22205

12425

3 Hours / 70 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.

Marks

1. Attempt any FIVE of the following : **10**

(a) State the classification of surveying based on the instruments used.

(b) Define : (i) Base Line (ii) Check Line.

(c) Define : (i) Whole Circle Bearing (ii) Reduced Bearing.

(d) Write any two field conditions where change point is necessary in levelling.

(e) Define : (i) Contour Interval (ii) Horizontal Equivalent.

(f) State the methods adopted for computation of areas of irregular figure.

(g) Define : (i) Topographic Survey (ii) Hydrographic Survey.

2. Attempt any THREE of the following : **12**

(a) Convert the following bearing of lines from RB to WCB :

(i) N 60°30' W

(ii) S 59°30' E

(iii) N 45°30' E

(iv) S 51°30' W

(b) Write any four differences between plane surveying and geodetic surveying.

(c) Define :

(i) Back Sight (ii) Intermediate Sight (iii) Fore Sight (iv) Change point.

(d) Explain the graphical method of adjustment of closing error of a traverse.

3. Attempt any THREE of the following : **12**

(a) Draw conventional symbols for :

(i) House

(ii) Compound Wall

(iii) Fort

(iv) Dam

(b) Explain local attraction. How will you detect on field ?

(c) Compare between HI method and Rise and Fall method. (Any four points)

(d) List the sources of errors in levelling and explain any one in detail.

4. Attempt any THREE of the following : **12**

(a) Explain the temporary adjustments of Dumpy Level on field.

(b) Draw a neat sketch of contour for the following topographical features :

(i) Hill (ii) Valley (iii) Steep Slope (iv) Gentle Slope.

(c) Draw a neat labelled diagram of 'digital planimeter' showing all the parts. Also list any four functional keys with their symbols.

(d) Explain the procedure of computing the volume by Trapezoidal formula with the help of neat sketch.

(e) The following are the consecutive readings taken with a dumpy level and a 4 m levelling staff on a continuously sloping ground at staff station chainage of 30 m interval :

0.965, 1.100, 1.245, 1.680, 2.100 and 2.345.

The RL of first chainage point was 500 m. Calculate the RL of remaining points by Rise and Fall method. Apply usual arithmetical checks.

5. Attempt any TWO of the following : **12**

(a) Construct the plot ABCDE with a suitable scale from the following data as shown in figure number 01 collected in chain and open cross survey on the field and calculate the area of the plot in m^2. All readings are in 'm'.

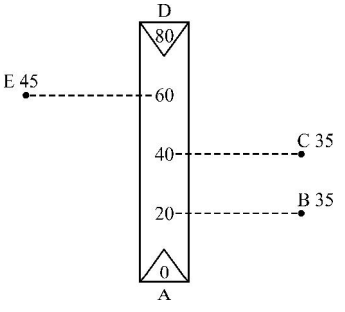

Figure No. 01

(b) Calculate the back bearing and included angles of a closed traverse PQRST from the table number 01 and apply usual checks.

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

Table No. 01

(c) The following readings were taken by a dumpy level and a 4 m levelling staff :

0.570, 0.935, 1.760, 2.450, 3.005, 0.560, 1.185, 1.880, 3.670, 0.615, 0.705 and 1.810

The level was shifted after 5^{th} and 9^{th} reading. The first reading was taken on staff held at BM of RL 58.250 m. Rule out a page of level book to enter all the readings and calculate the RL of all station points. Apply usual check.

6. Attempt any TWO of the following : **12**

(a) The fore bearing and back bearing observed in a closed traverse ABCDA are shown in table number 02. Solve for local attraction and calculate the corrected fore bearing and corrected back bearing of the lines.

Line	Fore Bearing	Back Bearing
AB	46°10'	226°10'
BC	119°20'	298°40'
CD	169°30'	351°10'
DA	280°20'	99°20'

Table No. 02

(b) Calculate the marked '×' missing readings in the level page of a field book given in table number 03. Apply usual checks.

Staff Station	BS (m)	IS (m)	FS (m)	HI (m)	RL (m)	Remark
1	2.650			×	100.000	BM
2		3.740			×	
3		×			98.820	
4	4.640		×	×	98.380	CP.1
5		0.380			×	
6	×		×	103.700	102.060	CP.2
7		2.840			×	
8	×		3.480	104.900	×	CP.3
9			×		102.700	Last Point

Table No. 03

(c) From the contour survey data as shown in figure number 02, draw a 104 m contour line by linear interpolation method using arithmetic calculations. The grid size is of 10 m × 10 m. Show all the calculations.

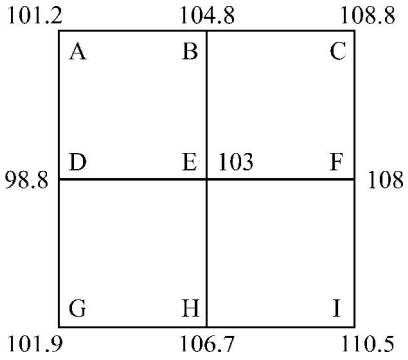

Figure No. 02