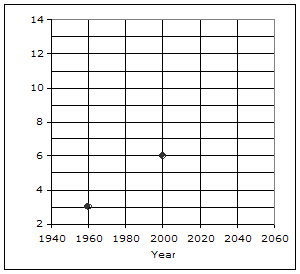
**Chapter 1: Fragile Systems**

|  |  |
| --- | --- |
| **1.** |  |
|  | |  |  | | --- | --- | | Which statement is TRUE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | If the Earth's energy supply were limitless, then population could increase at the present rate forever. |  | | B. | No evidence yet exists of present human population nearing the holding capacity of Earth. |  | | C. | Improved predictions of natural disasters can significantly reduce property losses. |  | | D. | Population growth rate in less-developed countries is less than in more-developed countries. |  | | Student ResponseE. | Either we limit our population growth now, or we savagely compete for scarce resources in the future. | Student Response | | | | Score: | 1/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | Over short-time scales (hours to days) under Earth's surface pressure, which of the following is considered NOT very fluid? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | air |  | | Student ResponseB. | ice | Student Response | | C. | water |  | | D. | nitrogen |  | | E. | lava |  | | | | Score: | 1/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | The unit of energy is the \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Newton |  | | Student ResponseB. | Joule | Student Response | | C. | Watt |  | | D. | Pascal |  | | E. | Einstein |  | | | | Score: | 1/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | What process can transfer both matter and energy? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | turbulence | Student Response | | B. | compression waves |  | | C. | displacement waves |  | | D. | group velocity |  | | E. | phase velocity |  | | | | Score: | 1/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | The System International (SI) standard units of distance, time and mass are \_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | meter, second, and kilogram | Student Response | | B. | kilometer, hour, and gram |  | | C. | centimeter, second, and gram |  | | D. | yard, minute, and pound |  | | E. | kilometer, minute, and kilogram |  | | | | Score: | 1/1 | |  | | |
| **6.** |  |
|  | |  |  | | --- | --- | | Over the past several hundred years, the world's population growth curve is \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | linear |  | | B. | quadratic |  | | C. | flat |  | | D. | sinusoidal |  | | Student ResponseE. | exponential | Student Response | | | | Score: | 1/1 | |  | | |
| **7.** |  |
|  | |  |  | | --- | --- | | The bottom layer of the atmosphere, where most of the storms happen, is called the: | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | thermosphere |  | | B. | mesosphere |  | | C. | stratosphere |  | | D. | tropopause |  | | Student ResponseE. | troposphere | Student Response | | | | Score: | 1/1 | |  | | |
| **8.** |  |
|  | |  |  | | --- | --- | | Consider the following three phenomena: 1) a flood caused by a thunderstorm 2) a storm surge caused by a hurricane 3) a tsunami caused by an underwater earthquake  These are ALL directly associated with \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | geothermal energy |  | | Student ResponseB. | both the concentration and dilution of energy | Student Response | | C. | storms |  | | D. | shorter return periods for more-intense phenomena |  | | E. | solar energy |  | | | | Score: | 1/1 | |  | | |
| **9.** |  |
|  | |  |  | | --- | --- | | The distance between crest and neighboring crest of a wave is called: | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | frequency |  | | B. | Hertz |  | | C. | period |  | | Student ResponseD. | wavelength | Student Response | | E. | phase speed |  | | | | Score: | 1/1 | |  | | |
| **10.** |  |
|  | |  |  | | --- | --- | | What is wrong with the value "g = 9.8" for the acceleration due to gravity near the Earth's surface? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | The units are missing. | Student Response | | B. | It needs to be represented in scientific notation with a suffix "x 10-2". |  | | C. | The value 9.8 is an Imperial (British) measure, not a metric measure. |  | | D. | It does not enough significant digits after the decimal point. |  | | E. | It doesn’t include any SI standard prefix like k for kilo, M for mega, etc. |  | | | | Score: | 1/1 | |  | | |
| **11.** |  |
|  | |  |  | | --- | --- | | Which statement is TRUE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | The unit of energy is the Watt. |  | | B. | Energy that is spread out in space is called gradual. |  | | C. | Energy that is spread out in time is called diffuse. |  | | D. | "Conservation of energy" means that energy cannot be tranformed. |  | | Student ResponseE. | Natural disasters often involve energy conversions. | Student Response | | | | Score: | 1/1 | |  | | |
| **12.** |  |
|  | |  |  | | --- | --- | | The layering of less-dense materials on top of more-dense materials is called \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | layerification |  | | B. | calcification |  | | C. | ionization |  | | D. | fracturization |  | | Student ResponseE. | stratification | Student Response | | | | Score: | 1/1 | |  | | |
| **13.** |  |
|  | |  |  | | --- | --- | | The natural crystal shape of common table salt (sodium chloride) is \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | cubic | Student Response | | B. | hexagonal column |  | | C. | dendrite |  | | D. | tetrahedron |  | | E. | octahedron |  | | | | Score: | 1/1 | |  | | |
| **14.** |  |
|  | |  |  | | --- | --- | | A force per unit area applied perpendicular to an object’s surface is called \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | work |  | | B. | stress |  | | C. | strain |  | | Student ResponseD. | pressure | Student Response | | E. | power |  | | | | Score: | 1/1 | |  | | |
| **15.** |  |
|  | |  |  | | --- | --- | | Which statement is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | The ability to permanently change shape is called "plastic". |  | | B. | The ability to temporarily change shape, but to spring back to the original shape is called "elastic". |  | | Student ResponseC. | Objects that fracture instead of bending are called "ductile". | Student Response | | D. | Both gases and liquids are fluids. |  | | E. | Magma has higher viscosity than water. |  | | | | Score: | 1/1 | |  | | |
| **16.** |  |
|  | |  |  | | --- | --- | | Matter able to temporarily change its shape and to return to its original shape when the force is released is \_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | elastic | Student Response | | B. | strain |  | | C. | plastic |  | | D. | ductile |  | | E. | brittle |  | | | | Score: | 1/1 | |  | | |
| **17.** |  |
|  | |  |  | | --- | --- | | When twice as much force is exerted to move a mass over the same distance, the work done \_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | is zero |  | | B. | remains the same |  | | C. | increases by 2 units |  | | D. | is reduced by 2 units |  | | Student ResponseE. | is doubled | Student Response | | | | Score: | 1/1 | |  | | |
| **18.** |  |
|  | |  |  | | --- | --- | | A billion meters can be abbreviated as \_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | mm |  | | B. | cm |  | | C. | km |  | | D. | Mm |  | | Student ResponseE. | Gm | Student Response | | | | Score: | 1/1 | |  | | |
| **19.** |  |
|  | |  |  | | --- | --- | | Consider the wave graphed below. If the phase speed of the wave were to remain constant at 4 m/s, but the wavelength were to double, then the wave frequency would \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | double |  | | B. | quarter |  | | Student ResponseC. | halve | Student Response | | D. | not change |  | | E. | quadruple |  | | | | Score: | 1/1 | |  | | |
| **20.** |  |
|  | |  |  | | --- | --- | | The snowstorm that hit the Lower Mainland in early January 2004 was about as severe as the storm that occurred in 1996 (8 years ago). The estimated Return Period for this category of storm is about: | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | 0.5 year |  | | B. | 2 years |  | | Student ResponseC. | 4 years | Student Response | | D. | 8 years |  | | E. | 16 years |  | | | | Score: | 1/1 | |

|  |  |
| --- | --- |
| **1.** |  |
|  | |  |  | | --- | --- | | Consider the following three phenomena: 1) a flood caused by a thunderstorm 2) a storm surge caused by a hurricane 3) a tsunami caused by an underwater earthquake  These are ALL directly associated with \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | storms |  | | B. | shorter return periods for more-intense phenomena |  | | C. | geothermal energy |  | | Student Response D. | both the concentration and dilution of energy | Student Response | | E. | solar energy |  | | | | Score: | 1/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | Which of the following is TRUE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Gases are the least compressible compared to liquids and solids. |  | | B. | Fluids with low viscosity such as air resist flow more that those with high viscosity such as magma. |  | | C. | Heat of sublimation is released when solids become gases. |  | | Student Response D. | The ability of solids to permanently change shape or deform when forced is called plastic. | Student Response | | E. | Liquids and gases can change their shape easily, thus are not fluids. |  | | | | Score: | 1/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | The common logarithm of 100,000 is \_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | 2 |  | | B. | 3 |  | | C. | 4 |  | | Student Response D. | 5 | Student Response | | E. | 6 |  | | | | Score: | 1/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | An object behaves elastically under strain if it\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | deforms easily and takes on a new shape after the strain is removed |  | | Student Response B. | deforms easily and springs back to its original shape after the strain is removed | Student Response | | C. | is difficult to tear but easy to cut with scissors or a knife |  | | D. | breaks easily when at a cool temperature, but flows under high temperatures. |  | | E. | resists deformation and releases heat when the strain is removed |  | | | | Score: | 1/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | Which is TRUE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | As disaster prediction improves, property and infrastructure losses will generally decrease. |  | | B. | In developed countries, fatalities due to natural disasters are increasing despite more accurate and timely warnings. |  | | C. | When infrastructure is disrupted by natural disasters, the functionality of human society is rarely affected. |  | | Student Response D. | Damage and loss of life from natural disasters can be minimized. | Student Response | | E. | Natural processes become hazards only near large population centres with fragile infrastructure. |  | | | | Score: | 1/1 | |  | | |
| **6.** |  |
|  | |  |  | | --- | --- | | All of the following are forms of energy EXCEPT: | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | latent heat |  | | B. | work |  | | C. | kinetic energy |  | | Student Response D. | force | Student Response | | E. | sensible heat |  | | | | Score: | 1/1 | |  | | |
| **7.** |  |
|  | |  |  | | --- | --- | | If you double the distance that you push an object with a constant force, the amount of work \_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | quarters |  | | B. | halves |  | | C. | remains constant |  | | Student Response D. | doubles | Student Response | | E. | quadruples |  | | | | Score: | 1/1 | |  | | |
| **8.** |  |
|  | |  |  | | --- | --- | | The world population DURING THE PAST DECADE has been \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | decreasing linearly |  | | B. | decreasing exponentially |  | | Student Response C. | growing almost linearly | Student Response | | D. | 10 billion |  | | E. | nearly constant |  | | | | Score: | 1/1 | |  | | |
| **9.** |  |
|  | |  |  | | --- | --- | | Over the past several hundred years, the world's population growth curve is \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | linear |  | | B. | quadratic |  | | C. | flat |  | | D. | sinusoidal |  | | Student Response E. | exponential | Student Response | | | | Score: | 1/1 | |  | | |
| **10.** |  |
|  | |  |  | | --- | --- | | Of the following natural disasters, which one would cause the greatest number of immediate deaths in Western Canada? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | a tornado |  | | B. | a landslide |  | | C. | a major volcanic eruption |  | | Student Response D. | a large-magnitude earthquake |  | | E. | a large-diameter meteor impact | Student Response | | | | Score: | 0/1 | |  | | |
| **11.** |  |
|  | |  |  | | --- | --- | | The top layer of the earth is called the\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | mesosphere |  | | B. | asthenosphere |  | | C. | mantle |  | | D. | core |  | | Student Response E. | crust | Student Response | | | | Score: | 1/1 | |  | | |
| **12.** |  |
|  | |  |  | | --- | --- | | Stress is \_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | mass times acceleration |  | | B. | 0.5 times mass times velocity squared |  | | C. | the deformation of an object |  | | D. | the viscosity of a fluid |  | | Student Response E. | force per unit area | Student Response | | | | Score: | 1/1 | |  | | |
| **13.** |  |
|  | |  |  | | --- | --- | | The System International (SI) standard units of distance, time and mass are \_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student Response A. | meter, second, and kilogram | Student Response | | B. | kilometer, hour, and gram |  | | C. | centimeter, second, and gram |  | | D. | yard, minute, and pound |  | | E. | kilometer, minute, and kilogram |  | | | | Score: | 1/1 | |  | | |
| **14.** |  |
|  | |  |  | | --- | --- | | At present the doubling time for the human population on Earth is roughly \_\_\_\_\_\_ years. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | 1000 |  | | B. | 500 |  | | C. | 100 |  | | Student Response D. | 50 | Student Response | | E. | 10 |  | | | | Score: | 1/1 | |  | | |
| **15.** |  |
|  | |  |  | | --- | --- | | A teragram is equal to \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | one millionth of a gram (10-6) |  | | B. | one thousandth of a gram (10-3) |  | | C. | ten grams (101) |  | | D. | one thousand grams (103) |  | | Student Response E. | one trillion grams (1012) | Student Response | | | | Score: | 1/1 | |  | | |
| **16.** |  |
|  | |  |  | | --- | --- | | "Watt" is the unit for \_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | energy |  | | Student Response B. | power | Student Response | | C. | force |  | | D. | density |  | | E. | stress |  | | | | Score: | 1/1 | |  | | |
| **17.** |  |
|  | |  |  | | --- | --- | | If you double the force applied on an object, the amount of work \_\_\_\_\_\_ | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | quarters |  | | B. | halves |  | | C. | remains constant |  | | Student Response D. | doubles | Student Response | | E. | quadruples |  | | | | Score: | 1/1 | |  | | |
| **18.** |  |
|  | |  |  | | --- | --- | | Layers form in the Earth, ocean, and atmosphere because \_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | heavier objects sink relative to less heavy ones |  | | B. | there is greater pressure acting on the lower layers |  | | C. | of the stress between layers that tends to cause them to deform |  | | D. | the acceleration of gravity decreases with height |  | | Student Response E. | less dense objects float relative to more dense ones | Student Response | | | | Score: | 1/1 | |  | | |
| **19.** |  |
|  | |  |  | | --- | --- | | Recall that the units of specific heat (Cp) are J / kg-K and the units of latent heat (L) are J/kg. Suppose that you have a cold glass of water, and that you notice dew forming on the outside of the glass. You know that the dew is from water vapour in the air condensing on the glass. This condensate causes the water in the glass to become warmer. (Assume for simplicity that the mass of water vapor condensing is the same as the mass of liquid water in the glass, and you may neglect the heat capacity of the glass itself.) You would anticipate that the correct relationship between these variables is \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | ΔT = Cp x L |  | | B. | ΔT = 1 / (Cp x L) |  | | Student Response C. | ΔT = L / Cp | Student Response | | D. | ΔT = Cp / L |  | | E. | there is not enough information to answer this question |  | | | | Score: | 1/1 | |  | | |
| **20.** |  |
|  | |  |  | | --- | --- | | Consider two countries, each with a population of 1 million in the year 2000. The annual population growth rate of Country X is 1% while that of Country Y is 2%. Assuming that the growth rates remain unchanged, which statement is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | By the year 2070, Country X will have a population of 2 million and Country Y will have 4 million.`` |  | | B. | Both countries are experiencing exponential population growth. |  | | C. | Over a period of 140 years, Country Y will have doubled its population 4 times.` |  | | Student Response D. | The doubling time for the population of Country X is estimated as 1 million divided by 1%. | Student Response | | E. | The population of Country Y is increasing much faster that that of the world. |  | | | | Score: | 1/1 | |  | | |

Quiz

|  |  |
| --- | --- |
| **1.** |  |
|  | |  |  | | --- | --- | | Stratification of the Earth, ocean, and atmosphere is expected because of the \_\_\_\_\_\_\_\_ of the materials involved. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | mass |  | | B. | energy |  | | C. | volume |  | | D. | specific heat |  | | Student Response E. | density | Student Response | | | |  |  | |  | | |
| 2. |  |
|  | |  |  | | --- | --- | | When twice as much force is exerted to move a mass over the same distance, the work done \_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | is zero |  | | B. | remains the same |  | | C. | increases by 2 units |  | | D. | is reduced by 2 units |  | | Student Response E. | is doubled | Student Response | | | |  |  | |  | | |
| 3. |  |
|  | |  |  | | --- | --- | | When water vapour condenses, latent heat \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student Response A. | is released as sensible heat | Student Response | | B. | doesn't change |  | | C. | is known as the latent heat of sublimation |  | | D. | is absorbed from sensible heat |  | | E. | is known as the latent heat of fusion |  | | | |  |  | |  | | |
| 4. |  |
|  | |  |  | | --- | --- | | Which of the following statements is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | The estimated ages of the Earth and the oceans is the same order of magnitude. |  | | Student Response B. | More intense natural disasters occur more frequently. | Student Response | | C. | The average depth of the ocean is much shallower than the thickness of the Earth’s atmosphere. |  | | D. | A chemical element consists of identical atoms. |  | | E. | No work is expended against gravity when a 10 kg mass is moved 5 meters horizontally (assuming a frictionless surface). |  | | | |  |  | |  | | |
| 5. |  |
|  | |  |  | | --- | --- | | If two hurricanes hit Nova Scotia in 40 years of recordkeeping, the average return period for hurricanes in Nova Scotia is \_\_\_\_\_ years. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | 2 |  | | Student Response B. | 20 | Student Response | | C. | 40 |  | | D. | 80 |  | | E. | 160 |  | | | |  |  | |  | | |
| 6. |  |
|  | |  |  | | --- | --- | | Carbon-12 and carbon-14 are isotopes of each other because they both contain the same number of \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | positrons |  | | B. | not enough information to answer |  | | C. | carbon atoms |  | | Student Response D. | protons | Student Response | | E. | neutrons |  | | | |  |  | |  | | |
| 7. |  |
|  | |  |  | | --- | --- | | Of the following, which type of natural disaster has the longest time scale for energy build-up time compared to the time scale of energy release? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | tsunami |  | | B. | hurricane |  | | Student Response C. | meteor impact | Student Response | | D. | landslide |  | | E. | earthquake |  | | | |  |  | |  | | |
| 8. |  |
|  | |  |  | | --- | --- | | Which is NOT a form of energy? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | potential |  | | B. | kinetic |  | | C. | heat |  | | D. | work |  | | Student Response E. | power | Student Response | | | |  |  | |  | | |
| 9. |  |
|  | |  |  | | --- | --- | | If you double the distance that you push an object with a constant force, the amount of work \_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | quarters |  | | B. | halves |  | | C. | remains constant |  | | Student Response D. | doubles | Student Response | | E. | quadruples |  | | | |  |  | |  | | |
| 10. |  |
|  | |  |  | | --- | --- | | "Joule" is the unit for \_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | pressure |  | | Student Response B. | energy | Student Response | | C. | power |  | | D. | force |  | | E. | density |  | | | |  |  | |  | | |
| 11. |  |
|  | |  |  | | --- | --- | | The common name for pyrite is \_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student Response A. | fool’s gold | Student Response | | B. | hematite |  | | C. | magnetite |  | | D. | limestone |  | | E. | quartz |  | | | |  |  | |  | | |
| 12. |  |
|  | |  |  | | --- | --- | | Which prefix used with units represents a billion? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | g |  | | B. | b |  | | C. | M |  | | D. | B |  | | Student Response E. | G | Student Response | | | |  |  | |  | | |
| 13. |  |
|  | |  |  | | --- | --- | | The phases of matter are \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | AC and DC |  | | Student Response B. | solid, liquid and gas | Student Response | | C. | AM and FM |  | | D. | electron, proton and neutron |  | | E. | ion, radical and isotope |  | | | |  |  | |  | | |
| 14. |  |
|  | |  |  | | --- | --- | | Which statement is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Human society is more fragile to natural disasters than the planet Earth. |  | | B. | Over the past 100 years, the number of fatalities from natural disasters has increased. |  | | Student Response C. | With improved technology and warning systems, natural disasters can be prevented. | Student Response | | D. | Infrastructures built by man for communication, transportation, and utilities are more fragile to natural disasters than the planet Earth. |  | | E. | Natural disasters are normal components of Earth’s evolution. |  | | | |  |  | |  | | |
|  |  |
| 15. |  |
|  | |  |  | | --- | --- | | The graph below shows the approximate population of humans on earth for years 1960 and 2000. Over most of the evolution of earth's population, population has grown exponentially. Considering only the EXPONENTIAL projection shown in this graph, you would expect the population (in billions) at year 2040 to be roughly \_\_\_\_\_\_. | | |  |  | |



|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | 8 |  | | Student ResponseB. | 12 | Student Response | | C. | 10.5 |  | | D. | 9 |  | | E. | 14 |  | | |
| |  |  | | --- | --- | | **16.** |  | |  | |  |  | | --- | --- | | Layers form in the Earth, ocean, and atmosphere because \_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | heavier objects sink relative to less heavy ones |  | | B. | there is greater pressure acting on the lower layers |  | | C. | of the stress between layers that tends to cause them to deform |  | | D. | the acceleration of gravity decreases with height |  | | Student Response E. | less dense objects float relative to more dense ones | Student Response | | | |  |  | |  | | | | **17.** |  | |  | |  |  | | --- | --- | | What is wrong with the value "g = 9.8" for the acceleration due to gravity near the Earth's surface? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student Response A. | The units are missing. | Student Response | | B. | It does not enough significant digits after the decimal point. |  | | C. | It needs to be represented in scientific notation with a suffix "x 10-2". |  | | D. | The value 9.8 is an Imperial (British) measure, not a metric measure. |  | | E. | It doesn’t include any SI standard prefix like k for kilo, M for mega, etc. |  | | | |  |  | |  | | | | **18.** |  | |  | |  |  | | --- | --- | | The System International (SI) standard units of distance, time and mass are \_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student Response A. | meter, second, and kilogram | Student Response | | B. | kilometer, hour, and gram |  | | C. | centimeter, second, and gram |  | | D. | yard, minute, and pound |  | | E. | kilometer, minute, and kilogram |  | | | |  |  | |  | | | | **19.** |  | |  | |  |  | | --- | --- | | Sulfur is a component of \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | silica |  | | B. | calcite |  | | Student Response C. | pyrite | Student Response | | D. | magnetite |  | | E. | quartz |  | | | |  |  | |  | | | | **20.** |  | |  | |  |  | | --- | --- | | Consider the wave graphed below. If the phase speed of the wave were to remain constant at 4 m/s, but the wavelength were to double, then the wave frequency would \_\_\_\_\_\_. | | | FS-F07M1-6E-7E.gif | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | double |  | | B. | quarter |  | | Student Response C. | halve | Student Response | | D. | quadruple |  | | E. | not change |  | | | |  |  | |  | | | |  |

FRAGILE SYSTEM

1.

Consider Object A with a mass of 10 kg and Object B with a mass of 20 kg, both moving at a speed of 1 m / sec. Which of the following statements is TRUE?

Student Response Correct Answer

A. The kinetic energy of Object B is equal to the kinetic energy of Object A.

B. The kinetic energy of Object B is 2X the kinetic energy of Object A.

C. The kinetic energy of Object A is 2X the kinetic energy of Object B.

D. The kinetic energy of Object A is 5 kg-m / sec.

E. The kinetic energy of Object B is 20 kg-m2 / sec2.

Score: 1/1

2.

Two objects (A and B) of the same mass receive the same amount of heat, but the increase in temperature of object A is less than that of object B. The parameter that describes how the temperature of an object changes with heat input per unit mass is called \_\_\_\_\_\_\_\_.

Student Response Correct Answer

A. stress

B. strain

C. the latent heat constant

D. specific heat

E. density

Score: 1/1

3.

The time between the passage of one wave crest and the next is called the \_\_\_\_\_\_.

Student Response Correct Answer

A. amplitude

B. epoch

C. wavelength

D. frequency

E. period

Score: 1/1

4.

Over the past several hundred years, the world's population growth curve is \_\_\_\_\_\_.

Student Response Correct Answer

A. linear

B. quadratic

C. flat

D. sinusoidal

E. exponential

Score: 1/1

5.

By doing work against gravity to lift a book from your desk and set it on a higher shelf, you INCREASE \_\_\_\_\_\_.

Student Response Correct Answer

A. power

B. kinetic energy

C. latent heat

D. sensible heat

E. potential energy

Score: 1/1

6.

"Pascal" is the unit for \_\_\_\_\_\_\_\_\_.

Student Response Correct Answer

A. pressure

B. energy

C. power

D. force

E. density

Score: 1/1

7.

Which is most dense?

Student Response Correct Answer

A. aluminum

B. ocean water

C. fresh water

D. cold air

E. warm air

Score: 1/1

8.

"Watt" is the unit for \_\_\_\_\_\_\_\_\_.

Student Response Correct Answer

A. energy

B. power

C. force

D. density

E. stress

Score: 1/1

9.

When you raise an object twice as high, the potential energy increases by a factor of \_\_\_\_\_\_\_.

Student Response Correct Answer

A. a half

B. one

C. two

D. four

E. an order of magnitude

Score: 1/1

10.

Which of the following is NOT a disaster scale?

Student Response Correct Answer

A. Richter

B. Fujita

C. Saffir-Simpson

D. Torino

E. Celsius

Score: 1/1

11.

All of the following are forms of energy EXCEPT:

Student Response Correct Answer

A. latent heat

B. work

C. kinetic energy

D. force

E. sensible heat

Score: 1/1

12.

Which statement is FALSE?

Student Response Correct Answer

A. Natural disasters occur when diffuse sources of energy are concentrated and then released into a compact area

B. During natural disasters, energy in one form is transformed into another or many other forms.

C. Solar energy is the ultimate source of energy fueling thunderstorms.

D. Earth’s geological history consists of a series of disastrous events separated by brief periods of calm.

E. Natural disasters occur when energy builds up over a long period of time, then released suddenly and violently.

Score: 1/1

13.

Which component of the Earth system is the most fragile and vulnerable to natural disasters?

Student Response Correct Answer

A. human population

B. volcanoes and landslides

C. the atmosphere and oceans

D. the Earth’s continents

E. transportation and utilities

Score: 0/1

14.

The unit of energy is the \_\_\_\_\_\_.

Student Response Correct Answer

A. Newton

B. Joule

C. Watt

D. Pascal

E. Einstein

Score: 1/1

15.

Which statement is TRUE? The most common element in the \_\_\_\_\_\_\_\_\_\_.

Student Response Correct Answer

A. Earth’s core is silicon

B. Earth’s crust is silicon

C. Earth’s crust is iron

D. atmosphere is oxygen

E. Earth’s crust is oxygen

Score: 1/1

16.

Over the 50-year interval between 1950 and 2000, the towns of Tofino and Port Alberni on Vancouver Island have been hit by 5 tsunami. The Return Period (RP) for tsunami in these towns is \_\_\_\_\_\_\_\_.

Student Response Correct Answer

A. 1/5 year

B. 1/9 year

C. 10 years

D. 25 years

E. 50 years

Score: 1/1

17.

When a meteor hits Earth, its destructiveness results from energy converted FROM \_\_\_\_\_\_\_.

Student Response Correct Answer

A. latent heat

B. kinetic energy

C. sensible heat

D. work

E. E=mc2

Score: 1/1

18.

Carbon-12 and carbon-14 are isotopes of each other because they both contain the same number of \_\_\_\_\_\_.

Student Response Correct Answer

A. carbon atoms

B. positrons

C. neutrons

D. not enough information to answer

E. protons

Score: 1/1

19.

Which statement is FALSE?

Student Response Correct Answer

A. Natural disasters occur when diffuse sources of energy are concentrated and then released into a compact area.

B. During natural disasters, energy in one form is transformed into another or many other forms.

C. Solar energy is the ultimate source of energy fueling thunderstorms.

D. Earth’s geological history consists of a series of disastrous events separated by brief periods of calm.

E. Natural disasters occur when energy builds up over a long period of time, then released suddenly and violently.

Score: 1/1

20.

Which statement is TRUE?

Student Response Correct Answer

A. Liquids are very compressible.

B. High viscosity fluid flows very easily.

C. Stress is force per unit volume parallel to a surface.

D. Material that fractures easily is said to be ductile.

E. Strain is the deformation of a solid object.

Score: 1/1

ANSWERS: B, D, E, E, E, A, A, B, C, E, D, D, E, B, E, C, B, E, D, E

1.

Most disaster scales are logarithmic; namely, each increase by 1 of the scale value corresponds to roughly a ten-fold increase in the strength of the disaster. The main reason for using this type of disaster scale is \_\_\_\_\_\_.

Student Response Correct Answer

A. most disasters vary by many orders of magnitude

B. it is more confusing to the general public, thus strengthening the egos of scientists

C. the more intense disasters happen less frequently

D. the logarithmic values are smaller and more compact, thus easier to store in computer-file archives

E. the risk (i.e., threat to life) is related to both the disaster strength and its return period

Score: 1/1

2.

The three greatest chemical elemental components of the Earth’s crust are \_\_\_\_\_.

Student Response Correct Answer

A. nitrogen, oxygen, hydrogen

B. oxygen, silicon, aluminum

C. silicon, iron, calcium

D. aluminum, carbon, sodium

E. silicon, magnesium, iron

Score: 1/1

3.

When you raise an object twice as high, the potential energy increases by a factor of \_\_\_\_\_\_\_.

Student Response Correct Answer

A. a half

B. one

C. two

D. four

E. an order of magnitude

Score: 1/1

4.

The top layer of the earth is called the\_\_\_\_\_\_\_.

Student Response Correct Answer

A. mesosphere

B. asthenosphere

C. mantle

D. core

E. crust

Score: 1/1

5.

Why are many disaster intensities quantified using a logarithmic scale?

Student Response Correct Answer

A. More intense disasters happen less frequently than weaker disasters.

B. Earthquakes are more powerful than tornadoes.

C. Scientists like to confuse the public by using complicated disaster scales.

D. Disaster intensities vary by many orders of magnitude.

E. Many disasters are cyclic.

Score: 1/1

6.

Which disaster is related to the dilution of energy?

Student Response Correct Answer

1. earthquakes

2. thunderstorms

3. volcanoes

4. hurricanes

5. floods

Score: 1/1

7.

In terms of population growth, the phrase "doubling time" refers to \_\_\_\_\_\_\_\_\_\_.

Student Response Correct Answer

A. two times the annual growth rate

B. linear growth

C. 70 years

D. period of time for the population to increase by 2 percent

E. period of time required to double the present population

Score: 1/1

8.

During a 300-day period, 900 earthquakes of magnitude 5 are typically observed. Thus, the return period for a magnitude 5 earthquake is \_\_\_\_\_\_\_.

Student Response Correct Answer

A. 900 years

B. 300 years

C. 5 years

D. 3 days

E. 1/3 of a day

Score: 1/1

9.

Which of the following best describes the world’s population since 1900?

Student Response Correct Answer

A. growth trends with periods of rapid decline followed by sudden bursts of growth

B. constant world population for the last 100 years

C. linear growth pattern

D. rapid growth consisting of adding the same number of individuals each year

E. growth in ever-increasing increments (e.g., 2 percent annual growth)

Score: 1/1

10.

The form of energy common to all the natural disasters to be studied in this course is \_\_\_\_\_\_\_\_\_\_\_.

Student Response Correct Answer

A. impending energy

B. stress

C. kinetic energy

D. work

E. potential energy

Score: 1/1

11.

Every year, more people are affected by natural disasters MOSTLY because \_\_\_\_\_\_.

Student Response Correct Answer

A. sea level is rising, putting large coastal cities at risk

B. of global warming

C. as population increases, more people live in high risk areas

D. the ozone hole allows more visible light to reach the earth's surface

E. natural disasters occur more frequently and of greater intensity

Score: 1/1

12.

When water vapour condenses, latent heat \_\_\_\_\_\_.

Student Response Correct Answer

A. is released as sensible heat

B. doesn't change

C. is known as the latent heat of sublimation

D. is absorbed from sensible heat

E. is known as the latent heat of fusion

Score: 1/1

13.

Wave frequency has units of\_\_\_\_\_\_\_.

Student Response Correct Answer

A. m

B. m/s

C. Hz

D. s

E. Pa

Score: 1/1

14.

The speed at which wave energy propagates is called the \_\_\_\_\_\_ speed.

Student Response Correct Answer

A. phase

B. translation

C. flow

D. kinetic

E. group

Score: 1/1

15.

Which statement is CORRECT?

Student Response Correct Answer

A. Stress is a force per unit area.

B. Power is energy x time.

C. Pressure per unit time is force.

D. Force is quantified in newtons per square meter.

E. Energy is power times distance.

Score: 1/1

16.

The distance 35,000 km is equal to \_\_\_\_\_\_.

Student Response Correct Answer

A. 3.5 x 107 m

B. 0.035 x 109 cm

C. 35 x 106 mm

D. 3.5 x 104 m

E. 3.5 kkm

Score: 1/1

17.

Turbulence \_\_\_\_\_\_\_\_\_\_\_.

Student Response Correct Answer

A. has regular oscillations

B. is easily predictable

C. cannot transport matter

D. rarely occurs in the atmosphere

E. can transport energy

Score: 1/1

18.

Consider Object A with a mass of 10 kg and Object B with a mass of 20 kg, both moving at a speed of 1 m / sec. Which of the following statements is TRUE?

Student Response Correct Answer

A. The kinetic energy of Object B is equal to the kinetic energy of Object A.

B. The kinetic energy of Object B is 2X the kinetic energy of Object A.

C. The kinetic energy of Object A is 2X the kinetic energy of Object B.

D. The kinetic energy of Object A is 5 kg-m / sec.

E. The kinetic energy of Object B is 20 kg-m2 / sec2.

Score: 1/1

19.

The amount of heat that 1 kg of matter holds when it warms 1 degree Celsius is called \_\_\_\_\_\_\_\_\_\_\_\_.

Student Response Correct Answer

A. latent heat

B. relative heat

C. absolute heat

D. specific heat

Score: 1/1

20.

The normal crystal shape for ice is \_\_\_\_\_\_\_\_\_\_.

Student Response Correct Answer

A. pentagonal

B. cubic

C. tetrahedral

D. octahedral

E. hexagonal

Score: 1/1

ABCED EEEEC CACEA AEBEE

**Chapter 1**

**Main Quiz**

|  |  |
| --- | --- |
| **1.** |  |
|  | |  | | --- | | During one year of measurement, 10 tornadoes of category 5 on the Fujita scale were observed. The corresponding return period in days is about \_\_\_\_\_\_\_\_. | |  | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | 5 |  | | B. | 10 |  | | Student Response C. | **36** | Student Response | | D. | 50 |  | | E. | 365 |  | | |  | |
| **2.** |  |
|  | |  | | --- | | Why are many disaster intensities quantified using a logarithmic scale? | |  | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | More intense disasters happen less frequently than weaker disasters. |  | | B. | Earthquakes are more powerful than tornadoes. |  | | C. | Scientists like to confuse the public by using complicated disaster scales. |  | | Student Response D. | **Disaster intensities vary by many orders of magnitude.** | Student Response | | E. | Many disasters are cyclic. |  | | |  | |
| **3.** |  |
|  | |  |  | | --- | --- | | In terms of population growth, the phrase "doubling time" refers to \_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | two times the annual growth rate |  | | B. | linear growth |  | | C. | 70 years |  | | D. | period of time for the population to increase by 2 percent |  | | **Student Response E.** | **period of time required to double the present population** | **Student Response** | | | | Score: | 1/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | Of the following, which type of natural disaster has the longest time scale for energy build-up time compared to the time scale of energy release? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | tsunami |  | | B. | hurricane |  | | **Student Response C.** | **meteor impact** | Student Response | | D. | landslide |  | | E. | earthquake |  | | | | Score: | 1/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | Density is important because \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | it has units of kg/m2 |  | | **Student Response B.** | **it creates stratification in materials** | Student Response | | C. | heavy objects sink and light objects float |  | | D. | it is represented by the Greek symbol ρ |  | | E. | less dense objects sink and denser objects float |  | | | | Score: | 1/1 | |  | | |
| **6.** |  |
|  | |  |  | | --- | --- | | Which is an example of an element? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | table salt |  | | B. | water |  | | C. | carbon dioxide |  | | Student Response D. | **nitrogen** | Student Response | | E. | limestone |  | | | | Score: | 1/1 | |  | | |
| **7.** |  |
|  | |  |  | | --- | --- | | Consider Object A with a mass of 10 kg and Object B with a mass of 20 kg, both moving at a speed of 1 m / sec. Which of the following statements is TRUE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | The kinetic energy of Object B is equal to the kinetic energy of Object A. |  | | **Student Response B.** | **The kinetic energy of Object B is 2X the kinetic energy of Object A.** | Student Response | | C. | The kinetic energy of Object A is 2X the kinetic energy of Object B. |  | | D. | The kinetic energy of Object A is 5 kg-m / sec. |  | | E. | The kinetic energy of Object B is 20 kg-m2 / sec2. |  | | | | Score: | 1/1 | |  | | |
| **8.** |  |
|  | |  |  | | --- | --- | | The world population DURING THE PAST DECADE has been \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | nearly constant |  | | **Student Response B.** | **growing almost linearly** | Student Response | | C. | decreasing linearly |  | | D. | 10 billion |  | | E. | decreasing exponentially |  | | | | Score: | 1/1 | |  | | |
| **9.** |  |
|  | |  |  | | --- | --- | | What is wrong with the value "g = 9.8" for the acceleration due to gravity near the Earth's surface? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | **Student Response A.** | **The units are missing.** | Student Response | | B. | It does not enough significant digits after the decimal point. |  | | C. | The value 9.8 is an Imperial (British) measure, not a metric measure. |  | | D. | It needs to be represented in scientific notation with a suffix "x 10-2". |  | | E. | It doesn’t include any SI standard prefix like k for kilo, M for mega, etc. |  | | | | Score: | 1/1 | |  | | |
| **10.** |  |
|  | |  |  | | --- | --- | | The layering of less-dense materials on top of more-dense materials is called \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | layerification |  | | B. | calcification |  | | C. | ionization |  | | D. | fracturization |  | | **Student Response E.** | **stratification** | Student Response | | | | Score: | 1/1 | |  | | |
| **11.** |  |
|  | |  |  | | --- | --- | | When a meteor hits Earth, its destructiveness results from energy converted FROM \_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | latent heat |  | | **Student Response B.** | **kinetic energy** | Student Response | | C. | sensible heat |  | | D. | work |  | | E. | E=mc2 |  | | | | Score: | 1/1 | |  | | |
| **12.** |  |
|  | |  |  | | --- | --- | | Which form of energy is related to the distance an object moves times the force moving it? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | **Student Response A.** | **work** | Student Response | | B. | latent heat |  | | C. | potential energy |  | | D. | power |  | | E. | sensible heat |  | | | | Score: | 1/1 | |  | | |
| **13.** |  |
|  | |  |  | | --- | --- | | The common logarithm of 100,000 is \_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | 2 |  | | B. | 3 |  | | C. | 4 |  | | **Student Response D.** | **5** | Student Response | | E. | 6 |  | | | | Score: | 1/1 | |  | | |
| **14.** |  |
|  | |  |  | | --- | --- | | Over short-time scales (hours to days) under Earth's surface pressure, which of the following is considered NOT very fluid? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | air |  | | **Student Response B.** | **ice** | Student Response | | C. | water |  | | D. | nitrogen |  | | E. | lava |  | | | | Score: | 1/1 | |  | | |
| **15.** |  |
|  | |  |  | | --- | --- | | The distance 35,000 km is equal to \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | 35 x 106 mm |  | | B. | 0.035 x 109 cm |  | | C. | 3.5 x 104 m |  | | D. | 3.5 kkm |  | | **Student Response E.** | **3.5 x 107 m** | Student Response | | | | Score: | 1/1 | |  | | |
| **16.** |  |
|  | |  |  | | --- | --- | | Over the past several hundred years, the world's population growth curve is \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | linear |  | | B. | quadratic |  | | C. | flat |  | | D. | sinusoidal |  | | **Student Response E.** | **exponential** | Student Response | | | | Score: | 1/1 | |  | | |
| **17.** |  |
|  | |  |  | | --- | --- | | A weather satellite is orbiting the Earth. It is at an altitude 850 km above the Earth's surface, and moves with speed 7.4 km/s. It has a mass of 2,200 kg. Because of its altitude, it has potential energy. Because of its speed, it has kinetic energy. Consider total energy defined as the sum of kinetic + potential energies. Which process would increase the total energy the most? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | doubling the number of days it is in orbit |  | | B. | doubling the Earth’s gravitational acceleration |  | | C. | doubling the altitude above the Earth's surface |  | | Student Response D. | doubling the size of the solar panels on the satellite |  | | **E.** | **doubling the speed of the satellite** | Student Response | | | | Score: | 0/1 | |  | | |
| **18.** |  |
|  | |  |  | | --- | --- | | If you double the force applied on an object, the amount of work \_\_\_\_\_\_ | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | quarters |  | | B. | halves |  | | C. | remains constant |  | | **Student Response D.** | **doubles** | Student Response | | E. | quadruples |  | | | | Score: | 1/1 | |  | | |
| **19.** |  |
|  | |  |  | | --- | --- | | The amount of heat that 1 kg of matter holds when it warms 1 degree Celsius is called \_\_\_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | latent heat |  | | B. | relative heat |  | | C. | absolute heat |  | | **Student Response D.** | **specific heat** | Student Response | | | | Score: | 1/1 | |  | | |
| **20.** |  |
|  | |  |  | | --- | --- | | The snowstorm that hit the Lower Mainland in early January 2004 was about as severe as the storm that occurred in 1996 (8 years ago). The estimated Return Period for this category of storm is about: | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | 0.5 year |  | | B. | 2 years |  | | C. | 4 years | Student Response | | **Student Response D.** | **8 years** |  | | E. | 16 years |  | | | | Score: | 0/1 | |

**Practice Quizzes**

|  |  |
| --- | --- |
| **.** |  |
|  | |  |  | | --- | --- | | A force per unit area applied perpendicular to an object’s surface is called \_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | work |  | | B. | stress |  | | C. | strain |  | | D. | pressure |  | | Student Response E. | power | 0% | | | | Score: | 0/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | The top layer of Earth is called the\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | troposphere |  | | B. | stratosphere |  | | C. | mesosphere |  | | D. | abyssal layer |  | | **Student Response E.** | **lithosphere** | 100% | | | | Score: | 1/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | When twice as much force is exerted to move a mass over the same distance, the work done \_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | is zero |  | | B. | remains the same |  | | C. | increases by 2 units |  | | D. | is reduced by 2 units |  | | **Student Response E.** | **is doubled** | 100% | | | | Score: | 1/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | The Earth and oceans are layered because \_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | dense materials tend to occupy more space |  | | Student Response B. | **less-dense materials float on top of denser materials** | 100% | | C. | plants and animals survive optimally in warm temperatures |  | | D. | gravitational attraction is greatest when 2 bodies are farthest apart |  | | E. | heavier materials are more common in Earth’s crust |  | | | | Score: | 1/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | Which statement is FALSE? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | Student Response A. | A sustainable society is resilient to natural hazards. | 0% | | B. | Volcanoes, landslides, and earthquakes are natural disasters to the Earth. |  | | C. | Energy can cause things to move or change. |  | | D. | The unit of force is the Newton. |  | | E. | Sensible heat is heat that you can feel. |  | | | | Score: | 0/1 | |

|  |  |
| --- | --- |
| **1.** |  |
|  | |  |  | | --- | --- | | If a meteor strikes the ocean at the equator and causes sea water to boil, this is an example of \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | energy conservation |  | | B. | the continuity effect |  | | C. | Newton's Law |  | | D. | the Bermuda High |  | | Student Response E. | the Coriolis effect | 0% | | | | Score: | 0/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | The distance 35,000 km is equal to \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | 3.5 x 104 m |  | | B. | 3.5 kkm |  | | **Student Response C.** | **3.5 x 107 m** | 100% | | D. | 35 x 106 mm |  | | E. | 0.035 x 109 cm |  | | | | Score: | 1/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | For compression waves, the oscillations are \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | perpendicular to propagation direction |  | | B. | parallel to the propagation direction |  | | C. | quickly damped and propagate very short distances |  | | Student Response D. | unable to propagate through air | 0% | | E. | similar to the motion of ocean surface waves |  | | | | Score: | 0/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | The natural crystal shape of common table salt (sodium chloride) is \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | **Student Response A.** | **cubic** | 100% | | B. | hexagonal column |  | | C. | dendrite |  | | D. | tetrahedron |  | | E. | octahedron |  | | | | Score: | 1/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | Which statement is TRUE? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | Liquids are very compressible. |  | | Student Response B. | High viscosity fluid flows very easily. | 0% | | C. | Stress is force per unit volume parallel to a surface. |  | | D. | Material that fractures easily is said to be ductile. |  | | E. | Strain is the deformation of a solid object. |  | | | | Score: | 0/1 | |  | | |

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| --- | --- | --- |
| Title: | | **Quiz: Fragile Systems** |
| Started: | | January 18, 2012 11:14 PM |
| Submitted: | | January 18, 2012 11:31 PM |
| Time spent: | | [00:16:09](javascript:openNewWindow('viewAttemptEventsLog.dowebct?assmtAttemptId=8693812121301','ViewAccessLog','500','500')) |
| **Total score:** | | **18/20 = 90%** https://www.vista.ubc.ca/webct/images/dot_divide.gifTotal score adjusted by 0.0 https://www.vista.ubc.ca/webct/images/dot_divide.gifMaximum possible score: 20 |
| **1.** |  |
|  | |  |  | | --- | --- | | Which is NOT a primary energy source that makes the Earth an active body? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | electric power generated by the Earth’s rotating magnetic field | Student Response | | B. | impact of extraterrestrial bodies such as asteroids and comets |  | | C. | gravity |  | | D. | the Earth’s internal heat associated with natural radioactive decay |  | | E. | the sun |  | | | | Score: | 1/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | Energy conversion resulting from asteroid impacts is from \_\_\_\_\_ energy. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | potential to kinetic |  | | B. | kinetic to power |  | | C. | work to heat |  | | Student ResponseD. | kinetic to heat | Student Response | | E. | work to kinetic |  | | | | Score: | 1/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | If two hurricanes hit Nova Scotia in 40 years of recordkeeping, the average return period for hurricanes in Nova Scotia is \_\_\_\_\_ years. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | 2 |  | | Student ResponseB. | 20 | Student Response | | C. | 40 |  | | D. | 80 |  | | E. | 160 |  | | | | Score: | 1/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | If the population growth is exponential, 60 years from now the Earth’s population will likely be \_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | eliminated by a meteor impact |  | | B. | half of the present population |  | | C. | about the same as now |  | | Student ResponseD. | roughly double of the present population | Student Response | | E. | roughly 6 times the present population |  | | | | Score: | 1/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | The following are components of an atom EXCEPT \_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | proton |  | | B. | neutrons |  | | C. | nucleus |  | | D. | electrons |  | | Student ResponseE. | isotope | Student Response | | | | Score: | 1/1 | |  | | |
| **6.** |  |
|  | |  |  | | --- | --- | | The top layer of Earth is called the\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | troposphere |  | | B. | stratosphere |  | | C. | mesosphere |  | | D. | abyssal layer |  | | Student ResponseE. | lithosphere | Student Response | | | | Score: | 1/1 | |  | | |
| **7.** |  |
|  | |  |  | | --- | --- | | Stress is \_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | mass times acceleration |  | | B. | 0.5 times mass times velocity squared |  | | C. | the deformation of an object |  | | D. | the viscosity of a fluid |  | | Student ResponseE. | force per unit area | Student Response | | | | Score: | 1/1 | |  | | |
| **8.** |  |
|  | |  |  | | --- | --- | | Layers form in the Earth, ocean, and atmosphere because \_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | heavier objects sink relative to less heavy ones |  | | B. | there is greater pressure acting on the lower layers |  | | C. | of the stress between layers that tends to cause them to deform |  | | D. | the acceleration of gravity decreases with height |  | | Student ResponseE. | less dense objects float relative to more dense ones | Student Response | | | | Score: | 1/1 | |  | | |
| **9.** |  |
|  | |  |  | | --- | --- | | Which is TRUE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | As disaster prediction improves, property and infrastructure losses will generally decrease. |  | | B. | In developed countries, fatalities due to natural disasters are increasing despite more accurate and timely warnings. |  | | C. | When infrastructure is disrupted by natural disasters, the functionality of human society is rarely affected. |  | | Student ResponseD. | Damage and loss of life from natural disasters can be minimized. | Student Response | | E. | Natural processes become hazards only near large population centres with fragile infrastructure. |  | | | | Score: | 1/1 | |  | | |
| **10.** |  |
|  | |  |  | | --- | --- | | "Joule" is the unit for \_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | pressure |  | | Student ResponseB. | energy | Student Response | | C. | power |  | | D. | force |  | | E. | density |  | | | | Score: | 1/1 | |  | | |
| **11.** |  |
|  | |  |  | | --- | --- | | Which statement is TRUE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Human infrastructure will become easier to maintain with greater human populations. |  | | B. | The Earth has unlimited carrying capacity. |  | | C. | Competition for resources will likely decrease in the near future. |  | | Student ResponseD. | Many disasters involve the gradual build-up and sudden release of energy. | Student Response | | E. | Compared to developing countries, Canada suffers more fatalities and more economic loss due to natural disasters. |  | | | | Score: | 1/1 | |  | | |
| **12.** |  |
|  | |  |  | | --- | --- | | Which of the following best describes the world’s population since 1900? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | growth trends with periods of rapid decline followed by sudden bursts of growth |  | | B. | constant world population for the last 100 years |  | | C. | linear growth pattern |  | | D. | rapid growth consisting of adding the same number of individuals each year |  | | Student ResponseE. | growth in ever-increasing increments (e.g., 2 percent annual growth) | Student Response | | | | Score: | 1/1 | |  | | |
| **13.** |  |
|  | |  |  | | --- | --- | | The carrying capacity of Earth is \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | the population that can be supported, given the quantity of food, energy, etc. | Student Response | | B. | is proportional to the surface area of the earth times the height of the tallest buildings |  | | C. | the amount of electric charge that can be stored between the atmosphere and the ground |  | | D. | the amount of lithosphere (Earth's crust) that can be supported by the underlying mantle |  | | E. | related to the pressure at the bottom of the atmosphere |  | | | | Score: | 1/1 | |  | | |
| **14.** |  |
|  | |  |  | | --- | --- | | The graph below shows the approximate population of humans on earth for years 1960 and 2000. Over most of the evolution of earth's population, population has grown exponentially. Considering only the EXPONENTIAL projection shown in this graph, you would expect the population (in billions) at year 2040 to be roughly \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | 9 |  | | B. | 12 | Student Response | | C. | 8 |  | | D. | 14 |  | | E. | 10.5 |  | | | | Score: | 0/1 | |  | | |
| **15.** |  |
|  | |  |  | | --- | --- | | Which statement is TRUE regarding wave energy? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | Student ResponseA. | Wave energy always travels at the group velocity. | Student Response | | B. | Wave energy has units of Watts. |  | | C. | Compression waves don't possess wave energy, while displacement waves do. |  | | D. | Wave energy always travels at the phase velocity. |  | | E. | Wave energy has units of Newtons. |  | | | | Score: | 1/1 | |  | | |
| **16.** |  |
|  | |  |  | | --- | --- | | In terms of population growth, the phrase "doubling time" refers to \_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | two times the annual growth rate |  | | B. | linear growth |  | | C. | 70 years |  | | D. | period of time for the population to increase by 2 percent |  | | Student ResponseE. | period of time required to double the present population | Student Response | | | | Score: | 1/1 | |  | | |
| **17.** |  |
|  | |  |  | | --- | --- | | Which of the following statements is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Oxygen is a major component of air and water. |  | | B. | Carbon is a component of living things such as plants and of non-living things such as diamonds. |  | | C. | Table salt is composed of sodium and chlorine. |  | | D. | Calcium is a component of human bones, fish bones, and seashells. |  | | Student ResponseE. | Iron is a major component of the Earth’s core but does NOT occur on the Earth’s crust. | Student Response | | | | Score: | 1/1 | |  | | |
| **18.** |  |
|  | |  |  | | --- | --- | | Which statement is TRUE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | The survivability rate of people in natural disasters will increase as population grows, due to better social networks. |  | | Student ResponseB. | Population is self-limiting. Namely, the death rate increases when the carrying capacity is exceeded. | Student Response | | C. | Earth's carrying capacity increases as more people occupy our planet. |  | | D. | You have almost no control over your own chances of surviving a natural disaster. |  | | E. | The maximum population that can be carried by the earth is fixed. |  | | | | Score: | 1/1 | |  | | |
| **19.** |  |
|  | |  |  | | --- | --- | | According to our textbook, if a disaster such as an earthquake were to hit Vancouver, the restoration of major urban services will approximately take \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | 2 weeks | Student Response | | B. | 7 weeks |  | | C. | 1 week |  | | D. | 1 day |  | | Student ResponseE. | 14 weeks |  | | | | Score: | 0/1 | |  | | |
| **20.** |  |
|  | |  |  | | --- | --- | | Which statement is FALSE? | | |  | | | |  | **Student Response** | **Correct Answer** | | --- | --- | --- | | A. | Two types of molecular bonds are ionic and covalent. |  | | B. | Silicate is an example of a tightly-bonded group of atoms that is not a complete molecule. |  | | Student ResponseC. | The crystal structure of ice is octahedral. | Student Response | | D. | Crystals can have directions of weakness called cleavage planes. |  | | E. | Both gases and liquids are fluids. |  | | | | Score: | 1/1 | |  | | |

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| Title: | | **PQ1 Fragile Systems** |
| Started: | | January 18, 2012 8:13 PM |
| Submitted: | | January 18, 2012 8:18 PM |
| Time spent: | | [00:05:12](javascript:openNewWindow('viewAttemptEventsLog.dowebct?assmtAttemptId=8693211668221','ViewAccessLog','500','500')) |
| **Total score:** | | **3/5 = 60%** https://www.vista.ubc.ca/webct/images/dot_divide.gifTotal score adjusted by 0.0 https://www.vista.ubc.ca/webct/images/dot_divide.gifMaximum possible score: 5 |
| **1.** |  |
|  | |  |  | | --- | --- | | A weather satellite is orbiting the Earth. It is at an altitude 850 km above the Earth's surface, and moves with speed 7.4 km/s. It has a mass of 2,200 kg. Because of its altitude, it has potential energy. Because of its speed, it has kinetic energy. Consider total energy defined as the sum of kinetic + potential energies. Which process would increase the total energy the most? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | doubling the size of the solar panels on the satellite |  | | B. | doubling the Earth’s gravitational acceleration |  | | Student ResponseC. | doubling the speed of the satellite | 100% | | D. | doubling the altitude above the Earth's surface |  | | E. | doubling the number of days it is in orbit |  | | | | Score: | 1/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | An object behaves elastically under strain if it\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | deforms easily and takes on a new shape after the strain is removed |  | | Student ResponseB. | deforms easily and springs back to its original shape after the strain is removed | 100% | | C. | is difficult to tear but easy to cut with scissors or a knife |  | | D. | breaks easily when at a cool temperature, but flows under high temperatures. |  | | E. | resists deformation and releases heat when the strain is removed |  | | | | Score: | 1/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | Carbon-12 and carbon-14 are isotopes of each other because they both contain the same number of \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | Student ResponseA. | protons | 100% | | B. | not enough information to answer |  | | C. | positrons |  | | D. | carbon atoms |  | | E. | neutrons |  | | | | Score: | 1/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | Which statement is CORRECT? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | Stress is a force per unit area. |  | | B. | Pressure per unit time is force. |  | | C. | Power is energy x time. |  | | Student ResponseD. | Force is quantified in newtons per square meter. | 0% | | E. | Energy is power times distance. |  | | | | Score: | 0/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | Consider the wave graphed below. If the phase speed of the wave were to remain constant at 4 m/s, but the wavelength were to double, then the wave frequency would \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | not change |  | | B. | quarter |  | | Student ResponseC. | quadruple | 0% | | D. | double |  | | E. | halve |  | | | | Score: | 0/1 | |

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| --- | --- | --- |
| Title: | | **PQ2 Fragile Systems** |
| Started: | | January 18, 2012 8:28 PM |
| Submitted: | | January 18, 2012 8:29 PM |
| Time spent: | | [00:00:29](javascript:openNewWindow('viewAttemptEventsLog.dowebct?assmtAttemptId=8693261455221','ViewAccessLog','500','500')) |
| **Total score:** | | **4/5 = 80%** https://www.vista.ubc.ca/webct/images/dot_divide.gifTotal score adjusted by 0.0 https://www.vista.ubc.ca/webct/images/dot_divide.gifMaximum possible score: 5 |
| **1.** |  |
|  | |  |  | | --- | --- | | Consider the following three phenomena: 1) a flood caused by a thunderstorm 2) a storm surge caused by a hurricane 3) a tsunami caused by an underwater earthquake  These are ALL directly associated with \_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | shorter return periods for more-intense phenomena |  | | Student ResponseB. | both the concentration and dilution of energy | 100% | | C. | geothermal energy |  | | D. | solar energy |  | | E. | storms |  | | | | Score: | 1/1 | |  | | |
| **2.** |  |
|  | |  |  | | --- | --- | | The frequency of a wave with a period of 2 seconds is \_\_\_\_\_\_ cycles/second. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | 1/4 |  | | Student ResponseB. | 1/2 | 100% | | C. | 1 |  | | D. | 2 |  | | E. | 4 |  | | | | Score: | 1/1 | |  | | |
| **3.** |  |
|  | |  |  | | --- | --- | | The graph at right shows the approximate population of humans on earth for years 1960 and 2000. Recent projections expect that population will increase linearly with time. Considering only this LINEAR projection, you would expect the population (in billions) at year 2040 to be roughly \_\_\_\_\_\_\_\_\_\_. | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | 8 |  | | Student ResponseB. | 9 | 100% | | C. | 10.5 |  | | D. | 12 |  | | E. | 14 |  | | | | Score: | 1/1 | |  | | |
| **4.** |  |
|  | |  |  | | --- | --- | | Which of the following best describes the world’s population since 1900? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | growth trends with periods of rapid decline followed by sudden bursts of growth |  | | B. | constant world population for the last 100 years |  | | C. | linear growth pattern |  | | D. | rapid growth consisting of adding the same number of individuals each year |  | | Student ResponseE. | growth in ever-increasing increments (e.g., 2 percent annual growth) | 100% | | | | Score: | 1/1 | |  | | |
| **5.** |  |
|  | |  |  | | --- | --- | | Which statement is TRUE? | | |  | | | |  | **Student Response** | **Value** | | --- | --- | --- | | A. | Liquids are very compressible. |  | | B. | High viscosity fluid flows very easily. |  | | Student ResponseC. | Stress is force per unit volume parallel to a surface. | 0% | | D. | Material that fractures easily is said to be ductile. |  | | E. | Strain is the deformation of a solid object. |  | | | | Score: | 0/1 | |