

Instructions: Closed book. 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 exam packet (A). Please indicate (A) in the "Test Form" column on your Scantron sheet.

RULES:

1. Each student must be prepared to produce, upon request, a UBC card for identification.
2. Students suspected of any of the following, or similar, dishonest practices shall be immediately dismissed from the examination and shall be liable to disciplinary action:
 - having at the place of writing any books, papers or memoranda, calculators, computers, sound or image players/recorders/transmitters (including telephones), or other memory aid devices, other than those authorized by the examiners;
 - speaking or communicating with other candidates;
 - purposely exposing written papers to the view of other candidates or imaging devices. The plea of accident or forgetfulness shall not be received.
3. Students must hand in all midterm materials.

You have 50 minutes

- 1) In correct order from center outward, Earth includes which units?
- A. Core, inner mantle, outer mantle, crust, asthenosphere
 - B. Inner core, crust, mantle, hydrosphere
 - C. Core, crust, mantle, hydrosphere
 - D. Inner core, outer core, mantle, crust
 - E. Core, Inner Mantle, Outer Mantle, Crust, Asthenosphere
- 2) Boundaries between the layers of the Earth are frequently marked by . . .
- A. Changes in density
 - B. Changes in material properties
 - C. Changes in composition
 - D. All of the above
- 3) Which of the following best defines a mineral and a rock?
- A. A rock has an orderly, repetitive, geometrical, internal arrangement of minerals; a mineral is a lithified or consolidated aggregate of rocks.
 - B. A mineral consists of its constituent atoms arranged in a geometrically repetitive structure; in a rock, the atoms are randomly bonded without any geometric pattern.
 - C. In a mineral the constituent atoms are bonded in a regular, repetitive, internal structure; a rock is a lithified or consolidated aggregate of different mineral grains.
 - D. A rock consists of atoms bonded in a regular, geometrically predictable arrangement; a mineral is a consolidated aggregate of different rock particles.
 - E. A rock is made up of a geometrically repetitive arrangement of minerals that can only form from the crystallization of a magma
- 4) Granite and gabbro _____.
- A. have a similar mineral composition
 - B. have a similar texture
 - C. form from similar magmas
 - D. both A and B
 - E. are in no way similar
- 5) Which one of the following statements is not true?
- A. Mafic rocks can be enriched with Calcium relative to Sodium
 - B. Felsic rocks are enriched in iron and magnesium
 - C. Felsic Rocks are enriched in silica
 - D. Olivine, pyroxene and plagioclase are common in mafic rocks
 - E. Quartz, muscovite and plagioclase are common in felsic rocks
- 6) Which of the following sedimentary rocks would form in a high-energy environment?
- A. Conglomerate
 - B. Sandstone
 - C. Mudstone
 - D. Slate

7) _____ represent massive, gently sloping volcanoes built of successive, basaltic lava flows

- A. shield volcanoes
- B. composite/stratovolcanoes
- C. cinder cones
- D. calderas
- E. domes

8) Which one of the following shows the correct order (left to right) of decreasing magma viscosity?

- A. rhyolite, andesite, basalt
- B. andesite, rhyolite, basalt
- C. basalt, rhyolite, andesite
- D. basalt, andesite, rhyolite
- E. granite, andesite, rhyolite

9) A _____ is the largest, discordant body of intrusive, igneous rock.

- A. lopolith
- B. laccolith
- C. pluton
- D. batholith
- E. Sill

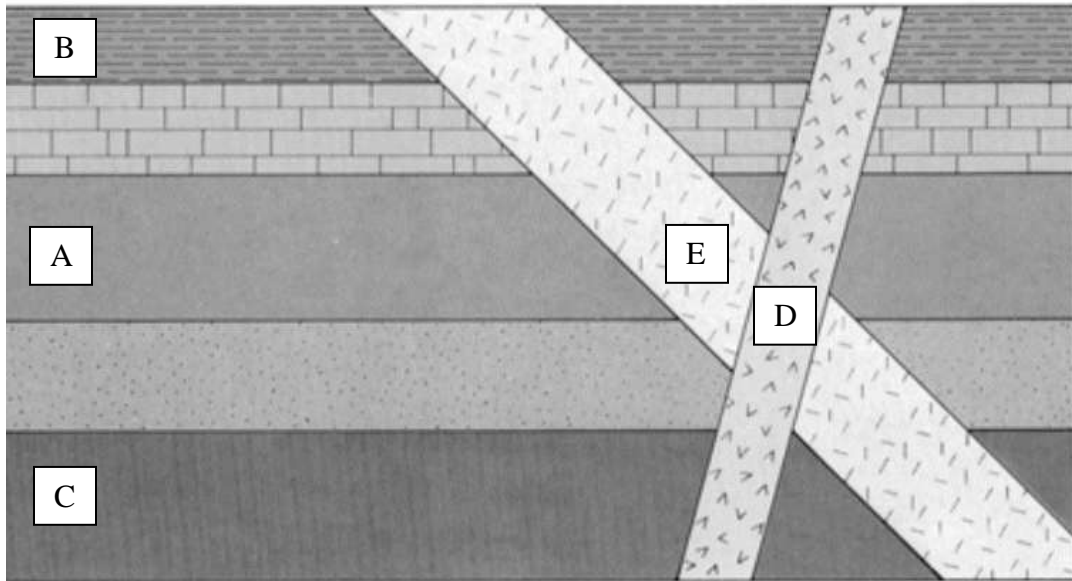
10) Clay minerals formed from intrusive igneous rocks illustrate which kind of weathering?

- A. chemical
- B. particulative
- C. frost wedging
- D. mechanical
- E. compactive

11) Which one of the following statements concerning mechanical weathering is not true?

- A. reduces grain sizes of rock particles
- B. allows for faster rates of chemical weathering
- C. is important in the formation of talus slopes
- D. cannot proceed without chemical weathering
- E. can be facilitated by activity of living organisms

Use the cross section below to answer the following questions.



12) Which feature is the youngest? _____

13) Which feature is the oldest? _____

14) The half-life of carbon-14 is about 6000 years. Assume that a sample of charcoal is formed by burning of living wood 15,000 years ago. How much of the original carbon-14 would remain today?

- A. more than one-half
- B. between one-fourth and one-eighth
- C. between one-half and one-fourth
- D. between one-half and one-third
- E. None

15) Sandstone strata and a mass of granite are observed to be in contact. Which of the following statements is correct geologically?

- A. The sandstone is younger if the granite contains sandstone inclusions.
- B. The sandstone is younger if it shows evidence of contact metamorphism.
- C. The granite is older if the sandstone contains pebbles of the granite.
- D. The granite is older if it contains inclusions of sandstone.
- E. The contact represents an erosional event

16) The _____ occurs before the _____ and after the _____.

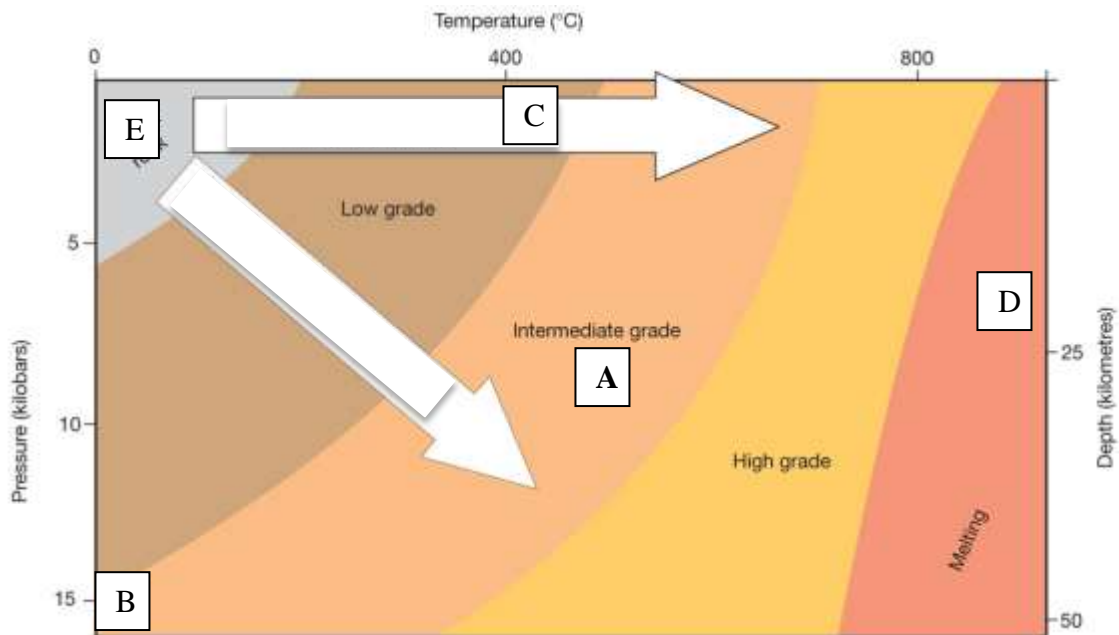
- A. Cretaceous, Triassic, Jurassic
- B. Jurassic, Permian, Cambrian
- C. Cambrian, Ordovician, Silurian
- D. Silurian, Devonian, Ordovician
- E. Permian, Carboniferous, Triassic

17) Sedimentary rocks form _____ from _____

- A. At the surface of the Earth, products of weathering
- B. At the bottom of the ocean, products of mechanical weathering
- C. Anywhere in the crust, bioclastic material
- D. Quickly, cementation
- E. Slowly, frost wedging

18) Which of the following plays a large role in the formation of igneous, sedimentary and metamorphic rocks?

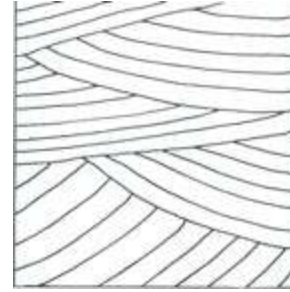
- A. Pressure
- B. Temperature
- C. Mechanical Weathering
- D. Fractional crystallization
- E. Cementation



19) In the above diagram, which point represents conditions that would produce a schist?

20) The illustration at right depicts an important structure found in some rocks. What can it tell you?

- A. Deformation has occurred
- B. Wind helped form the rocks
- C. Water helped form the rocks
- D. Material was deposited by a changing current
- E. Organisms deformed the material after deposition



21) Which of the following would be considered the driving force of mass wasting events?

- A. Gravity
- B. Water
- C. Vegetation
- D. Cohesion
- E. The angle of repose

22) Which of the following could not be part of a magma?

- A. Ash
- B. Water Vapor
- C. Gas
- D. Feldspar crystals
- E. Melt

23) Which of the following statement about quartz is true?

- A. Quartz has a higher melting point than olivine
- B. Quartz is less resistant to weathering than Amphibole
- C. Quartz is composed of silica tetrahedral
- D. Quartz only forms in igneous rocks
- E. Quartz is depleted as magmas cool

24) You are given a Metamorphic rock. From what previous rock type did it form?

- A. metamorphic
- B. igneous
- C. metamorphic, igneous, or sedimentary
- D. sedimentary
- E. none: metamorphic rocks form within the Earth

25) Volcanoes are present at convergent plate boundaries because

- A. the plates rub together, causing friction and heat.
- B. cracks formed from compression allow migration of material from the liquid mantle
- C. water is carried down with the subducting plate and causes the mantle to melt.
- D. heat from the inner mantle travels up along the subducting plate.
- E. decompression melting due to decreased pressure at the boundary causes the mantle to melt and rise into volcano formations.

26) A compressional stress is applied to rocks behaving plastically at depth. As these rocks near the surface, they are again deformed, this time by a tensional stress. Which of the following combinations would you most likely observe when seeing these rocks after they have finally been exposed?

- A. An overturned anticline
- B. An asymmetrical syncline
- C. A faulted syncline with the footwall having moved down relative to the hanging wall
- D. A faulted anticline with the footwall having moved down relative to the hanging wall
- E. An overturned anticline cut by faulting and joints

27) Which of the following structures could not form from a compressional stress?

- A. Reverse fault
- B. Graben
- C. Thrust fault
- D. Anticline
- E. Syncline

28) Which of the following types of deformation structures has a horizontal axial plane?

- A. overturned fold
- B. asymmetric fold
- C. recumbent fold
- D. plunging fold
- E. pleaberation

29) Read carefully through the following sentence, and decide which of the options is correct. Most mountain belts form near convergent plate boundaries where crust thickens by tensional shortening and by intrusion and crystallization of magma.

- A. The word "tensional" should be replaced by "compressional."
- B. The word "convergent" should be replaced by "divergent."
- C. The word "near" should be replaced by "far from."
- D. The word "crust" should be replaced by "mantle."
- E. The word "convergent" should be replaced by "divergent."

30) The figure below shows which type of mass movement?

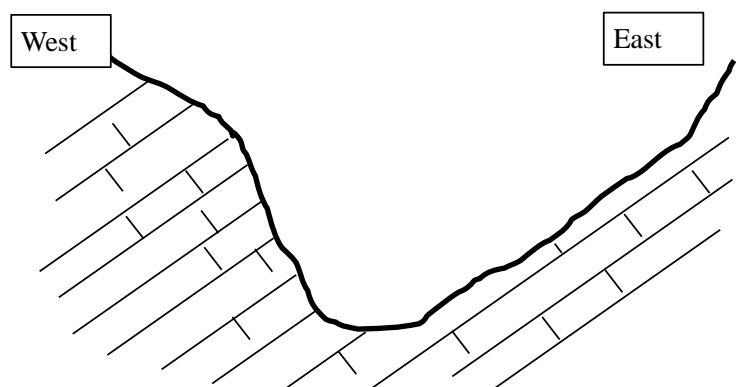
- A. a complex movement
- B. a fall
- C. a slide
- D. a flow



31. Over geologic time, what has caused the glacial ages?

- A. changes in the atmosphere
- B. changes in the positions of the continents
- C. changes in the Earth's orbit
- D. All of the above have contributed to the glacial ages.
- E. The cause is unknown at this time.

32) For the valley shown in cross section at right, the most likely slope failure modes originating from the western (W) and eastern (E) slopes would be _____. Assume material is weathered bedrock.



- A. rockfalls (W) and slides (E)
- B. rockfalls (W) and flows (E)
- C. translational slides (W) and rockfalls (E)
- D. rotational slides (W) and translational slides (E)
- E. translational slides (W) and rotational slides (E)

33) Which of the following statements about Earth's resources is false?

- A. The human species will eventually run out of water
- B. The human species will eventually run out of fossil fuels
- C. Oil forms from algae
- D. Coal forms from plants
- E. Most ore deposits are associated with magmatic bodies

34) Under what conditions is a sediment considered to be well-sorted?

- A. when the grains are in individual layers
- B. when the grains contains a wide variety of grain sizes mixed together
- C. when the grains contains just one general grain size and one mineral
- D. when the grains are nearly all the same size
- E. when the grains contain just one or two general grain sizes

35) The removal of a great weight of rock above a batholith by erosion allows the granite to expand, forming _____.

- A. weathering rinds
- B. hydrothermal veins
- C. faults
- D. cooling fractures
- E. sheet joints

36) _____ metamorphism occurs adjacent to a pluton when a body of magma intrudes a relatively cool country rock.

- A. Regional
- B. Contact
- C. Sedimentary
- D. Igneous
- E. Burial

37) The melting point of a mineral generally _____ with increasing pressure (or depth).

- A. does not change
- B. increases
- C. decreases
- D. is unknown
- E. becomes dependent on rock type

38) The mineral ___ reacts with weak hydrochloric acid to produce carbon dioxide gas, i.e., it effervesces (fizzes) in dilute acid.

- A. biotite
- B. amphibole
- C. calcite
- D. quartz
- E. feldspar

39) Young mountain belts with their associated igneous intrusions, metamorphism, and fold-thrust belts form at _____.

- A. divergent boundaries
- B. continental rifts
- C. transform fault boundaries
- D. convergent boundaries
- E. hot spots

40) A stream's discharge is ___.

- A. the volume of dissolved mineral matter carried by the stream in a unit of time
- B. the volume of solid sediment carried by the stream in a unit of time
- C. the volume of water passing through a specific point along the stream in a unit of time
- D. the volume of excess water during flood stage
- E. the average amount of water in the entire stream system