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**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA**

**FACULTY OF SCIENCES**

**DEPARTMENT OF PURE AND APPLIED SCIENCES**

**JULY 2018 EXAMINATIONS**

**COURSE CODE: PHY 361**

**COURSE TITLE: GEOPHYSICS II**

**CREDIT UNIT 2**

**TIME ALLOWED (2 HRS)**

**INSTRUCTION: *Answer question one (1) and any other three (3) questions***

**QUESTION 1**

1**(ai)** (i) What is seismic reflection? (2 Marks)

ii) What do you understand by the term acoustic impedance of a rock? (2 Marks)

(iii) Explain the following with the aid of diagram: (a) Multiple reflections (3Marks)

(b) Simple multiple (3 Marks) (c) Peg leg (3 Marks)

(d) Intra-formational multiples (3 Marks)

**(aii)** Briefly explain the following types of waves: (a). Primary wave (3 Marks)

(b). Shear wave (3 Marks) (c). Love wave (3 Marks)

**QUESTION 2**

2.a) With the aid of a simple diagram explain the following concept in seismic

theory/ seismometer.

(i) reflection (2½ Marks) (ii)refraction (2½ Marks)

(iii) Head waves (2½ Marks) (iv) Moving coil geophone (2½ Marks)

b) (i) Give the ratio of impedances Ii to I2 of two rock layers. (2½ Marks)

(ii) A seismic wave is incident normally on a reflector with a reflection coefficient R

of 0.01. What proportion of the incident energy is transmitted? (2½ Marks)

**QUESTION 3**

3.i) Define the following:

1. Seismometers (2 Marks) (**b**)Hydrophones (2 Marks) (**c**) Noise (2 Marks)

(ii )Obtain the velocity of material made up of 90 % of quartz and 10 % of water.

Note that the p-wave velocities in quartz and water are 5200ms-1 and1500ms-1

in that order. (9 Marks)

**QUESTION 4**

Q4a). i. Draw a diagram showing critical refraction at two interfaces.[9 marks]

ii. List 3 equipments use for Seismic Refraction Survey. [3 marks]

b). State Snell’s Law [3 marks]

**QUESTION 5**

Q5a) i. What is Normal Move-Out? **3 marks**

ii. Derive a Move-out equation for a horizontal reflector**4 marks**

b). Write Short notes on the following

i. Picking Refraction Arrivals **4 marks**

ii. Centre Shots **4 marks**