The Open University of Sri Lanka

B.Sc. Degree Programme - Level 05 (2016/17)

PYU3168 – Fundamentals of Geophysics

CLOSE BOOK TEST 1 (NBT 1)

Date: 8th October 2017 Time Allowed: **One Hour (1.00 pm -2.00 pm)**

Registration No.

Answer Both Part A and Part B

Part A – Multiple Choice Questions -For each question there are four suggested answers labelled (a), (b), (c) and (d). When you have selected your answer to a question and underline the answer you have chosen.

(carry 2 marks each 2x20 = 40 marks)

Non-programmable calculators are allowed.

1. Seismic waves are caused by?

   (a) Volcanoes
   (b) Earthquakes
   (c) Thunder
   (d) Tsunami

2. S waves can travel through

   (a) solids but not liquids
   (b) liquids but not solids
   (c) both liquids and solids
   (d) neither liquids or solids

3. Choose the correct statement:

   (a) P waves are slower than S waves
   (b) S waves are slower than P waves
   (c) P waves have the same speed as S waves
   (d) It is not possible to record the speed of S and P waves

4. The S-wave shadow zone is evidence that;

   (a) the outer core is liquid
   (b) the outer core is composed of iron and nickel oxides
   (c) the inner core is solid
   (d) it is very hot near the core

5. Choose the correct statement:

(a) Seismic waves travel faster through less dense material

(b) Seismic waves travel at one speed regardless of the density of the material

(c) It is not possible to record the speed of seismic waves

(d) Seismic waves travel faster through more dense material

6. The elastic rebound theory:

(a) explains folding of rocks

(b) explains the behaviour of seismic waves

(c) explains the origins of earthquakes

(d) Explains the theory of plate tectonics

7. The Richter Scale is used to determine:

(a) intensity of earthquakes

(b) the magnitude of earthquakes

(c) the damage from earthquakes

(d) the number of casualties in an earthquake

8. Analyses of seismograph records cannot provide information on:

(a) the magnitude of the earthquake

(b) the location of the earthquake

(c) the tsunami generated from an earthquake

(d) the depth of the earthquake

9. Among the secondary effects of large earthquakes are:

(a) tsunamis

(b) Fires

(c) landslides

(d) all of these

10. The epicentre of an earth describes the _____.

(a) place of origin of the earthquake inside the earth

(b) point on the fault on which the earthquake occurs

(c) point on the surface of the earth

(d) place at which the earthquake is recorded

Please use the following diagram to answer the questions from 11-13

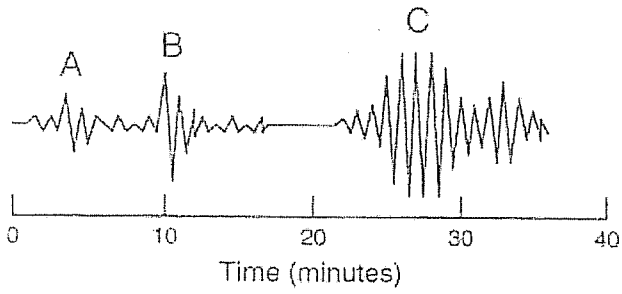
11. What causes the up-and-down wiggles on the seismogram show above?

(a) variations in air pressure

(b) ground vibration

(c) tsunami waves

(d) electromagnetic pulses



12. Which set of waves are probably the surface waves?

(a) A (b) B (c) C (d) A and B

13. The difference in arrival times between which pair of waves can be used to determine the distance to the epicentre?

(a) A and C

(b) A and B

(c) B and C

(d) None of the above

14. A positive gravity anomaly indicates:

(a) an excess of mass

(b) a deficiency in mass

(c) a reversal of gravitational field

(d) none of these

15. Positive gravity anomalies are often associated with;

(a) deep ocean trenches

(b) orebodies beneath Earth's surface

(c) large cavern systems beneath earth's surface

(d) all of these

16. If the distance between two masses is increased by a factor of 3, the gravitational force of attraction between them will

(a) reduce by a factor of 3

(b) reduce by a factor of 9

(c) remain Same

(d) increase by a factor of 3

17. the magnitude of gravity on the earth's surface depends on:

(a) Latitude, elevation and topography

(b) topography and density variations in the subsurface

(c) Latitude, elevation, topography and earth tides

(d) all of above factors

18. Bouguer correction in Gravity prospecting accounts for:

(a) Geoid shape of the earth

(b) Attraction of material between the station and the datum plane

(c) Changes in elevation between stations

(d) Surface irregularities in vicinity of the station

19. The force of gravitation between two bodies in the universe does not depend on

(a) the distance between them

(b) the product of their masses

(c) the sum of their masses

(d) the gravitational constant

20. Bouguer correction in Gravity prospecting accounts for:

(a) Geoid shape of the earth

(b) Attraction of material between the station and the datum plane

(c) Changes in elevation between stations

(d) Surface irregularities in vicinity of the station

Part B – Short Answers - The short answer question can be answered with a few well-written sentences and diagrams in a given space only. ***(12 marks each)***

B1 for each of the application listed below, indicate primary geophysical method that should be used;

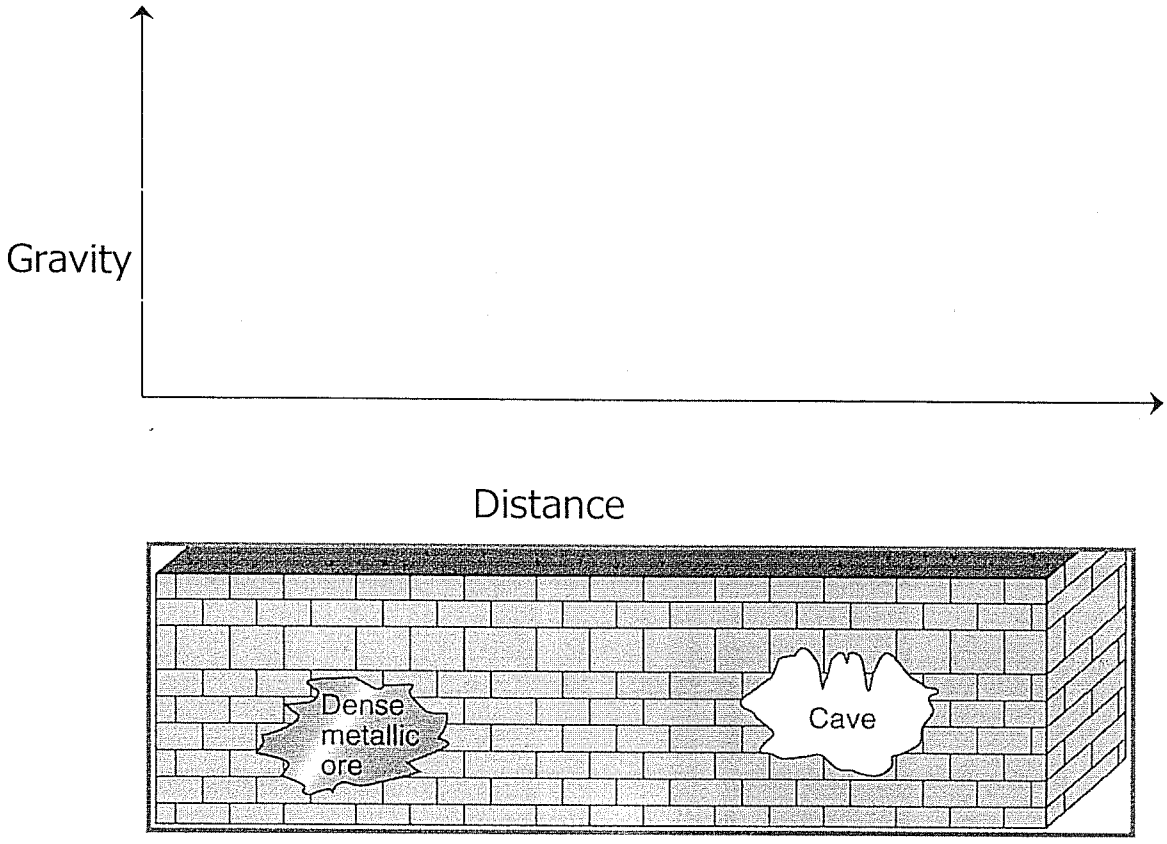
(a) exploration of fresh groundwater .....

(b) imagine the structure of the oil trap .....

(c) iron ore deposit beneath the earth .....

(d) finding the land mine near the subsurface .....

B2 Draw an expected gravity variations to reflect the subsurface variations in the diagram shown below.



B 3 Write down the at least three methods/principles that are used to measure gravity variations in the earth.

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B 4 How do you seismologists locate an earthquake's epicentre? (explain the mathematical explanation, geometrical diagrams as well)

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B 5 Distinguish between the focus and the epicentre of an earthquake.