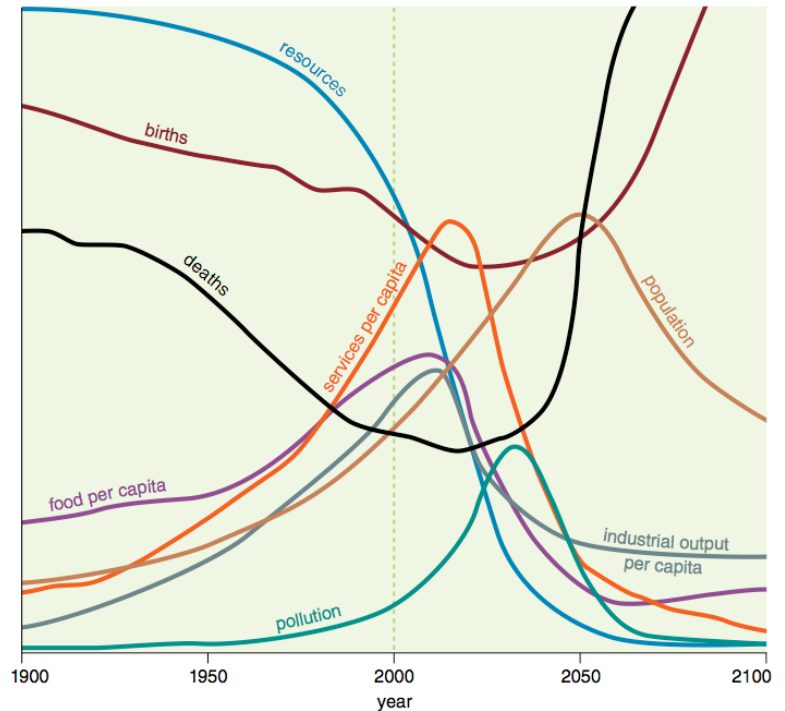


Instructions: Closed book. No calculator. Indicate all your answers on the Scantron sheet. Only the Scantron sheet will be marked, but turn in both the Scantron (answer) sheet and this question packet. Put your name and student number on both the Scantron sheet and the question packet. There is only one best answer to each question. Don't leave any questions unanswered (if you don't know the answer, then guess). Good luck!

This is "Test Form" (A). Please indicate (A) in the "Test Form" column on your Scantron sheet.

1. If you have data from one earthquake recording station you can determine
A) when the next earthquake will occur. B) the distance from the station to the epicenter. C) two places where the earthquake might have occurred. D) if a tsunami was triggered. E) the latitude and longitude of the epicenter.
2. About how much more ENERGY does a magnitude 7 earthquake release than a magnitude 5 earthquake?
A) 10 times B) 100 times C) 1000 times D) 10,000 times E) 100,000 times
3. The following locations are equidistant from the epicenter of a 6.1 magnitude earthquake. Where will the shaking be felt most strongly?
A) In a 25 storey concrete building built on alluvial sediments. B) In a brick house built on granite bedrock.
C) In a 3 storey concrete building built on alluvial sediments.
D) In a wooden cabin built on alluvial sediments.
E) In a steel shack built on granite bedrock
4. Which indicator is the most reliable for earthquake prediction? A) Animal behaviour. B) Deformation at the surface.
C) Seismic gaps compared to past records. D) Measurements of seasonal rainfall. E) Occurrence and strength of earthquake foreshocks.
5. Which statement is FALSE? A) Earthquakes can trigger tsunami due to ground rupture on the ocean floor. B) Earthquakes can cause buildings to fall over intact due to liquefaction. C) Earthquakes can trigger dangerous landslides. D) Earthquakes often trigger volcanic activity nearby. E) Collapsing buildings can result in a large amount of casualties during earthquakes.
6. The Cascadia subduction zone A) moves smoothly due to the subducting young, hot oceanic plate. B) is accumulating stress and elastic strain. C) continues no further North than Seattle, U.S.A. D) does not constitute an earthquake risk to Vancouver. E) is likely to produce large magnitude earthquakes but is too far from the coast for the effects to be felt on land.
7. If you are indoors during an earthquake, the best thing to do is A) Run outside. B) Duck under a sturdy table or desk. C) Call emergency services. D) Use a car to escape. E) Stand close to a window.
8. Which statement is TRUE? A) Earthquake magnitude and intensity are the same thing. B) Earthquake magnitude refers to how an earthquake affects people. C) Earthquake intensity is a measure of the size of the earthquake. D) The Modified Mercalli Scale gives a description of earthquake magnitude. E) An earthquake has a single magnitude and a range of possible intensities.
9. During an earthquake, a city built on thick lake sediments is likely to experience A) amplified seismic waves. B) accelerated seismic waves. C) body waves only. D) a reduced risk of liquefaction. E) surface waves only.
10. An earthquake begins A) when rock begins to flow. B) at the epicenter. C) when seismic waves cause a fault to slip. D) due to ground rupture. E) when a fault slips due to stress overcoming the rocks' elastic limit.
11. Earth's carrying capacity
A) is a fixed hard limit on the maximum population that can be sustained on Earth.
B) depends mostly on birth and death rates, and NOT on available food, energy, or water.
C) is NOT fixed, because technical advances in food and energy production can always satisfy the needs of a growing population. D) is NOT fixed, but is also NOT unlimited, because technical advances can NOT always satisfy the needs of a growing population.
E) is NOT a concern anymore, because population growth has slowed.

12. Regarding population growth, the graph at right
- tells us what WILL happen in the future.
 - indicates that Earth's available resources are diminishing rapidly.
 - suggests that medical advances will continue to reduce death rates worldwide.
 - suggests that population will level off at approximately the carrying capacity of Earth.
 - suggests that services and industrial output per person will continue to increase during your lifetime.



13. Suppose that your car ran out of gas. So you (1) push your car a distance of 200 m on a level road to the gas station, which takes you 10 minutes. (2) If you could have pushed your car with the same force across the same distance but over a longer time period (20 minutes), then
- you would have done more work for scenario (2) than scenario (1).
 - you would have done less work for scenario (2) than scenario (1).
 - the power associated with scenario (2) is less than for scenario (1).
 - the power associated with scenario (2) is greater than for scenario (1).
 - the potential energy increases when you push the car this distance.
14. A rock from the top of a mountain starts rolling downhill as a landslide. The further down it gets, the faster it goes. The dominant energy conversion is:
- kinetic energy into latent heat
 - potential energy into sensible heat
 - work into latent heat
 - kinetic energy into work
 - potential energy into kinetic energy
15. It takes LESS work to lift a 10 kg object 2 m on the Moon than it does on Earth. The reason is:
- the object has less mass on the Moon than on Earth.
 - the distance the object moved is measured relative to the diameter of the Moon.
 - (The question is not valid, because it would take the same amount of work.)
 - gravitational acceleration is less on the Moon than on Earth.
 - the moon has almost no atmosphere.
16. Which statement is TRUE?
- Stress is defined as the change of shape or deformation of a solid object.
 - Liquids are called fluids because they are very compressible.
 - Fluids with higher viscosity flow easier.
 - The present doubling time for Earth's population is 200-300 years.
 - The Earth's population is presently growing at a nearly linear rate.
17. In the domain given here, the most abundant element (by mass) is:
- nickel in the Earth's core
 - oxygen in the atmosphere
 - aluminum in the Earth's crust
 - hydrogen in the ocean
 - oxygen in the Earth's crust
18. Suppose $X = 5 \times 10^6$ km, and $Y = 50 \times 10^4$ Mm. Which statement is TRUE?
- Y is one order of magnitude greater than X.
 - X is two orders of magnitude greater than Y.
 - Y is two orders of magnitude greater than X.
 - X is three orders of magnitude greater than Y.
 - Y is three orders of magnitude greater than X.
19. Which is TRUE regarding stratification?
- Stratification does NOT mean layering.
 - Heavier objects sink through lighter fluids.
 - Smaller objects float on larger objects.
 - More-massive objects sink through fluids that are less massive.
 - Less-dense objects float on denser fluids.

20. Suppose that during 200 years of record, a tornado of intensity 2 happened 50 times. The return period is
 A) 4 years B) 25 years C) 50 years D) 100 years E) 200 years
21. Which statement is TRUE?
 A) Stress is NOT related to the creation of faults. B) Faults always result from compression.
 C) After multiple earthquakes, movement along a fault rarely exceeds one centimeter. D) Faults are the point of origin for most earthquakes that are strong enough to be felt. E) Faults result from plastic deformation.

22. Under increasing strain, rocks undergo 3 types of strain. These are
 A) elastic, reverse, strike-slip.
 B) plastic, brittle, elastic.
 C) compression, brittle, normal.
 D) elastic, brittle, transversal.
 E) plastic, brittle, reverse.

23. The rock formation shown in the image to the right
 A) is the result of plastic deformation.
 B) formed as a result of an earthquake.
 C) is a reverse fault.
 D) provides evidence of brittle strain.
 E) is the result of tension forces.



24. At a convergent plate boundary,
 A) subduction always occurs.
 B) tectonic forces are transversal.
 C) the smallest magnitude earthquakes occur.
 D) intraplate earthquakes occur. E) the largest magnitude earthquakes occur.

25. Which statement is TRUE?
 A) Rayleigh waves generally cause little destruction. B) S waves are surface waves. C) P waves can move through fluids. D) Surface waves travel faster than body waves. E) S waves are the fastest body waves.
26. Why do earthquakes in developing countries usually result in much more casualties than earthquakes in developed countries?
 A) Earthquakes occur at a shallower depth in undeveloped countries. B) Undeveloped countries are smaller than developed countries, therefore earthquakes happen closer to urban areas. C) Undeveloped countries are more likely to be hit by earthquake-triggered tsunami and landslides. D) Developed countries generally have more rigorous building regulations and more resources to build earthquake resistant buildings. E) Developed countries' citizens are much better educated about earthquake risks.

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