22232
3 Hours / 70 Marks

Seat No. | | | | | | | | |

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

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

1. Attempt any FIVE of the following : **5 × 2 = 10**

(a) State the principles of surveying.

(b) Define Base line and Tie line.

(c) Define whole circle bearing and reduced bearing.

(d) Define True meridian and Magnetic meridian.

(e) Define Back sight and foresight.

(f) Define contour and contour interval.

(g) Write prismoidal formula and trapezoidal formula.

2. Attempt any THREE of the following : **3 × 4 = 12**

(a) Define surveying and state its objects.

(b) Define : (i) Closed traverse

(ii) Open Traverse

(iii) Dip of Magnetic Needle

(iv) Magnetic Declination

(c) Convert the following bearing into relevant bearing system :

(i) N 30 °E

(ii) S 50 °W

(iii) 320°

(iv) 170°

(d) Explain the procedure for profile levelling with neat sketch.

3. Attempt any THREE of the following : **3 × 4 = 12**

(a) Explain indirect ranging with neat sketch.

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

(c) Explain in brief about differential and fly levelling.

(d) Differentiate between H.I. method and Rise and fall method. (any four points)

4. Attempt any THREE of the following : **3 × 4 = 12**

(a) Explain temporary adjustments of dumpy level.

(b) What is fly levelling ? When it is carried out ?

(c) State any four uses of contour map.

(d) Explain the procedure of computing the volume of reservoir from any contour map.

(e) Explain stepwise procedure to measure area of irregular figure using digital planimeter.

5. Attempt any TWO of the following : **2 × 6 = 12**

(a) Plot the following cross staff survey of the field ABCDEF from given Fig. 1 and calculate its area in sq. m.

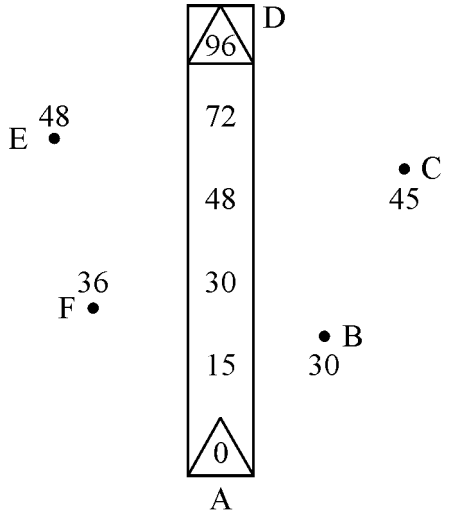

Fig. 1

(b) The following fore bearings were observed in running a compass traverse, given in Table 1.

Find the back bearings. Included angles and apply checks.

Line	FB
PQ	124° 30'
QR	68° 15'
RS	310° 30'
SP	200° 15'

(Table 1)

(c) The series of staff readings observed on a continuously sloping ground are 0.850, 1.650, 2.450, 3.255, 0.655, 1.250, 1.955, 2.650, 3.250, 1.150, 1.655, 2.055 and 3.255. The first reading was taken on a BM of RL 150 M. Calculate the RI of all points by H.I. method. Apply usual check.

6. Attempt any TWO of the following : **2 × 6 = 12**

(a) Find the missing readings. Calculate RL of all stations. Apply arithmetic check. (Refer Table 2).

Station	BS	IS	FS	Rise	Fall	RL	Remark
1	2.345					129.50	BM
2	1.650		–	0.035			CP1
3		2.210			–		
4	–		1.850	–			CP2
5	1.850		1.925		0.455		CP3
6			–	0.37		129.00	BM2

(Table 2)

(b) Points P and Q are two ground points at a distance of 20 m with their reduced levels are 75.380 & 78.260 m respectively. Interpolate the contours of 76, 77 & 78 m.

(c) The following conservative readings were recorded with a 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 & Fall method. Apply arithmetic check. Also calculate the difference of level between first and last station.