312339

12526

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 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 any two purposes of survey.

b) Define base line and check line.

c) State any two uses of theodolite.

d) Define the term line of sight.

e) Define plane survey and geodetic survey.

f) State any two accessories of plane table with their use.

g) Define principle of plane table surveying.

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

a) Draw symbols used in chain survey map for the following :–
   i)   Embankment
   ii) Dam
   iii) Pond
   iv) Electric line with pole.

Marks

b) Compare WCB and R.B. with minimum four points.

c) Explain why zero is marked at south end on a graduated circle of prismatic compass with sketch.

d) Explain the procedure of measuring vertical angle using theodolite with sketch.

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

a) Convert the following W.C.B. to R.B. :–
   i)   309° 30'
   ii)   143° 30'
   iii) 270° 30'
   iv)   46° 30'

b) Define 'changing the face' of theodolite. Describe the procedure of changing the face.

c) Explain measurement of magnetic bearing of line with theodolite with sketch.

d) Explain the radiation method of plane table survey with neat sketch.

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

a) Explain any one method of orientation in detail with relevant sketch.

b) The co-ordinates of two points C and D are as follows.

Points	Co-ordinates
P	982.50; 825.30
Q	1198.60; 576.40

Find length and bearing of line PQ.

c) State any four characteristics of contour lines with neat sketch.

d) Explain temporary adjustment of dump level.

e) Explain the sources of errors in levelling for :–
   i)   Instrumental error
   ii)   Personal error
   iii) Climatic error.

Marks

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

a) The following are bearing taken on a closed compass traverse ABCDEA :–

Line	F.B.	B.B.
AB	80°10'	259°0'
BC	120°20'	301°50'
CD	170°50'	350°50'
DE	230°10'	49°30'
EA	310°20'	130°15'

Compute interior angles and find the corrected included angles.

b) Following are the length and bearing of traverse.

Line	Lengh 'm'	Bearing
AB	260	30°
BC	325	140°
CD	185	210°

Find length and bearing of line DA.

c) Contour survey data of a field is shown in Figure No 1 below. Draw 89.00 m contour line by linear interpolation method. Show all the calculations. Grid size is 5 m × 5 m.
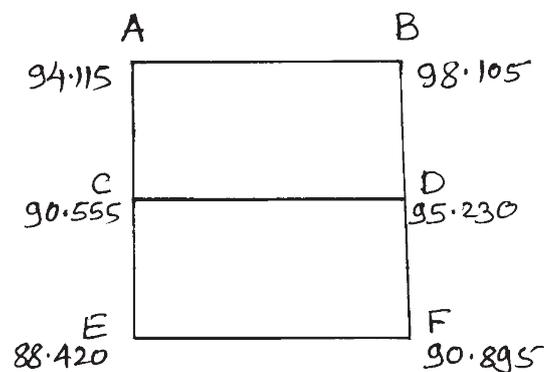
A   B
94.115 ⌐————————⌐ 98.105

          C   D
90.555 |————————| 95.230

          E   F
88.420 ⌐————————⌐ 90.895

Fig. No. 1

6. **Attempt any <u>TWO</u> of the following:** 12

a) Find the corrected consecutive co-ordinates applying Bowdich's Rule for traverse PQRSTP from following data given below:–

Line	Length m	Consecutive co-ordinates	
		Latitude	Departure
PQ	70	+21.50	−65.450
QR	80	−80.755	−5.250
RS	43	−41.00	+13.550
ST	38	−14.250	+35.150
TP	115	+114.150	+22.315

b) The following consecutive readings were recorded with dumpy level and a 4 m levelling staff :

2.505, 2.875, 3.150, 0.950, 3.515, 3.150, 0.870, 1.240, 1.450, 0.810.

The level was shifted after fourth and seventh reading. The first reading was taken on a B.M. having R.L. as 200.00 m. Calculate reduced levels of all stations by using Rise and fall method. Apply arithmetic check. Also calculate the difference of level between first and last station.

c) Find the missing readings marked as 'X' and apply the usual check.

Staff St.	B.S.	I.S.	F.S.	Rise (+)	Fall (−)	R.L.	Remark
1	2.345					129.50	B.M.
2	1.650		×	0.035			CP$_1$
3		2.210			×		
4	×		1.850	×			CP$_2$
5	1.850		1.925		0.455		CP$_3$
6			×	0.37		129.25	Last Point

————