Q.P. Code: 27304

3 Hours **80 Marks**

Q 1 is compulsory. Attempt **any three** questions from the remaining questions**.**

Q.1 Write the principles and applications of : **(20)**

a) Surveying. b) Tacheometry. c) Leveling. d) Plane table surveying.

Q.2 **(20)**

a The following readings are a page of an old level book. The readings in the book were written with pencil & some of these got erased. The same are marked with question marks. Fill up the missing quantities showing the calculation & apply the usual checks. 08

Station	B.S	I.S	F.S	Rise	Fall	RL	Remarks
1	?					150.000	BM
2		2.457			0.827	?	
3		2.400		0.057		?	
4	2.697		?		?	148.07	TP
5	?		2.051	0.646		148.716	TP
6		2.500		1.068		148.784	
7		2.896			?	149.388	
8		?			0.124	?	
9			2.672	0.348		149.612	

b Describe procedure and application of reciprocal leveling. 06

c Point out the difference between **any three** from following: 06

1) GTS bench mark & Permanent bench mark. 2) Leveling staff & Open cross staff.
3) Surveyors Compass & Prismatic Compass 4) Base line and Tie line.

Q.3 **(20)**

a List accessories required for Plane Table Survey and explain traversing method with its suitability. 07

c Define Contour. State engineering applications of Contour maps. 06

d A big pond obstructs chain line PQ. Line PL was measured as 901m on left of the line PQ for circumventing the obstacle. Similarly line PM was measured as 1100m on right of line PQ such that points L-Q-M are in the same straight line. Lengths of QL and QM are 502m and 548m respectively. Find distance PQ. 07

Q.4 **(20)**

a The following bearings were taken for a closed compass traverse in survey project: 10

Line	AB	BC	CD	DE	EA
FB	$48^{O}25'$	$177^{O}45'$	$104^{O}15'$	$165^{O}15'$	$259^{O}30'$
B B	$230^{O}0'$	$356^{O}0'$	$284^{O}55'$	$345^{O}15'$	$79^{O}0'$

State which stations are affected by local attraction and determine correct bearings. Further, calculate the true bearings, if the declination was $1^{O}30'$ W.

Q.P. Code: 27304

Q.4

b Write short note on **any two** from following: 10

i. Magnetic declination and its effects.

ii. Prismatic compass with its uses & advantages.

iii. Indirect ranging (procedure and sketch)

Q.5 **(20)**

a A tacheometer fitted with an analytical lens is set up at an intermediate point on a traverse course PQ & following observations are made on a vertically held staff: 10

Instrument station	Staff Station	Bearing	Staff intercept	Vertical Angle	Axial hair Readings	Remarks
O	P	130°	3.550	+8° 45' 0"	2.195	R L of P is 321.50m
	Q	220°	2.055	+6° 30' 0"	1.685	

Find distance and gradient between stations P and Q.

b Describe in detail procedure of taking bearing of a line with theodolite. 05

c Explain in detail the use of theodolite as a level. 05

Q.6 **(20)**

a For a closed traverse ABCD, due to some obstructions, it was not possible to observe bearings of lines BC & CD. Calculate missing bearings. 07

Line	AB	BC	CD	DA
Length in metres	500	1200	880	1050
WCB	60°	?	?	310°

b A 20 m chain was found to be 4 cm too long after chaining 1400 m.It was 8 cm too long at the end of day's work after chaining a total distance of 2420 m.If the chain was correct before commencement of the work, find the true distance. 05

c Write short note on **any two** from the following: 08

1) Trapezoidal and parabolic rule for area calculation.
2) Gale's Traverse Table.
3) Different axes of a theodolite and their interrelationships.
