



ELIZADE UNIVERSITY

ILARA-MOKIN

ONDO STATE

FACULTY: Basic and Applied Sciences
DEPARTMENT: Physical and Chemical Sciences
FIRST SEMESTER EXAMINATIONS
2018/2019 ACADEMIC SESSION

COURSE CODE: AGP 419

COURSE TITLE: GEOPHYSICAL TIME SERIES ANALYSIS

DURATION: 2 Hours

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HOD's SIGNATURE

TOTAL MARKS: 60 MARKS

Matriculation Number: _____

INSTRUCTIONS:

1. Write your matriculation number in the space provided above and also on the cover page of the exam booklet.
2. This question paper consists of 2 pages including this page.
3. Attempt Question 1 and any other three questions.

1 For a set of signals with inputs 50 Hz, 100 Hz, 200 Hz and 300 Hz sampled at 2 msec, 4 msec and 8 msec. Determine for each input (i) Output (ii) Maximum recoverable frequency and (iii) Alias

15 Marks

2 (a) Consider a filter with impulse response (2, -1, 1, 3, -2), evaluate the system using geometric operation of sliding assuming input (1, -1). Use graph to explain the convolution operation.

(b) List three conditions that could cause incorrect reconstruction of analog signal and describe how you can solve the problem.

15 Marks

3 (a) The earth is a filter. Explain using diagram(s).

(b) Using z - Transform, finds the following convolution: (2, -1)* (4, 3, 2, 1)

15 Marks

4 (a) Write briefly on the following:

- i. Band-pass filter
- ii. Dynamic range
- iii. Impulse response

(b) Describe the effect of time shift on the phase and symmetry of a typical wavelet

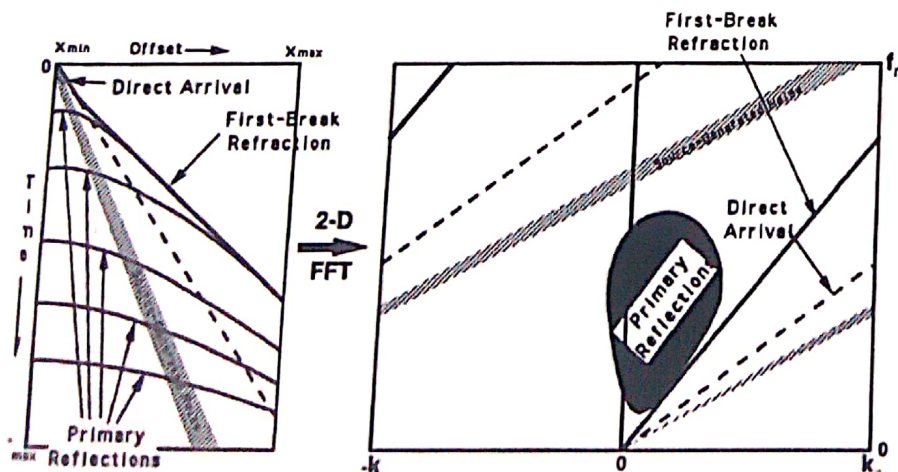
15 Marks

5 (a) Given the wavelets (1, -1, 1, -1) and (1, 2, 3, 4), find the autocorrelation of each wavelet and their cross – correlation.

(b) Show by means of illustrations the effect of sampling interval on the reconstruction of an analog signal.

15 Marks

6 (a) Use the figure below to explain how F-K Transform aid seismic signal - to -noise ratio



(b) Explain using an appropriate diagram the term “Fourier Transform”

15 Marks