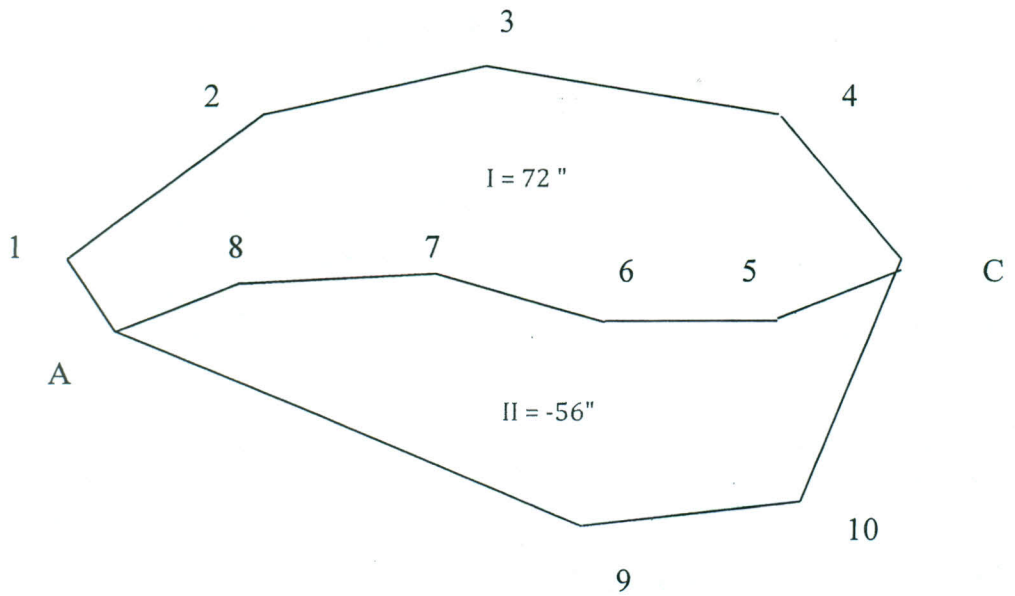
Mansoura University of Engineering
Faculty of Engineering
Course Name :(Surveying 2)
Course Code : (PWE. 8214)
Date of Exam : 29/12/2010

1 st	Semester Academic Year 2010/2011
Time Allowed : (3) Hours	
Level: (2nd)	
Department : (Civil – Public works)	

الفرقة الثانية مدنى (تخلفات)

Answer all questions and please illustrate your answer with figures. **Max. Grids 80 degrees**

Q1	Idea (30) %	Steps (30)%	Calculations (30)%	Final Result (10)%	Marks(20)



Q 1-a) Calculate the correction of each horizontal angle of the above traverse? (15 pts)

Q 1- b) what are the Meridian radius of curvature (M) & Prime vertical radius (ρ)? What is the Difference between Normal & vertical lines? (5 pts)

Q2	Idea (30) %	Steps (30)%	Calculations (10)%	Final Result (30)%	Marks(20)

Q 2-a) Calculate the Cartesian coordinates of A and B. - Geodetic distance AB. - Azimuth of line AB.

Point	Φ	λ	h
A	28 ° 25' 30"	30 ° 53' 20'	60.7m
B	28 ° 25' 59"	30 ° 53' 48"	78.0m

The WGS84 ellipsoid parameters are:
Semi- Major Axis (a) = 6378137 meters
Semi- Minor Axis (b) = 6356752.3142 meters (10 pts)

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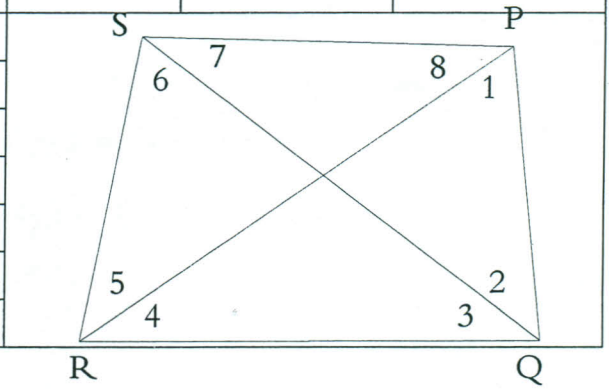
Second examiner: Dr. Abd El-Menam Baker

Q2-b) Compute the adjusted angles of the observed angles in the shown figures by using equal shifts adjustment method. (10 pts)

Angle	Observed value	Station	Coordinates	
			E	N
1	30o 20' 50"	P	1885.82	1632.47
2	54 10 45	Q	1401.00	1045.76
3	55 44 38			
4	39 43 39			
5	41 53 49			
6	42 37 47			
7	54 54 56			
8	40 33 30			
Σ	359 59 54			



Q3	Idea (30) %	Steps (30)%	Calculations (10)%	Final Result (30)%	Marks(15)

Q 3-a) A Roadway curve between two lines is to have a radius of 800 m. The tangents intersect at a chainage of 2550 m and angle of deflection is 40o. Find the tangent length, External and internal distances, length of the curve, chainage of the apex and end of the curve. (10 pts)

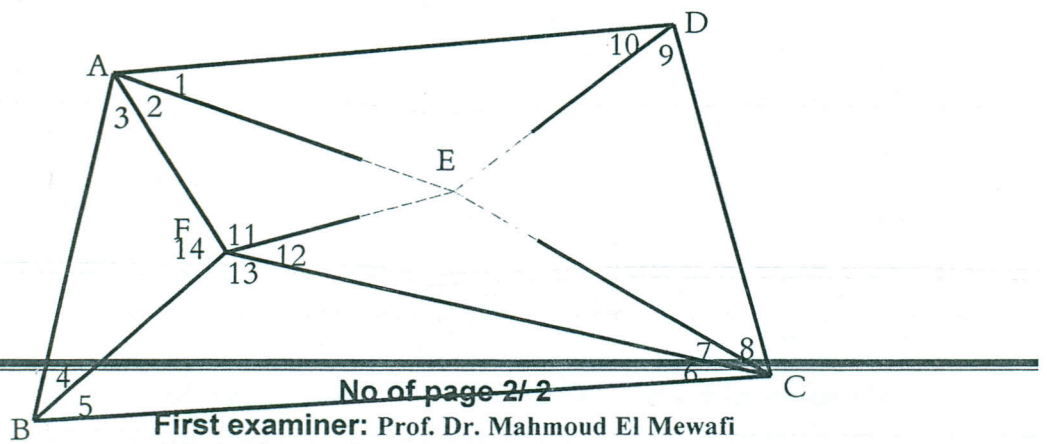
Q 3.b) A -2% gradient joins a 3.5% gradient. A vertical parabolic curve 200 m long is to be introduced between the two grades. Calculate the relative level of beginning, the lowest, (10 pts)

Q4	Idea (30) %	Steps (30)%	Calculations (10)%	Final Result (30)%	Marks(20)

Q4-a) **Give a short notes on the following:**

a) Intersection & Resection
b) Control survey & detail Survey
c) Meridian radius of curvature (M) & Prime vertical radius (ρ).
d) Geoid undulation & Deflection of the vertical (10 pts)

Q 4-b) In the following figures determine the number and type of the condition equations, and write down only one equation of each type. (10 pts)



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