4th Semester Back Examination 2017-18
SURVEYING - I
BRANCH : CIVIL, MECH
Time : 3 Hours
Max Marks : 70
Q.CODE : C1176
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.
Answer all parts of a question at a place.

Q1 **Answer the following questions :** **(2 x 10)**
  a) Define ill conditioned triangle.
  b) In optical square, the two mirrors are placed at an angle of -------
  c) *Can you measure an angle of 30^0 20' with help of a prismatic compass.* Justify your answer.
  d) What is the principle of plane table surveying?
  e) Write the principle used to adjust closing error.
  f) Give an example of a level surface.
  g) Reciprocal leveling eliminates the error due to --------------.
  h) Contour lines may intersect at a point in case of a -----
  i) What is the meaning of 100 mm theodolite?
  j) Define transiting of a theodolite.

Q2 **a)** A 30 m long steel tape is supported at the ends. Find the normal tension for the tape with the following data. **(5)**
      Cross section of the tape= 4 mm^2, weight of tape material=0.0786 N/mm^3,E=200 GN/m^2, The pull at which the tape is standardized is 100 N.
  b) During chain survey, a pond came in the way of a chain line, making direct length measurement impossible. Two lines, AC and AD, were set out on either side of the chain line and measured 321.8 m on the left and 228.7 m on the right. The triangle was completed by a straight line CBD, wherein CB measured 124.5 m and BD measured 108.8 m, B being on the continuation of the chain line. Calculate the length AB. **(5)**

Q3 **a)** Discuss common errors in plane table survey. **(5)**
  b) How permanent adjustment is done in dumpy level? **(5)**

Q4 **a)** Whole circle bearings of the lines of a traverse ABCDA are given below. Find the interior angles at A, B, C and D. **(5)**

Line	AB	BC	CD	DA
Bearing	70^0 30'	120^0 45'	2230^0 30'	320^0 47'

  b) Derive the equation for correction of curvature. **(5)**

Q5 **a)** To calculate the sensitivity of a bubble tube, the following observations were made on a staff held at 50 m from the level. **(5)**
      Reading at the left end bubble =20, Reading at the right end bubble =10, staff reading =1.865 m,
      Reading at the left end bubble =10, Reading at the right end bubble =20, staff reading =1.785 m. Calculate the sensitivity and radius of curvature of the bubble tube.

b) Explain indirect method of contouring **(5)**

Q6 **a)** Explain method of reiteration for measuring horizontal angle. **(5)**
b) Describe the odolite traversing. **(5)**

Q7 The page of an old field book is shown below. Some readings are not clear. **(10)**
Calculate these readings from the available data and do usual checks.
Considering distance between two staff point is 30 m, calculate the gradient
between A and F.

Staff Point	B.S.	I.S.	F.S.	Height of Collimation	R.L.	Remarks
A					100.91	
B		1.085				
C		2.125				BM RL 100
D	1.315				101.26	
E			1.325	102.235		
F					101.61	

Q8 **Write short answer on any TWO :** **(5 x 2)**
a) Use of theodolite
b) Reciprocal levelling
c) Plane table surveying by Resection method
d) Elimination of errors in Chain surveying