch the procedure of indirect ranging.

c) State the procedure of setting offsets with optical square.

d) Compare whole circle bearing and quadrantal bearing system.

e) Explain temporary adjustment of plane table.

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

3.   **Attempt any <u>FOUR</u> of the following:**   **16**

a) Draw conventional symbol for:

    i)   Cutting

    ii)   Embankment

    iii) Marshy land

    iv) Forest.

Marks

b) Explain the procedure of chaining of sloping ground.

c) Explain with neat sketch the construction of optical square.

d) B and C are two points on the opposite banks of a river along a chain line ABC which crosses the river at right angles to the bank. From a point P which is 150m from B along the bank, the bearing of C is 305° 30' and the bearing of A is 215° 30'. If the length AB is 200m, find the width of river.

e) Calculate back bearing for following bearings:

   i)   135° 30'

   ii)   230°

   iii) S 40° 30' W

   iv)   N 50° W.

f) Convert following bearing from R.B to W.C.B.

   i)   N 30° 30' E

   ii)   S 60° E

   iii) S 70° 30' W

   iv)   N 65° W.

4.   Attempt any <u>FOUR</u> of the following: **16**

a) State the code of signals for ranging.

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

c) Plot the following cross staff survey of field and calculate its area in m^2 as shown in Fig. No. 1.
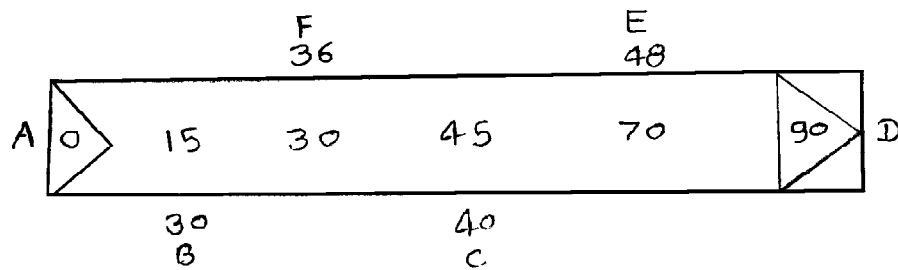
Line AD → All dimensions in metres

<u>Fig. No. 1</u>

d) What is temporary adjustment of prismatic compass ?

e) What is fore bearing and back bearing of line and give their relationship ?

f) Given below are the bearings observed in a closed traverse. Determine which of the stations are affected by local attraction. State the values of corrected bearings.

Line	FB	BB
AB	124° 30'	304° 30'
BC	68° 15'	246° 00'
CD	310° 30'	135° 15'
DA	200° 15'	17° 45'

5. **Attempt any FOUR of the following:** **16**

a) Explain with neat sketch open and close traverse.

b) State the different accessories with their use for plane table survey.

c) What is orientation of plane table ? Explain back sighting method of orientation of plane table survey.

d) Explain intersection method of plane table survey.

e) Define the following terms used in levelling:

   i) Level surface

   ii) Datum line

   iii) Reduced level

   iv) Axis of telescope.

f) What is temporary adjustment of dumpy level ?

6. **Attempt any TWO of the following:** **16**

a) The following readings were taken with a level and 4m staff. Draw up a level book page and calculate reduced 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 and 9th reading. The R.L. of first station is 58.250m. Apply usual checks.

b) What are the sources of errors in levelling ? What precautions should be taken to guard against it ?

Marks

c) Below is the page of a level book in which some of the readings are missing and are marked as 'X'. Find the values of the missing readings. Calculate RL's of all points. Apply usual checks.

Level page of the field book

Stn.	B.S.	I.S.	F.S.	Rise	Fall	R.L.	Remarks
A	×					275.000	B.M.
B	1.060		1.975		1.500	×	C.P.1
C		1.550			×	×	
D		×			×	272.440	
E	2.380		1.785	×		×	C.P.2
F	1.325		0.895	×		×	C.P.3
G			×	×		×	Last point

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