UNAM
UNIVERSITY OF NAMIBIA

FACULTY	Agriculture, Engineering and Natural Sciences		
DEPARTMENT	Geosciences		
SUBJECT	SEISMIC TECHNIQUES AND METHODS		
SUBJECT CODE	S6921GS		
PAPER	Paper 1 Combined		
DATE	JUNE 2026		
DURATION	180 min (3 hours)	**MARKS**	100

FIRST OPPORTUNITY EXAMINATION

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This question paper consists of 3 pages (including this one)

Instructions

Closed book examination
Answer all questions.
Use a calculator where necessary
Recommendation: read first all subordinate questions before you answer.

Question 1

(a) Explain, with the aid of examples, the difference between active and passive geophysical methods. [5 marks]

(b) Explain principle of operation and architecture of a geophone as used in onshore seismic data acquisition [5 marks]

Question 2

Compare and contrast the geometrical properties of the Common midpoint (CMP) gather and the Common Receiver Gather (CRG) [10 marks]

Question 3

Describe the typical data gathering stages involved in acquisition in offshore exploration [10 marks]

Question 4

State and explain the various corrections that are carried out on the field recorded seismic data [10 marks]

Question 5

What do you understand by seismic migration? Support your answer with an illustration. [10 marks]

Question 6

(a) Explain the scale for seismic data and stratigraphy hierarchy [5 marks]

(b) Explain the following terms as applied to wavelet analysis in seismic interpretation.

(i) Acoustic impedance and Reflection coefficient [5 marks]

(ii) Minimum and Zero phase pulse [5 marks]

Question 7

(a) In a land seismic survey project, a series of seismic waves were generated at a specified source and sent to the subsurface. Accompanying studies on neighbouring rock parameters at the vicinity indicated that the waves penetrated two major layers of different properties. The top layer had a rock mass of 3600gm and an estimated volume of 2000cc and the seismic waves travelled at a velocity of 2300m/s. The lower layer had an estimated density of 1.7gm/cc and the seismic waves penetrated this layer at a velocity of 2450m/s. (*NB:* $\rho=m/v$).

i. Calculate the Reflection coefficient? [5 marks].

ii. How much of the energy was reflected at the interface of the two layers? [5 marks]

(b) Explain the importance of a well to seismic tie. [5 marks]

(c) Explain seismic sequence and how would one recognize a seismic sequence on a given seismic section [10 marks]

Question 8

As a seismic stratigrapher, outline the systematic procedure you would implore in interpreting the environment of deposition (EOD) from a given seismic data set.

[10 marks]

END OF EXAM