PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Max Marks: 30 | Max Time: 55 Mins | Weightage: 15 % | **Set A**

TEST 3

II Semester 2016-2017 | Course: **PE A 206 Oil and Gas Exploration** | 19 April 2017

Instructions:

i. Write legibly
ii. Scientific and non-programmable calculators are permitted

Part A

(3 Q x 2 M = 06 Marks)

1. What is the NMO? What is the assumption made after the Taylor series expansion during its derivation?
2. What is interval velocity and average velocity?
3. How is horizontal resolution determined? What is the maximum resolution that we can obtain in seismic survey?

Part B

(4 Q x 4 M = 16 Marks)

4. What will seismic trace recorded at each detector in multi-channel seismic survey over a single horizontal reflector consist of?
5. Draw a neat diagram of single dipping layer reflector and write its travel time equation for reflected wave? Point out why the axis of symmetry is away from zero offset.
6. Mention the disadvantages of using only a shot gather for analysis. Draw a neat figure of CMP gather.
7. Explain the terms elevation statics and weathering statics.

Part C

(1 Q x 08 M = 08 Marks)

8. Consider a horizontal interface between two constant velocity layers. The reflection times are given in the table. Write down the necessary assumptions to be considered in order to calculate the velocity and depth of layers. Also find out the velocity and depth of upper layer for geophone at:
   i. x=200m
   ii. x=400m

Offset(m)	Arrival time(s)	Offset(m)	Arrival time(s)
-600	0.69486	0	0.67568
-560	0.69242	40	0.67576
-520	0.69014	80	0.67602
-480	0.68802	120	0.67645
-440	0.68606	160	0.67706
-400	0.68427	200	0.67783
-360	0.68265	240	0.67878
-320	0.68119	280	0.67990
-280	0.67990	320	0.68119
-240	0.67878	360	0.68265
-200	0.67783	400	0.68427
-160	0.67706	440	0.68606
-120	0.67645	480	0.68802
-80	0.67602	520	0.69014
-40	0.67576	560	0.69242
0	0.67568	600	0.69486

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TEST 2

II Semester 2016-2017 | Course: **PE A 206 Oil and Gas Exploration** | 22 March 2017

Part A

(6 Q x 2 M = 12 Marks)

1. Name two Seismic Land Sources used for Survey?
2. Explain Seismic trace and Seismic section
3. Write mathematical expression for P wave and S wave velocity.
4. Write the Zeoppritz equations for reflection and transmission coefficient.
5. What is acoustic impedance? What do you mean by negative polarity reflection?
6. Define TWT and Shot gather.

Part B

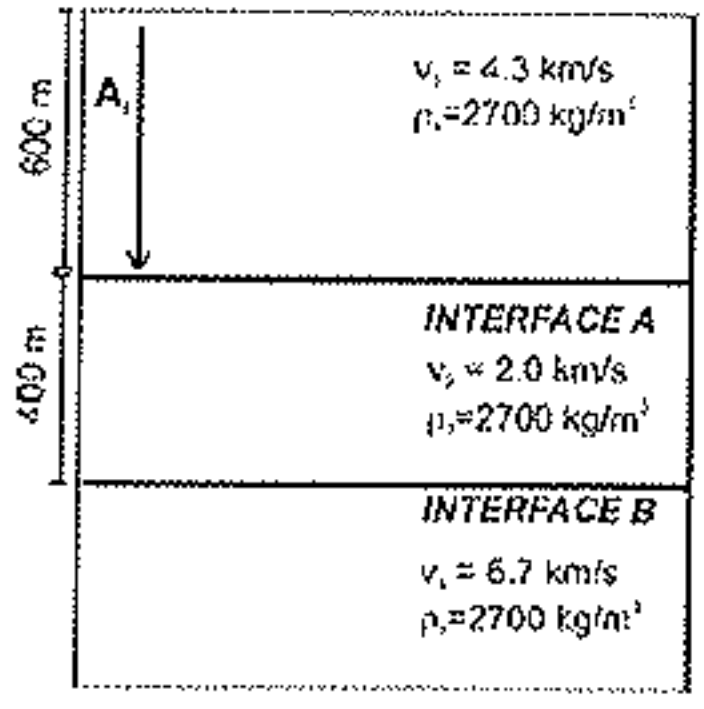
(3 Q x 4 M = 12 Marks)

7. Explain the types of body waves and surface waves with suitable diagram?
8. Explain the factors that affect the seismic wave amplitude?
9. What are seismic detectors? Name the detectors used on land and marine survey.

Part C

(1 Q x 06 M = 06 Marks)

10. Consider a case with a low velocity layer. This could represent a gas-filled layer within high velocity rocks as shown in the figure. What are the first three arrivals (after the direct P wave)? Mark all the arrivals on seismic record with polarity.



PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Max Marks: 30 | Max Time: 55 Mins | Weightage: 15 % | **Set A**

TEST 1

II Semester 2016-2017 | Course: **PE A 206 Oil and Gas Exploration** | 22 February 2017

Instructions:

i. Write legibly.
ii. Scientific and non-programmable calculators are permitted

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Part A

(4 Q x 2 M= 8 Marks)

1. What is aliasing? How to overcome aliasing?
2. What are the key steps in hydrocarbon exploration?
3. Name any 4 types of gravity correction.
4. What is the difference between Regional and Residual anomalies?

Part B

(4Q x 4 M= 16 Marks)

5. Explain types of Remanent magnetization.
6. Explain the difference between Forward and Inverse geophysical problems? Give Suitable Examples.
7. Explain any 2 Magnetometers with suitable diagram?
8. What is convolution? If the digital signal (4,3,2,1) is convolved with ground response which act as filter operator (2,0,3) then what will be the output?

Part C

(1Q x 6 M= 6 Marks)

9. The gravity survey has been conducted at peak of mountain as shown in fig 1. The gravity reading by gravimeter shows g_{obs} =9.71346 m/s^2 (Density of Rock 2.7Mg/cm^3)
   i. Calculate the Free Air Correction (FAC) and Bouguer Correction (BC).
   ii. Calculate latitude correction if latitude is 30^0 of Equator.
   iii. Calculate the Bouguer Anomaly for the survey conducted if terrain correction is 150 gu.

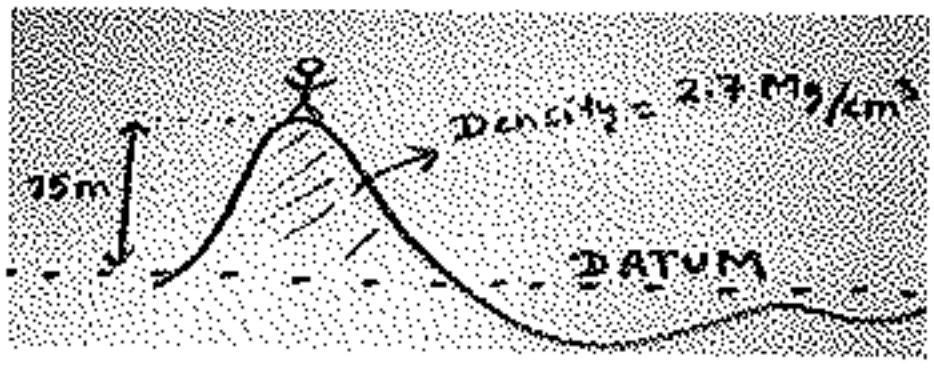

Figure 1