

312339

23242

3 Hours / 70 Marks

Seat No.

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- 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 any two uses of surveying.
- (b) Define offset and enlist types of offset.
- (c) Enlist any four component of transit theodolite.
- (d) State any two uses of theodolite.
- (e) Enlist types of benchmarks.
- (f) Define :
 - (i) Contour interval
 - (ii) Horizontal equivalent
- (g) State principle of plane table survey.



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

- (a) Draw symbols used in chain survey map for the following :
 - (i) Cutting
 - (ii) Wall with gate
 - (iii) Orchard
 - (iv) Electric post
- (b) Describe the procedure of indirect ranging with neat sketch.
- (c) Describe the temporary adjustments of transit theodolite.
- (d) Describe the procedure of fly levelling with neat sketch.

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

- (a) Convert the following R.B. into W.C.B. :
 - (i) N 55° 30' E
 - (ii) S 60° 20' E
 - (iii) N 47° 20' E
 - (iv) S 39° 30' W
- (b) Describe the procedure of measurement of horizontal angle by repetition method using transit theodolite.
- (c) State any four uses of contour map.
- (d) Enlist accessories used in plane table survey and state function of each of them.

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

- (a) Find the length and bearing of line AB, if two co-ordinates A & B are as given below :

Point	Co-ordinate
A	870.30, 777.00
B	1150.20, 575.30

- (b) State fundamental axis and lines of theodolite and give relations between them.
- (c) The following consecutive readings were taken with a level and a 4 m levelling staff on continuously slopping ground at a common interval of 30 m : 0.585 on A, 0.936, 1.953, 2.846, 3.644, 3.938, 0.962, 1.035, 1.689, 2.534, 3.844, 0.956, 1.979, 3.016 on B. The elevation of A was 520 · 450 m. Make a page of level book and apply usual checks. Use collimation plane method.
- (d) State features of digital level.
- (e) Differentiate between W.C.B. and R.B.

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

- (a) The following bearings were taken in closed compass traverse survey. Determine the correct bearings. Find stations affected by local attraction.

Line	FB	BB
AB	48° 25'	230° 0'
BC	177° 45'	356° 0'
CD	104° 15'	284° 55'
DE	165° 15'	345° 15'
EA	259° 30'	79° 0'

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- (b) The following angles were measured in running a closed traverse ABCDEA. $\angle A = 87^\circ 50' 20''$, $\angle B = 114^\circ 55' 40''$, $\angle C = 94^\circ 38' 50''$, $\angle D = 129^\circ 40' 40''$ and $\angle E = 112^\circ 54' 30''$. If the bearing of line AB is $221^\circ 18' 40''$, calculate the bearings of remaining lines.
- (c) State characteristics of contour lines with neat sketch.

6. Attempt any TWO of the following :

$2 \times 6 = 12$

- (a) A traverse survey was conducted and following data is received, find missing length and bearing of line ST :

Line	Length (m)	Bearing
PQ	154.80	$78^\circ 30'$
QR	174.00	$155^\circ 35'$
RS	238.50	$248^\circ 42'$
ST	?	?

- (b) The following readings were recorded with a dumpy level and a 4 m staff : 2.500, 2.815, 3.100, 0.845, 2.720, 2.955, 3.150, 0.675, 1.405 and 1.840. The level was shifted after the third and seventh reading. The first reading was taken on BM having RL = 100.00 m. Calculate the RLs of the stations by Rise and Fall method. Perform usual checks.
- (c) State merits and demerits of plane table survey.
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