


<b>Menofia University</b> <b>Faculty of Engineering, Shebin El-Kom</b> <b>Civil Engineering Department</b> <b>Second Semester Exam, 2014-2015</b> <b>Date of Exam: 11 / 1 / 2015</b>		<b>Subject : Physical geodesy</b> <b>Code: CVE537</b> <b>Year : Public Works Diploma course</b> <b>Time Allowed : Three hours</b> <b>Total Marks : 100 marks</b>
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Try all Questions (Use clear sketches)

[Marks]

Data:  $\gamma_0 = 980.61992 \text{ cm / s}^2$

**Question ( 1 )**

[20]

**Explain:**

- the basic features of level surfaces and plumb lines
- the geoid, geopotential number, dynamic height and orthometric height
- the effect of non-parallel level surfaces on spirit leveling
- the dynamic correction
- the orthometric correction

**Question ( 2 )**

[20]

The water levels of two separate lakes have geopotential numbers of 11.13 and 28.78  $\text{m}^2/\text{s}^2$ . Which lake has the higher water surface? Compute the dynamic height of both water levels.

**Question ( 3 )**

[20]

Assume that the potential  $W_0$  on the geoid is 62 636 855.73  $\text{m}^2/\text{s}^2$ . If the values of the potential at three points C, D and E are 62 636 507.18, 62 636 635.97 and 62 636 995.11  $\text{m}^2/\text{s}^2$ , respectively. In addition, the gravity acceleration  $g$  was observed at these points and found to be 981.55122, 979.66371 and 982.77731  $\text{cm / s}^2$ , respectively. Compute the dynamic and orthometric heights for these points.

**Question ( 4 )**

[20]

Consider two terrain points A and B, which have dynamic heights of 108.136 and 277.607 m, respectively. Compute the orthometric height difference between the two points, if the gravity accelerations at the two stations are 981.007745 and 979.990056  $\text{cm / s}^2$ , respectively.

**Question ( 5 )**

[20]

The GPS geodetic heights of stations A & B are 64.567 m and 82.308 m; and their elevations are 52.106 m and 70.315 m, respectively. Compute the geoid undulation of at both stations.

*With best wishes*

This exam measures the following ILOs

Question Number	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
skills	dk-1-1	dk-1-2	dk-1-1	dk-1-2	dk-1-2	di-2-1	di-2-1	di-2-1	di-2-1	di-2-1	dp-1-1	dp-1-1	dp-1-1	dp-1-1	dp-1-1
	Knowledge & Understanding Skills					Intellectual Skills					Professional Skills				