



**DEPARTMENT OF SURVEYING AND GEOINFORMATICS**  
**SCHOOL OF ENVIRONMENTAL TECHNOLOGY**  
**FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA**

COURSE: Hydrographic Surveying I

COURSE CODE: SVG713

SESSION: 2019/2020

Time Allowed:  $2\frac{1}{2}$  hours.

**Instruction:** Answer all questions

**QUESTION 1**

1a) Discuss extensively (giving at least three examples under each category), the various methods/systems available for position fixing afloat. (16Mks)

1b) Discuss extensively on "Remote sensing for bathymetric operations" (9Mks)

**QUESTION 2**

2(a) Identify the various bathymetric equipment that utilize under-water acoustics for depth measurement and wreck determination; and explain the principle of operation of any two (2) among them (11Mks)

2(b) Identify the sources of errors in echo sounding giving two (2) examples of each source where applicable (8mks)

2(c) Discuss the following:

(i) Bar check (ii) Interlines (iii) Cross lines (6Mks)

**QUESTION 3**

3(a) Using a well labeled diagram that shows the relationship of the following tidal datum with ocean zones, define the following tidal terminologies:

(i) MLW (ii) LAT (iii) MHW (iv) High water diurnal inequality (v) tidal current (15Mks)

3(b) Explain briefly what you understand by Singlebeam and Multibeam Echo Sounders stating clearly the advantage of one over the other. (10Mks)

**QUESTION 4**

4(a) The hourly tidal observations on the 19th of January 2021 at Apapa tide station are as follows:

Time	Depth	Time	Depth	Time	Depth
00:00:00	2.031	08:00:00	1.294	16:00:00	1.774
01:00:00	2.111	09:00:00	1.362	17:00:00	1.663
02:00:00	2.111	10:00:00	1.468	18:00:00	1.514
03:00:00	2.008	11:00:00	1.593	19:00:00	1.398
04:00:00	1.855	12:00:00	1.727	20:00:00	1.377
05:00:00	1.65	13:00:00	1.837	21:00:00	1.45
06:00:00	1.425	14:00:00	1.908	22:00:00	1.635
07:00:00	1.323	15:00:00	1.893	23:00:00	1.758

(i) What kind of tide does the river exhibit (6Mks)

(ii) Calculate the MLW, MHW, diurnal High and Low water inequalities (10Mks)

4(b) Explain in sequential order, how to determine the catchment area of a stream using ArcGIS or QGIS software. (9Mks)

Good luck