Student Exam No._____

GANPAT UNIVERSITY

B. Tech. Semester: 6th Civil Engineering

Regular Examination April - June 2015

2CI602 ADVANCED SURVEYING

Time: 3 Hours **Total Marks: 70**

Instruction: 1 All Questions are Compulsory.
2 Figure to the Right indicates Full Marks
3 Assume Suitable Data if necessary.

Section - I

Q1 **(A)** What are the different methods employed in tacheometric survey? Describe the method most commonly used. 6

(B) Explain theory of triangulation system with net sketch. 6

OR

Q1 **(A)** Derive the Distance and Elevation formula for Staff Vertical (inclined sight) and Normal. 6

(B) Definition: Base line, Triangulation figure. 6

Q2 **(A)** Two sets of tachcometric readings were taken from an instrument station A, the reduced level of which was 101.06 m to a staff station B.

(a) Instrument P K=100, C=0.06 m, Staff held vertical

(b) Instrument Q – K=90, C=0.06 m, Staff held normal to the line of sight.

Instrument	At	To	Ht. of Inst.	Vertical angle	Staff Readings (m)
P	A	B	1.52	3 0°	0.755, 1.005,1.255
Q	A	B	1.55	3 0°	?

What should be the stadia readings with instrument Q? 6

(B) Explain "Classification of Triangulation System" 5

OR

Q2 **(A)** A tacheometer was set up at station A and the following readings were obtained on a vertically held staff:

Station	Staff Station	Vertical Angle	Hair Readings	Remarks
A	B.M.	-2°18'	3.255, 3.550, 3.875	RL of BM = 437.655 m
	B	+8°36'	1.650, 2.515, 3.380	

Calculate the horizontal distance from A to B and the RL of B, if the constants of the instrument were 100 and 0.4 6

(B) The angles of a triangle ABC were recorded as follows :

Angle	Degree(°)	Minute(')	Second(")	Weight
A	77	14	20	4
B	49	40	35	3
C	53	4	52	2

Give the corrected values of the angles. 5

Q3 (A) The stadia intercept read by means of a fixed hair instrument on a vertically held staff is 1.15 m. the angle of elevation being 6°36'. The instrument constants are 100 and 0.4. what would be the total nos. of turns registered on a movable hair instrument at the same station for a 1.85 m intercept on a staff held on the same point, the vertical angle in this case being 6°24' and the constants 1000 and 0.6 6

(B) The following angles were measured at a station of so as to close the horizon. 6

Angle	Degree(^{0})	Minute(')	Second(")	Weight
AOB	83	42	28.75	3
BOC	102	15	43.26	2
COD	94	38	27.22	4
DOA	79	23	23.77	2

Adjust the angles.

Section – II

Q4 (A) A surveyor carried out leveling operations of a closed circuit ABCDA starting from A and found that 6
B was 6.71 meter above A
C was 5.59 meters above B
D was 3.48 meters above C
D was 13.72 meters above A
The accuracy of all the four leveling operations is to be assumed equal. Determine the probable heights of B, C and D above A by the method of Correlates.

(B) The local mean time at a place in longitude $69^0 30'$E is $8^h\ 20^m\ 16^s$. Find the standard time if the place is in India. 3

(C) What is the difference between map and mosaic in photogrammetry? 3

OR

Q4 (A) Find the most probable values of angle A, B and from the following observations. 6

Angle	Degree(^{0})	Minute(')	Second(")	Weight
A	45	26	48.5	2
B	52	43	24.5	3
C	48	34	22.5	1
A+B	98	10	12.5	1
B+C	101	17	47.5	1

(B) Find the G.M.T. corresponding to the local mean time of $11^h\ 10^m\ 25^s$ a.m. at places having longitude on 48^0 36' E. 3

(C) What is the difference between distortion and displacement in photogrammetry? 3

Q5 (A) A photographic survey was carried out at a flying height of 4500m. focal length of the camera lens 15cm, the photographic plate size was 23 cm×23cm and the overlap along the direction of flight was 61%. Calculate the error in height measurement for an error of 0.1mm in the parallax measurement. 6

(B) Define the following term: a) Hour angle b) right ascension c) solstice 5

OR

Q5 (A) The base position of a 850m high mountain is at 9cm from the flight line on a flight map. If the flying altitude is 5600m above the datum. Calculate the relief displacement of the image of the peak and its distance from the edge of the photograph, given that the size of the print is 22.5 cm × 22.5 cm. 6

(B) Write a short note on following terms with clean and neat sketch. 5
a) star at culmination b) declination

Q6 (A) What is Remote Sensing? Explain Mie scattering? 4

(B) What do you mean by GIS? Elaborate types of data in which GIS technology utilizes it. 4

(C) Explain eccentricity of the orbit in equation of time. 4

END OF PAPER