THE HONG KONG POLYTECHNIC UNIVERSITY

DEPARTMENT OF LAND SURVEYING AND GEO-INFORMATICS

Programme	:	04001 MSc/PgD in Geomatics			
Subject Title	:	Satellite Positioning and Navigation Systems			
Subject Code	:	LSGI533	**Session**	:	Semester 2, 2005/06
Date	:	15 May 2006	**Time**	:	18:30 - 21:30
Time Allowed	:	3 hours	**Subject Examiner(s)**	:	Dr. Wu Chen (LSGI)

This question paper has a total of __2__ pages.

Instructions to Candidates : This paper has **SIX** questions.

Answer any **FIVE** questions.

All questions carry equal marks.

Total marks = 100.

Available from Invigilator : Nil

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Question 1

Briefly describe the following concepts (select any **Four** from the given five).

a) Geodetic Datum (5 marks)

b) DGPS (5 marks)

c) Ambiguity Resolution (5 marks)

d) INS (5 marks)

e) Map Matching (5 marks)

Question 2

Describe the positioning principle of the Global Positioning System (GPS). Compare the major differences between GPS and the European Galileo System. (20 marks)

Question 3

Explain the working principle of WADGPS. How does the WAAS system provide ionospheric delay corrections for single frequency users? (20 marks)

Question 4

Explain the positioning principle with the TDOA method using a mobile phone network. Discuss the main factors that affect positioning accuracy of this method. (20 marks)

Question 5

a) What are major errors affecting the positioning accuracy of a DR system and how can you improve the performance of a DR system? (13 marks)

b) Given a start point (E = 56000 m, N = 49000 m) and initial bearing of 135 degrees at time t_0, a measured angle change rate of 5 degrees/s and odometer output 8 m/s, calculate the position coordinate after 5 seconds. (7 marks)

Question 6

You are required to design a system that can be used to track staff (total 50) in a warehouse within an area of 100 m x 200 m, to an accuracy of 5 m. You should provide the principles of positioning, system design, achievable accuracy, and possible limitations of your system. (20 marks)

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