B.E. Civil Engineering Fourth Semester

CE-405 - Surveying & Levelling-I

P. Pages : 3 **GUG/W/18/1537**

Time : Three Hours * 1 2 1 1 * Max. Marks : 80

Notes : 1. All questions carry equal marks.
2. Answer **all** questions.
3. Due credit will be given to neatness and adequate dimensions.
4. Assume suitable data wherever necessary.
5. Retain the construction lines.
6. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) A river is flowing from west to east for determining the width of river two point A and B are selected on the southern bank such that distance AB = 100M point A is west words. The bearings at a free C on the northern bank are observed to be 40º and 340º, respectively from A & B calculate the width of the river. **8**

b) A tape 20 m long of standard length at 84ºF was used to measure a line the mean temperature during measurement being 65º. The measured distance was 882.10 meter following being the scope 2º10' - 100M, 4º12' for 150 M 1º6'-50 M, 7º48' for 200 M, 3º-0' for 300 M 5º10' - 82.10 M find the true length of the line if the coefficient, of expansion is 65×10^{-7} per 1ºF. **8**

OR

2. a) The following are bearings taken on a closed compass traverse. **8**

Line	Fore Bearing	Back Bearing
AB	82º 10'	259º 0'
BC	120º 20'	301º 50'
CD	170º 50'	350º 50'
DE	230º 10'	49º 30'
EA	310º 20'	130º 15'

Compute the interior angle and correct them for observational error assumed the observed bearing of line CD to be correct adjust the bearing of the remaining sides.

b) State difference between surveyor compass and Prismatic compass. **4**

c) Define : **4**
i) Magnetic Declination. ii) Local Attraction.

3. a) Draw neat sketch of Dumpy level and locate all the parts. **4**

b) The following consecutive readings were taken with a level and 3 meter levelling staff on continuously sloping ground at a common interval of 20 meter **8**
0.602, 1.234, 1.860, 2.574, 0.238, 0.914, 1.936, 2.872, 0.568, 1.824, 2.722
the reduced level of the first point was 192.122, Rule out a page of a level field book and enter the above readings. Calculate the reduce level of the point and also the gradient of the line joining the first and last point.

c) State and explain method of spirit levelling. **4**

OR

4. a) State and explain temporary adjustment of a level in detail. **8**

b) Explain sensitivity of bubble tube and derive equation of sensitivity of bubble tube. **8**

5. a) Draw neat sketch of transit theodolite and name all the parts. **4**

b) For the following traverse, compute length of line CD so that A, D and E may be in one straight line. **12**

Line	Length	Bearing
AB	110	83º 12'
BC	165	30º 42'
CD	?	346º 06'
DE	212	16º 18'

OR

6. a) State and explain temporary and permanent adjustment of transit theodolite. **7**

b) The following measurements were made in a closed traverse ABCD, AB = 97.54 M, CD 170.69 M, AD 248.47 M ∠DAB - 70º45' ∠ADC 39º15'. **9**
Calculate missing measurement.

7. a) 30 m length of earthwork volume for a proposed road has a constant gross section of cut and fill, in which cut area in equal to fill area. The level formation is 10 m wide the transverse ground slope is 20º and side slope in cut is 0.5H:1V Calculate the volume of excavation in 30 m length. **9**

b) Explain the procedure to determine the tachometric constant by fixed hair method. **4**

c) Explain briefly the construction of subtense bar. **3**

OR

8. a) Define contour and discuss in detail the method of direct and indirect contouring. **8**

b) The area with in contour line at the site of reservoir and the face of proposed dam are as follows. **6**

Contour	Area (m^2)
300	620
302	8400
304	60240
306	90500
308	100, 200
310	301500
312	70300
314	450500
316	527280

Taking 300 m as bottom level of reservoir and 314 as water level. Find the volume of water in reservoir.

c) Define Horizontal equivalent. **2**

9. a) What is simple curve and state procedure for setting out simple curve by linear method. **8**

b) Write a note on : **8**

i) Ghat Tracer.

ii) Sounding.

OR

10. a) A circular curve has 200 m radius and 65º deflection angle what is its degree - **8**
i) By arc definition ii) By chord definition
also calculate length of curve, Tangent length, length of long chord, apex distance and mid ordinate.

b) Write a note on ; **8**

i) Geodimeter.

ii) Box Sextant.

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