

King Saud University

22/3/1428-29/3/2008

Science College

Student Name :

Geology Department

University Number:

The first laboratory exam of 371GEO(Introduction to geophysics )

Q1) Consider a body of 560 kilograms hooked by a wire with a length of 8 meters and its cutting area is 0.3 square centimeters, if the wire was extended by 0.4 meters then calculate both the stress and the strain and what is the relationship between B and K.

A1)F = m\*a = 9.81\*560 = 5493.5 N

S = F÷A = 5493.5 ÷ (0.3\*10<sup>-4</sup>) = 183116666.67 N/M<sup>2</sup>

ε = ΔL÷L = 0.4÷8 = 0.05

The relationship between B and K is a reverse relationship.

2.5

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Q2) from the next table for a refraction calculate V1,V2,Z:

T(sec)	0	0.05	0.11	0.16	0.19	0.25	0.275	0.30	0.325	0.350	0.375	0.40
X(m)	0	25	50	75	100	125	150	175	200	225	250	300

Slope 1 = (0.2 - 0.1) / (100 - 50) = 0.002, V1 = 1 ÷ slope 1 = 1 ÷ 0.002 = 500 m/s

Slope 2 = (0.375 - 0.325) / (250 - 200) = 0.001, V2 = 1 ÷ slope 1 = 1 ÷ 0.001 = 1000 m/s

Z = (Ti / 2) \* (V1 \* V2) / sqrt(V2^2 - V1^2) = (0.125 / 2) \* (500 \* 1000) / sqrt(1000^2 - 500^2) = 36.08 m

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**Q3)A) Calculate the gravity attraction for a point at 75 degree below the equator.**

$$A3)A)G_{lat}=G_{equator}(1+K_1\sin^2(lat)-K_2\sin^2(2*lat))$$

$$G_{lat}=978031.846(1+0.0053024\sin^2(75)-0.0000059\sin^2(2*75))$$

$$G_{lat}=983038.171$$

**B) Determine the free air correction for a point 200 m above the sea level.**

$$B)FAC = 0.3806 * h = 0.3806 * 200 = 76.12m$$

2.5

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**Q4) Recognize which of the following sentences is true or false by writing in front of it:**

1- Refraction, reflection and gravity attraction are all seismic methods. ( **False** )

2- At the same latitude the gravity at 30 degree east and 45 degree west are the same. ( **True** )

3- The first stage of Hooks law for the material behavior is plastic. ( **False** )

4- usually when we use the refraction and reflection methods we end up with the same amount of thicknesses. ( **False** )

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The Total Marks Earned

10

With my best wishes

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