Faculty of Engineering & Technology
Fourth Semester B.E. (Civil Engg.)/Second Semester B.E.P.T. (Civil Engg.) Examination
SURVEYING – I
Sections—A & B

Time—Three Hours] [Maximum Marks—80

INSTRUCTIONS TO CANDIDATES

(1) All questions carry marks as indicated.

(2) Answer **THREE** questions from Section A and **THREE** questions from Section B.

(3) Due credit will be given to neatness and adequate dimensions.

(4) Assume suitable data wherever necessary.

(5) Illustrate your answers wherever necessary with the help of neat sketches.

SECTION—A

1. (a) Differentiate between Prismatic and Surveyor's Compass. 5

(b) A line was measured by 20 m chain which was accurate before starting the day's work. After chaining 950 m, the chain was found to be 8 cm too long. After chaining a total distance of 1600 m, the chain was found to be 15 cm too long. Find the true length of measured length. 8

2. (a) What is Ranging ? What are the methods of ranging a survey line ? 6

(b) Following are the bearing observed at the stations A, B, C, D of a closed traverse ABCD carried out with the help of a prismatic compass :

Line	Observed bearing	
	F.B.	B.B
A B	74° 30′	256° 10′
B C	107° 30′	286° 30′
C D	225° 10′	45° 10′
D A	306° 50′	126° 10′

Correct the observed bearing for the local attraction and calculate the included angles. 7

3. (a) Derive an expression for curvature and refraction correction in levelling. 6

(b) The following readings were taken with a level in sequence 2.315, 1.615, 1.805, 1.115, 2.345, 1.345, 2.105, 1.305 and 1.050. The level was shifted after the third and sixth readings. The fifth reading was taken at station whose elevation is 90 m. Find the reduced levels of the remaining points, using plane of collimation method with usual check. 8

4. (a) Explain what is meant by the sensitiveness of a level tube. Describe how you would determine in the field the sensitiveness of a level tube attached to dumpy level. 7

(b) An observer is standing on deck of ship to just see the top of lighthouse. The height of lighthouse is 45 m above sea level and observer's eye level is 6 m above sea level. Determine the horizontal distance between observer and lighthouse. 6

5. Write short notes on any **THREE** :

(i) Temporary adjustment of dumpy level 4

(ii) Reciprocal levelling 5

(iii) Interpolation of contours 4

(iv) Use of optical square. 4

SECTION—B

6. (a) What are the different fundamental axes of a theodolite and list out the relation between them. 6

(b) A traverse is run to set out a line MQ= 1900 m at right angles to a given line MN. The lengths and bearings observed are as follows :

Line	Length (m)	Bearings
MN	–	360° 00′
MO	850	120° 00′
OP	1000	86° 36′
PQ	?	?

Calculate length and bearing of line PQ. 7

7. (a) Explain consecutive and independent co-ordinates. 7

(b) Describe the temporary adjustment of theodolite. 6

8. (a) Explain three point problem of Plane Table Surveying. 7

(b) Define orientation of Plane Table Surveying and describe the backsight orientation of plane table. 6

9. (a) Calculate the quantity of earth work in cubic meters required for road embankment from the following data :

Formation width = 9 m

Side slopes = 2:1

Distance in m	**Height of bank in m**	**Side slope of the original ground**
0	3.0	1 in 10
30	3.6	1 in 8
60	3.8	1 in 12

7

(b) Explain the operation of transferring the alignment from the surface to the bottom of shaft. 7

10. Write short notes on any **THREE** :

(i) Abney level 5

(ii) Box sextant 4

(iii) Optical theodolite 4

(iv) Planimeter. 4