Geology · Biology and Earth Sciences

Science of Geology and Earth Materials, Components of Planet Earth

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83	3	31
questions	sets	pages

Contents

Multiple choice questions (54 questions) — Questions · p. 2 — Answers · p. 23

Essay questions (5 questions) — Questions · p. 15 — Answers · p. 27

Past exam questions (24 questions) — Questions · p. 17 — Answers · p. 28

Click a question number to jump to its answer, and an answer number to go back to the question.

Multiple choice questions — 54 questions

1 The science that studies the environmental conditions in which coal formed in Sinai and shows the ancient climate of this region is .....

(A) geophysics
(B) palaeontology (fossils)
(C) geochemistry
(D) mineralogy and crystallography

2 Landmines were planted under the soil in the El Alamein area during World War II. Which branch of geology was used to detect the locations of these mines?

(A) Geophysics
(B) Geochemistry
(C) Groundwater geology
(D) Mineralogy and crystallography

3 The science that studies how much pressure the rocks of an area can withstand, to decide whether buildings can be built on them, is .....

(A) geochemistry
(B) geophysics
(C) structural geology
(D) engineering geology

4 Nuclear physicists are interested in searching for minerals rich in radioactive elements in rocks, which uses geology in the field of .....

(A) agriculture
(B) energy
(C) construction and building
(D) searching for groundwater

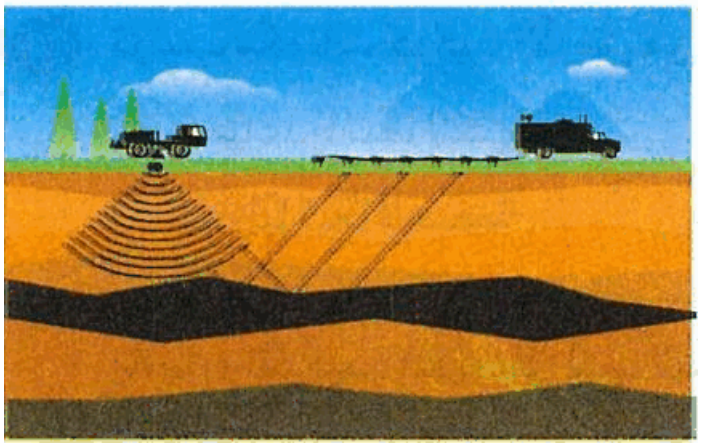
5 The age of a layer of organic limestone rock is determined by studying .....

(A) its chemical composition
(B) its mineral composition
(C) the place where it was deposited
(D) the fossils in it

6 A branch of geology through which it was concluded that sedimentary rocks are deposited horizontally from the oldest to the youngest is .....

(A) petroleum geology
(B) geophysics
(C) stratigraphy
(D) physical geology

7 The opposite figure shows a device used to detect the locations of energy sources under the Earth's surface through the science of .....



(A) geochemistry
(B) geophysics
(C) stratigraphy
(D) engineering geology

8 The science that studies the maturation of organic matter needed to generate energy is .....

(A) engineering geology
(B) geochemistry
(C) geophysics
(D) petroleum geology

9 The basic branch of geology we depend on to infer the nature of the environment in which primitive fishes lived in the past is .....

(A) mineralogy and crystallography
(B) palaeontology (fossils)
(C) geochemistry
(D) geophysics

10 The percentages of the eight chemical elements that make up about 98.5 % of the weight of the Earth's crust are inferred by studying .....

(A) physical geology
(B) structural geology
(C) geophysics
(D) geochemistry

11 The science that studies the physical and chemical properties of gold is .....

(A) physical geology
(B) mineralogy and crystallography
(C) engineering geology
(D) structural geology

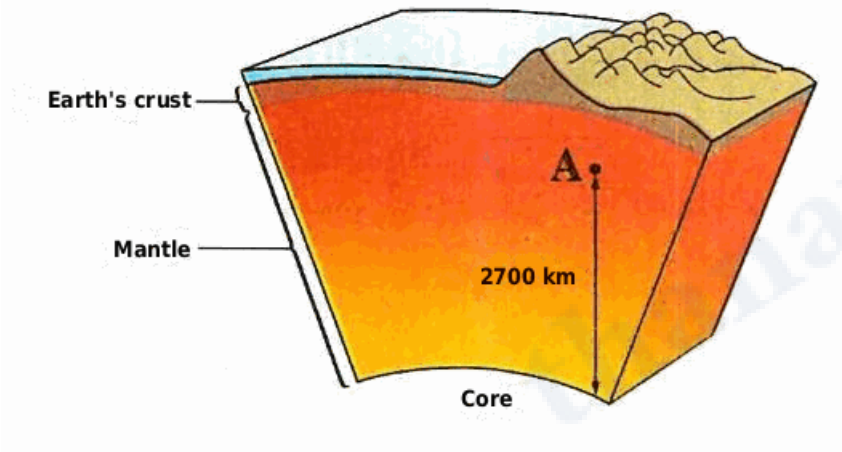
12 The science that studies the effect of lakes, earth movements and rain on rocks is .....

(A) stratigraphy
(B) geochemistry
(C) groundwater geology
(D) physical geology

13 Geology helps in fighting some agricultural pests by searching for .....

(A) gypsum and marble
(B) sulphur and chlorine
(C) copper and clay
(D) limestone and clay

14 The opposite model shows a section of the Earth. The depth from the bottom of the Earth's crust to point (A) is about .....



(A) 350 km
(B) 2600 km
(C) 2900 km
(D) 200 km

15 The order of the Earth's components from the outside to the inside is .....

(A) ascending according to density
(B) ascending according to the percentage of silica
(C) descending according to pressure
(D) descending according to temperature

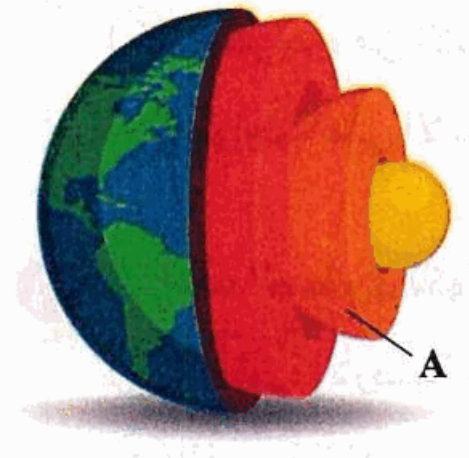
16 The chemical composition of the inner core and the upper mantle is similar in containing .....

(A) iron
(B) magnesium
(C) nickel
(D) silica

17 The floor of the Atlantic Ocean mostly contains rocks rich in .....

(A) silica and aluminium
(B) aluminium and magnesium
(C) silica and magnesium
(D) potassium and magnesium

18 The opposite model represents the Earth's zones. Which choice best describes the components of zone (A)?



(A) Rich in solid metals
(B) Rich in molten metals
(C) Rich in solid silicates
(D) Rich in fluid silicates

19 A zone in the Earth whose diameter is about 6972 km is .....

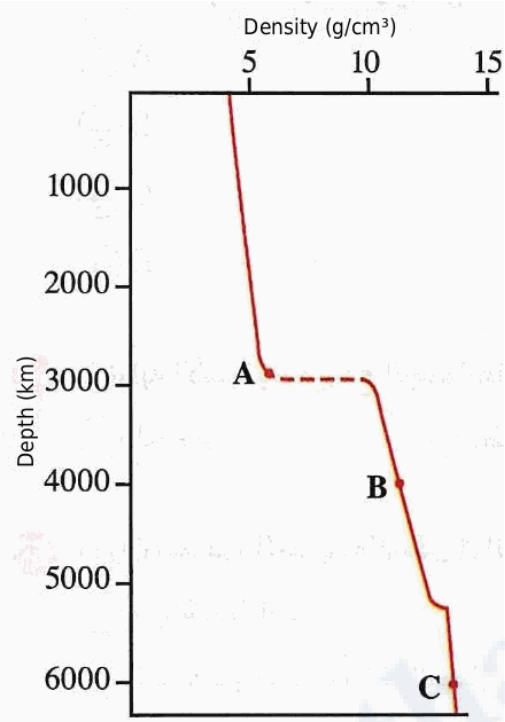
(A) the mantle
(B) the core
(C) the outer core
(D) the lithosphere

20 The element that is rare in the mantle and is one of the reasons for the increased density of the Earth's core is .....

(A) nickel
(B) magnesium
(C) silicon
(D) iron

21 The opposite graph shows the relation between the density of rocks and depth inside the Earth. Study it well, then answer:

Which of the following choices explains the reason for the sudden change in density at point (A)?



(A) The rotation of solid iron and nickel in the outer core around the molten inner core

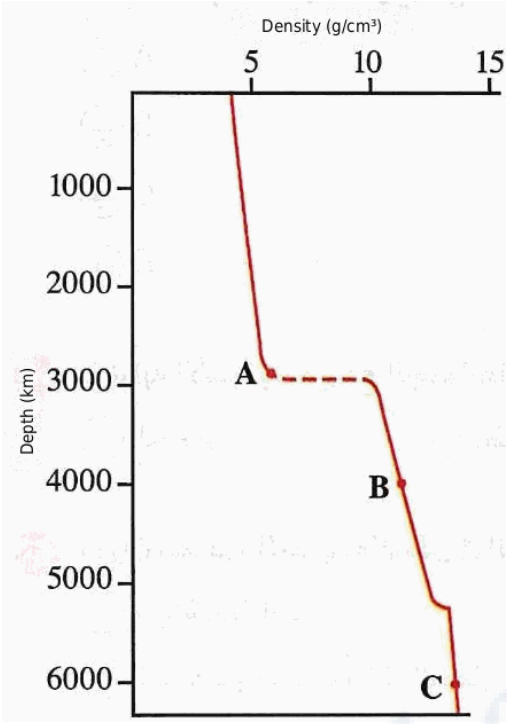
(B) The outer core is made of molten materials, while the mantle is made of plastic fluid materials

(C) The reversal of the Earth's magnetic field through the inner core

(D) The density of the iron and nickel forming the core is much higher than the density of the iron and magnesium silicates forming the mantle

22 The opposite graph shows the relation between the density of rocks and depth inside the Earth. Study it well, then answer:

The temperature at point (B) is about .....



(A) 1200 °C (B) 3100 °C (C) 4500 °C (D) 5200 °C

23 The zone that makes up about 1 % of the Earth's volume is .....

(A) the Earth's crust (B) the asthenosphere
(C) the whole mantle (D) the Earth's core

24 The average thickness of the rocks of the Earth's crust under open seas and oceans is about .....

(A) 10 km (B) 50 km (C) 60 km (D) 150 km

25 The rocks of continents differ from the rocks of oceans in all of the following except .....

(A) specific gravity (B) density (C) thickness (D) physical state

26 When studying the different components of the Earth, which of the following choices is correct about the lithosphere?

(A) It is part of the asthenosphere (B) It lies below the outer core
(C) It lies above the asthenosphere (D) It is part of the inner core

27 The Earth's rocky shell (lithosphere) includes .....

(A) the Earth's crust and the upper part of the mantle

(B) the lower part of the Earth's crust and the asthenosphere

(C) the continental crust and the whole mantle

(D) the oceanic crust and the whole mantle

28 The main components of the lower mantle are .....

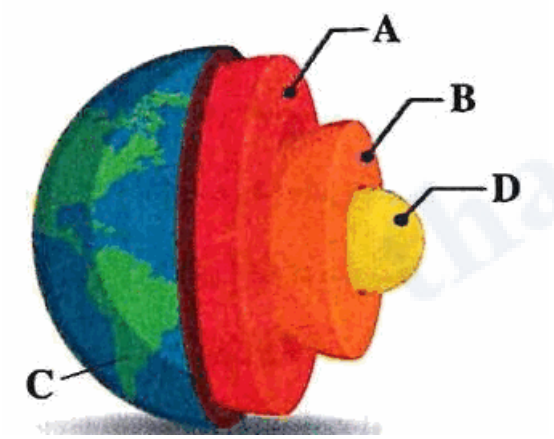
(A) silica, sodium and potassium

(B) iron, potassium and magnesium

(C) iron, calcium and potassium

(D) silica, iron and magnesium

29 The opposite model represents different zones of the Earth. Which letter most accurately represents sial rocks?



30 The asthenosphere is similar to the upper part of the mantle in .....

(A) volume

(B) pressure

(C) physical state

(D) chemical composition

31 The rotation of molten iron and nickel in the Earth's outer core is the reason for .....

(A) the movement of continents

(B) the origin of the Earth's magnetic field

(C) the spreading of convection current eddies

(D) the balance between oceanic and continental crust

32 The zone with the greatest density among the following is .....

(A) the outer core (B) the inner core (C) the mantle (D) the oceanic crust

33 Which of the following choices describes the mantle?

(A) Its lower part is plastic and fluid

(B) It is made of iron and nickel

(C) It is the largest zone of the Earth in volume

(D) It is made of igneous, sedimentary and metamorphic rocks

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34 How correct are the following two statements: «The continental crust is thicker than the oceanic crust», «The oceanic crust is less dense than the continental crust»?

(A) Both statements are correct

(B) The first statement is correct and the second is wrong

(C) Both statements are wrong

(D) The first statement is wrong and the second is correct

---

35 In front of you is a section of the Earth with a borehole used to collect rock samples from a depth of 10 km below the Earth's surface. These rock samples belong to .....



(A) the Earth's crust

(B) the outer core

(C) the asthenosphere

(D) the lower mantle

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36 When studying a section of the Earth, solid rocks of iron and magnesium silicates are expected to be found at a depth of about .....

(A) 80 km (B) 200 km (C) 3500 km (D) 5050 km

---

37 Which of the following statements is correct about the Earth's zones?

(A) Pressure and density increase as depth increases

(B) Density decreases as depth increases

(C) Temperature decreases as depth increases

(D) Hardness increases as depth increases

---

38 The temperature and pressure in the region below the mantle are expected to be about .....

(A) 3500 °C and 0.4 million atmospheres

(B) 3500 °C and 3 million atmospheres

(C) 5200 °C and 0.4 million atmospheres

(D) 5200 °C and 3 million atmospheres

---

39 The zone found inside the Earth at a depth of 3500 km is believed to be .....

(A) molten at a temperature of about 4400 °C

(B) solid at a temperature of about 4400 °C

(C) molten at a temperature of about 5400 °C

(D) solid at a temperature of about 5400 °C

---

40 The balance between the oceanic and continental crust is due to the fact that the continental crust is .....

(A) thicker and less dense

(B) thinner and less dense

(C) thinner and denser

(D) thicker and denser

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41 The volume of the zone made of the three types of rocks, relative to the Earth's volume, is about .....

(A) 1 %

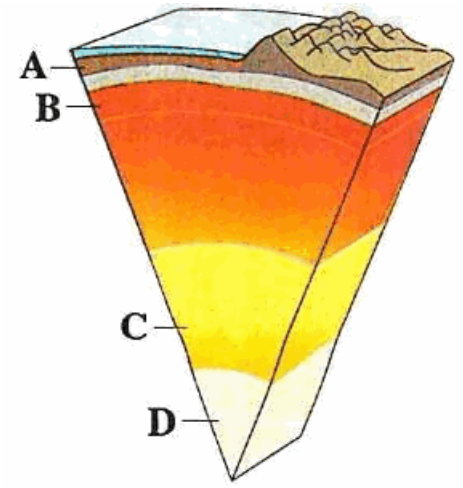
(B) 15 %

(C) 33 %

(D) 84 %

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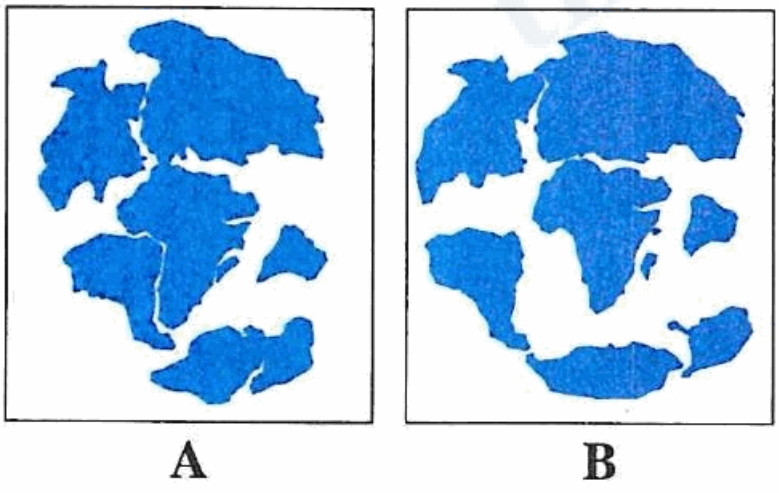
42 In front of you is a model of a section of the Earth, and the letters (A), (B), (C), (D) represent four different zones. Which zone contains plastic fluid rocks?



43 At a depth of 5500 km below the Earth's crust, the physical state is .....

(A) solid (B) liquid (C) gas (D) plastic

44 The two maps (A) and (B) show the positions of the continents during different periods of time. The change in the positions of the continents is due to .....



(A) the variation of temperature in the outer core

(B) the presence of the Earth's magnetic field

(C) the occurrence of convection current eddies in the mantle

(D) the occurrence of climate changes

45 The thickness of the non-solid part of the Earth's core is about .....

(A) 60 km (B) 1386 km (C) 2100 km (D) 2900 km

46 The sum of the volume percentages of the mantle and core rocks out of the volume of the Earth's rocks is about .....

(A) 50 % (B) 75 % (C) 97 % (D) 99 %

47 The Earth's outer core and inner core .....

(A) have equal densities and different thicknesses
(B) have different densities and equal thicknesses
(C) differ in thickness and physical state
(D) are the same in thickness and physical state

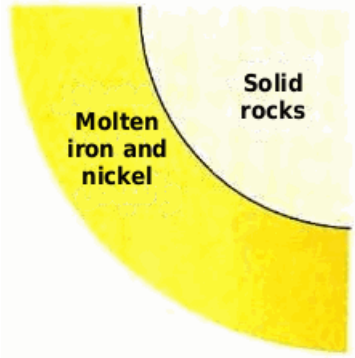
48 The zone at a depth of about 5100 km from the Earth's surface is made of .....

(A) silica and magnesium (B) silica and aluminium
(C) iron and magnesium (D) iron and nickel

49 The boundary between the outer core and the inner core is about ..... below the Earth's crust.

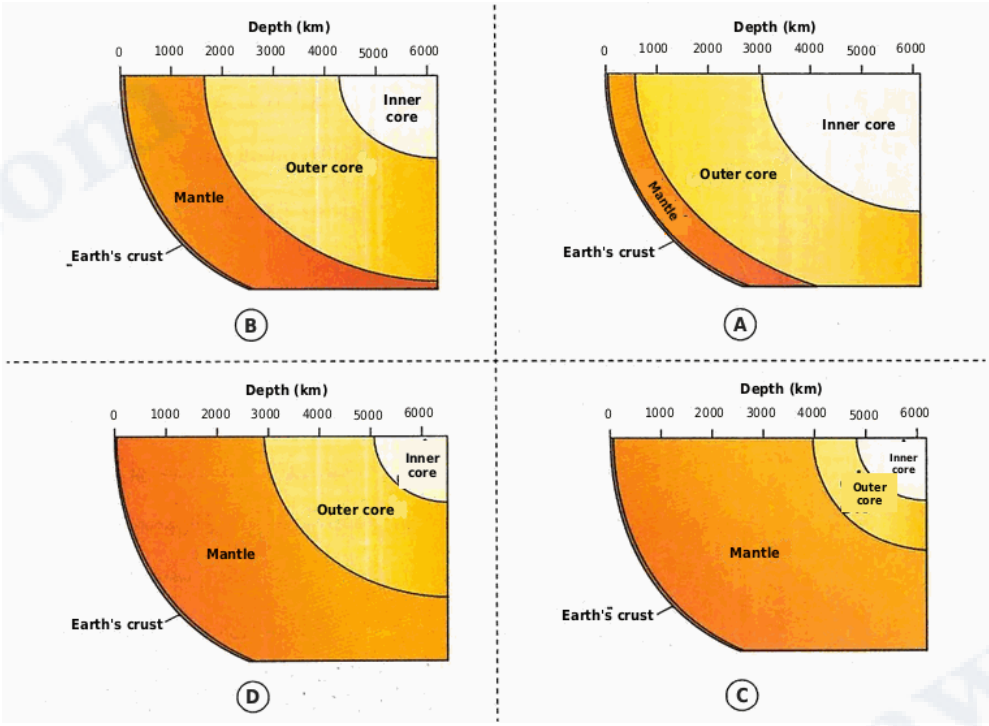
(A) 2900 km (B) 3486 km (C) 5000 km (D) 6386 km

50 In front of you is a section representing part of the Earth's structure. The physical state of the components of this section was inferred through .....



(A) seismic waves (B) the spreading of convection currents
(C) electromagnetic rays (D) studying rock samples

51 Which of the following sections represents the correct structure of the Earth's zones?



52 Which of the following did scientists use to collect evidence about the physical state of the Earth's core?

(A) Measuring the Earth's gravity with satellites

(B) Studying how earthquake waves travel through the Earth

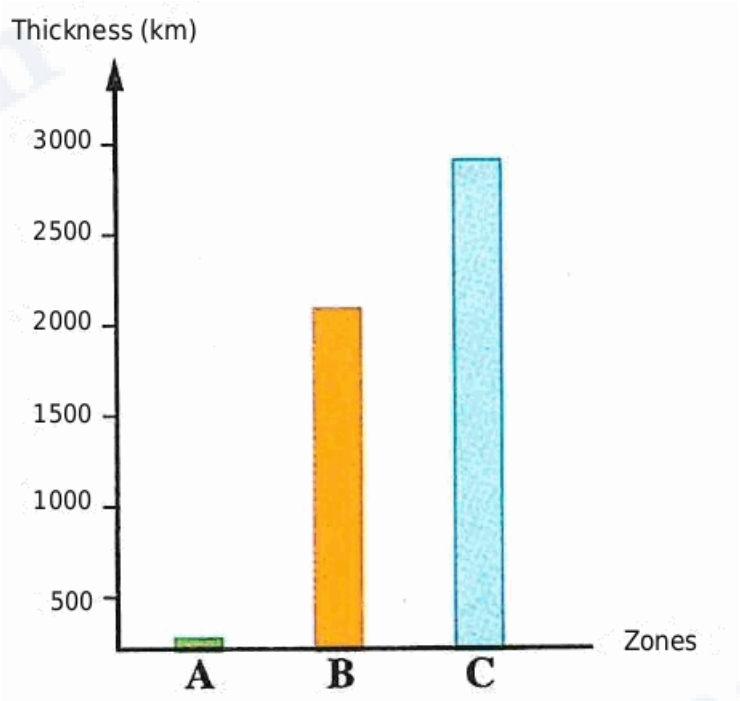
(C) Analysing measurements of the Earth's surface temperature

(D) Analysing the chemical composition of ancient meteorites

53 The pressure at a depth of 1500 km below the mantle is about .....

(A) 1 million atm (B) 2 million atm (C) 3 million atm (D) 4 million atm

54 The opposite graph represents the thickness of some of the Earth's zones. The correct order of these zones from the inside to the outside is .....



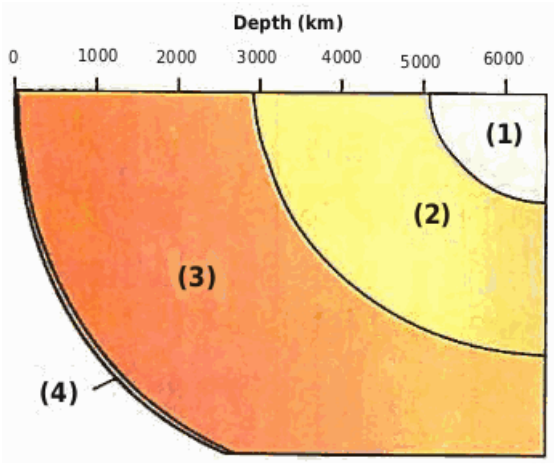
(A) A then B then C (B) B then C then A (C) C then B then A (D) A then C then B

Essay questions — 5 questions

1 The opposite figure shows a section of the Earth. From the figure, deduce the name and number of the zone that is characterized by the following:

(1) It is made of molten iron and nickel.

(2) Part of it contains fluid rocky materials that contribute to the movement of the continents above it.



2 «Geology has great importance through its different branches». In the light of this statement, state the branches of geology concerned with studying each of the following:

(1) The locations of mineral ores.

(2) The age of the rocks in which petroleum is stored.

(3) The percentages of the elements forming a sedimentary rock.

(4) The forms produced by the Earth's internal forces.

3 The properties of the continental crust differ from those of the oceanic crust. In the light of this, state:

(1) What physical properties distinguish the continental crust from the oceanic crust?

(2) What chemical properties distinguish the components of the oceanic crust from the continental crust?

4 The Earth is divided into several zones that are similar in some properties and different in others. Through this, state:

(1) One difference between the asthenosphere and the upper mantle.

(2) One similarity between the inner and outer core.

5 The Earth is made of different zones that differ in thickness, and each has a role that distinguishes it. In the light of this, state:

(1) Which zone caused the continent of Africa to move away from the continent of South America?

(2) In which of the Earth's zones is the pressure the greatest?

(3) What are the main rocks forming each of the continent of Asia and the floor of the Atlantic Ocean?

Past exam questions — 24 questions

1 Biology studies the evolution of some types of mammals depending on the science of ..... (Trial exam / May 2021)

(A) geochemistry
(B) stratigraphy
(C) geophysics
(D) palaeontology (fossils)

2 All of the following change the shape of the Earth's surface except ..... (Trial exam / June 2021, Sample exam 2025)

(A) the rotation of the outer core around the inner core
(B) temperature and pressure under the ground
(C) winds and floods
(D) rivers and lakes

3 How does geology contribute to solving the problem of overpopulation? (1st session 2022)

(A) Choosing safe areas to build new communities
(B) Searching for raw materials needed for industry
(C) Prospecting for the locations of mineral wealth
(D) Discovering energy sources

4 In which field is the contribution of geology to the production of fertilizers clear? (2nd session 2022)

(A) Energy
(B) Heavy industries
(C) Mining
(D) Chemical industries

5 Geology contributes to the following fields except ..... (Trial exam 2023)

(A) determining the percentages of raw materials in chemical industries
(B) determining the locations for building dams and digging tunnels
(C) prospecting for mineral ores
(D) discovering energy sources

6 Which branch of geology has a great effect in the field of industry by analysing the raw materials of some industries? (1st session 2023, Sample exam 2025)

(A) Petroleum geology
(B) Geophysics
(C) Geochemistry
(D) Structural geology

7 What is the role of geologists in the manufacture of fertilizers and pesticides? (2nd session 2023)

(A) Providing the raw materials needed for the industry
(B) Extracting potassium from quartz
(C) Providing silica from limestone
(D) Extracting iron from the mineral hematite

8 Most of the desert areas in the New Valley were turned into areas of agricultural production. Which science had the main role in this? (1st session 2024)

(A) Physical geology
(B) Groundwater geology
(C) Stratigraphy
(D) Structural geology

9 Geology has a role in searching for the energy sources needed to run different machines through the science of ..... (2nd session 2024)

(A) engineering geology
(B) physical geology
(C) stratigraphy
(D) geophysics

10 An Egyptian-Australian study of the Nubian mountains in the Eastern Desert proved that the rocks of this region contain economic amounts of gold. Which branch of geology is responsible for this study? (Sample exam, 1st session 2025)

(A) Mineralogy
(B) Structural geology
(C) Geochemistry
(D) Stratigraphy

11 3 different scientists, each a specialist in one of the following branches of geology (geophysics - geochemistry - mineralogy and crystallography), worked together to ..... (Sample exam 2026)

(A) search for coal in the Eastern Desert
(B) search for the mineral platinum near the southern border
(C) build an industrial facility near the Qattara Depression
(D) dig groundwater wells near the New Valley

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12 Wadi El Hitan (Valley of the Whales) in Fayoum Governorate has skeletons of ancient whales. Which branch of geology is not relied on to protect these skeletons? (Sample exam 2026)

(A) Physical geology
(B) Palaeontology (fossils)
(C) Structural geology
(D) Mineralogy and crystallography

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13 Many Egyptian scientists and engineers had a great role in the glorious October War of 1973, among them geologists who contributed greatly with their sciences in all of the following fields except ..... (Sample exam 2026)

(A) physical geology and its role in studying the battlefield and climatic effects
(B) groundwater geology to dig wells that the soldiers benefit from and set up camps next to them
(C) engineering geology to build tunnels where the soldiers hide
(D) geophysics to study the acceleration of vehicles on sand and the direction of wind

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14 Which of the following is not one of the importances of geology? (Sample exam 2026)

(A) Exploring natural resources such as oil and minerals
(B) Understanding the history of the Earth and the geological processes that took place in it
(C) Making use of groundwater in agriculture
(D) Predicting natural disasters such as earthquakes and volcanoes

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15 Two of the main components of the Earth behave like fluids and share the presence of iron in them, but the first has convection currents and the second has very high pressure. What are they, respectively? «Note that fluids are liquids and gases» (Sample exam 2025)

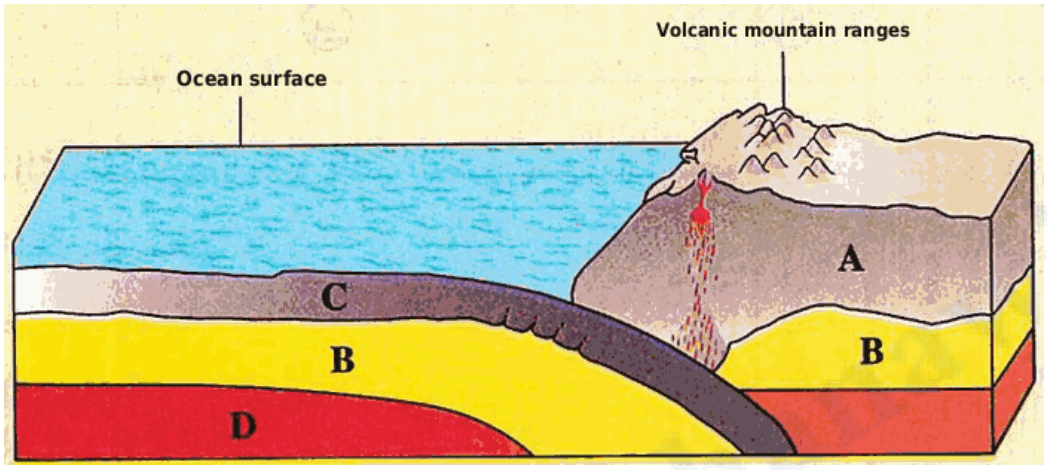
(A) Continental crust / inner core
(B) Asthenosphere / outer core
(C) Oceanic crust / outer core
(D) Asthenosphere / inner core

16 In which two of the Earth's zones is silica the most abundant component by percentage? (Sample exam 2025)

(A) The Earth's crust and the lithosphere
(B) The lower mantle and the outer core
(C) The inner core and the oceanic crust
(D) The inner core and the asthenosphere

17 In the following model, zones (A), (B), (C), (D) represent parts of the Earth's crust and mantle: (Sample exam 2025)

Which of the following statements correctly describes zones (A), (B), (C), (D)?

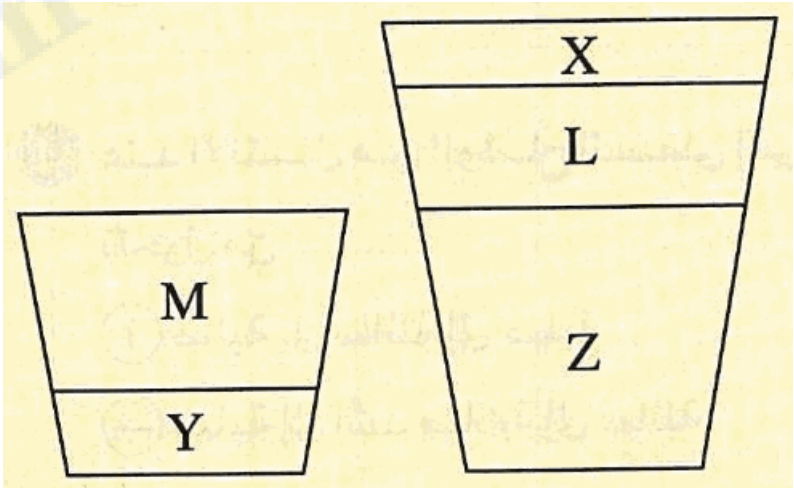


(A) Zone (B) is made of basaltic sima rocks, and zone (C) represents the solid rocks of the lithosphere
(B) Zones (A) and (B) represent the Earth's crust, and zones (C) and (D) represent the upper part of the mantle
(C) Zone (A) is made of granitic sial rocks, and zone (D) represents a fluid part of iron and magnesium silicates
(D) Zones (A) and (B) are made of solid rocks denser than the plastic fluid rocks of zones (C) and (D)

18 If the mass of the Earth's core is (X), then the mass of the Earth's crust and mantle together equals ..... (Sample exam 2025)

(A) 1/2 X
(B) 2 X
(C) 3 X
(D) 1/6 X

19 The two opposite figures show parts of the Earth's zones. (L) is responsible for the movement of the continents and (M) is responsible for the origin of the magnetic field. Which of the following choices is correct? (Sample exam 2025)



(A) (X) and (Y) have the same physical state

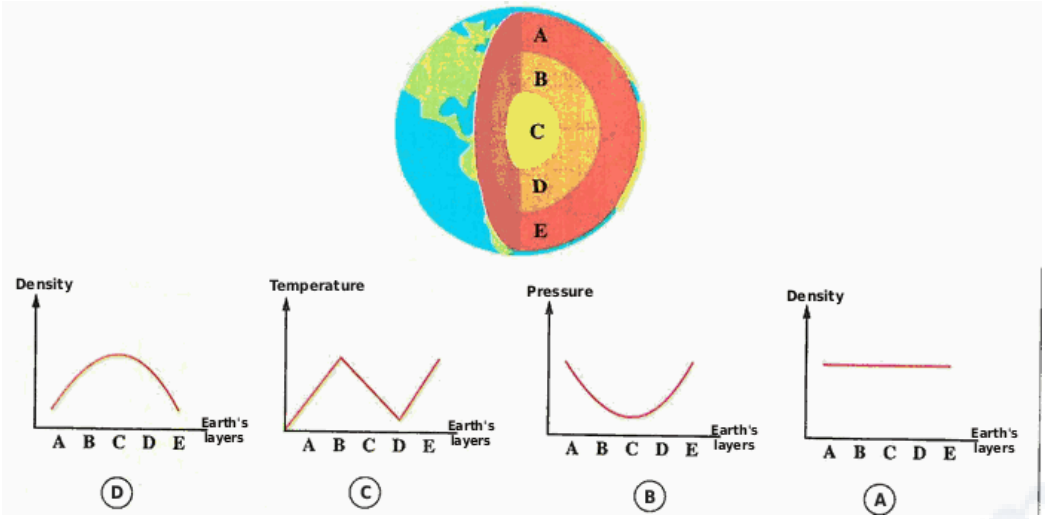
(B) (X) and (Y) have the same density

(C) Nickel enters the composition of (Z) and (Y)

(D) (Z) and (Y) have the same temperature

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20 Study the opposite figure, which shows the main components of planet Earth. Which of the following graphs is correct about the main components of planet Earth? (1st session 2025)



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21 What is the reason for the gradual increase in density inside the outer core as depth increases inside the Earth? (2nd session 2025)

(A) The increase in pressure acting on its components

(B) The gradual increase in temperature

(C) The change in chemical composition

(D) The presence of the Earth's magnetic field

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22 Which of the following Earth layers is made of rocky materials, although the extremely high temperature and pressure give it a plastic physical state that allows slow flow? (Sample exam 2026)

(A) The lithosphere

(B) The outer core

(C) The asthenosphere

(D) The oceanic crust

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23 Which of the following Earth zones is mainly responsible for generating the Earth's magnetic field? (Sample exam 2026)

(A) The continental crust and the mantle

(B) The mantle and the oceanic crust

(C) The outer core and the mantle

(D) The inner core and the outer core

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24 When moving from the lower mantle to the inner core, passing through the outer core, the physical state of matter changes from ..... (Sample exam 2026)

(A) solid to liquid to solid

(B) liquid to solid to liquid

(C) solid to harder to liquid

(D) plastic to liquid to solid

Answer key and solutions

Multiple choice questions

1 B	2 A	3 D	4 B	5 D	6 C	7 B	8 D	9 B	10 D
11 B	12 D	13 B	14 D	15 A	16 A	17 C	18 B	19 B	20 A
21 D	22 D	23 A	24 A	25 D	26 C	27 A	28 D	29 C	30 D
31 B	32 B	33 C	34 B	35 A	36 A	37 A	38 D	39 C	40 A
41 A	42 B	43 A	44 C	45 C	46 D	47 C	48 D	49 C	50 A
51 D	52 B	53 C	54 B						

1 **Answer (B)**

Palaeontology studies ancient organisms, and from them we infer the environment in which coal formed and the ancient climate.

2 **Answer (A)**

Geophysics detects buried metals and other objects by physical methods, including landmines.

3 **Answer (D)**

Engineering geology studies how well rocks can bear constructions.

4 **Answer (B)**

Searching for radioactive ores serves the field of nuclear energy.

5 **Answer (D)**

The fossils in the layer determine its age.

6 **Answer (C)**

Stratigraphy studies the order of sedimentary layers and their ages.

7 **Answer (B)**

The device sends waves and receives their reflection, which is one of the methods of geophysics.

8 **Answer (D)**

Petroleum geology studies how petroleum forms and how organic matter matures.

9 **Answer (B)**

Palaeontology studies ancient organisms and their environment.

This is choice (B).

10 **Answer (D)**

Geochemistry studies the chemical composition of the Earth and the percentages of its elements.

11 **Answer (B)**

Mineralogy and crystallography studies the properties of minerals such as gold.

12 **Answer (D)**

Physical geology studies the effect of erosion factors on rocks.

13 **Answer (B)**

Sulphur is one of the raw materials used in fighting agricultural pests.

14 **Answer (D)**

The thickness of the mantle is 2900 km, and point (A) is 2700 km from the core.

So the depth from the bottom of the crust is: $2900 - 2700 = 200$ km.

15 **Answer (A)**

The density of the Earth increases from the crust towards the core.

16 **Answer (A)**

17 **Answer (C)**

The floor of the Atlantic Ocean is oceanic crust, and its rocks are rich in silica and magnesium (sima).

18 **Answer (B)**

Zone (A) is the outer core, which is rich in molten metals.

19 **Answer (B)**

The core (outer core and inner core together) has a diameter of about 6972 km.

20 **Answer (A)**

21 **Answer (D)**

The density of iron and nickel in the core is much higher than the density of iron and magnesium silicates in the mantle.

So the density increases suddenly at the boundary between them.

22 **Answer (D)**

23 **Answer (A)**

The Earth's crust is thin and makes up about 1 % of the Earth's volume.

24 **Answer (A)**

25 **Answer (D)**

The rocks in continents and oceans are all solid, so they do not differ in physical state.

26 **Answer (C)**

The lithosphere is the crust with the upper part of the mantle, and it lies above the asthenosphere.

27 **Answer (A)**

The rocky shell includes the Earth's crust and the upper part of the mantle.

28 **Answer (D)**

The lower mantle is rich in silica, iron and magnesium.

29 **Answer (C)**

Sial rocks are the rocks of the continental crust, which is letter (C).

30 **Answer (D)**

31 **Answer (B)**

The rotation of molten iron and nickel in the outer core generates the Earth's magnetic field.

32 **Answer (B)**

The inner core is made of solid iron and nickel, and it is the densest zone of the Earth.

33 **Answer (C)**

The mantle is the largest zone of the Earth in volume.

34 **Answer (B)**

The continental crust is thicker, but the oceanic crust is denser than it.

35 **Answer (A)**

A depth of 10 km is less than the thickness of the Earth's crust.

36 **Answer (A)**

Solid rocks of iron and magnesium silicates are the solid upper part of the mantle within the lithosphere.

Its depth is about 80 km.

37 **Answer (A)**

Pressure and density increase as depth increases.

38 **Answer (D)**

Below the mantle the temperature is about 5200 °C and the pressure is 3 million atmospheres.

39 **Answer (C)**

A depth of 3500 km lies in the molten outer core.

40 **Answer (A)**

The continental crust is thicker and less dense than the oceanic crust, so balance is achieved between them.

41 **Answer (A)**

The crust is the zone made of the three types of rocks, and it makes up about 1 % of the Earth's volume.

42 **Answer (B)**

43 **Answer (A)**

The inner core is solid despite its high temperature because of the very high pressure, and it starts after a depth of about 5100 km.

44 **Answer (C)**

Convection currents in the mantle move the plates, so the positions of the continents change.

45 **Answer (C)**

The outer core is the non-solid part, and its thickness is about 2100 km.

46 **Answer (D)**

The crust makes up 1 % of the volume, so the mantle and core together make up 99 %.

47 **Answer (C)**

The outer core is molten with a thickness of 2100 km, and the inner core is solid with a thickness of 1386 km.

48 **Answer (D)**

At a depth of 5100 km the Earth's core starts, and it is made of iron and nickel.

49 **Answer (C)**

The boundary between the outer and inner core is at a depth of about 5000 km.

50 **Answer (A)**

Seismic waves change their speed according to the state of the rocks, so we infer the physical state from them.

51 **Answer (D)**

The mantle extends to a depth of 2900 km, the outer core to 5100 km, then the inner core to the centre.

52 **Answer (B)**

Secondary seismic waves do not pass through liquids, so how they travel reveals the state of the core.

53 **Answer (C)**

54 **Answer (B)**

The thickness of B is about 2100 km, so it is the outer core; the thickness of C is about 2900 km, so it is the mantle; and A is thinner, so it is the crust.

So the order from the inside to the outside is: B then C then A.

Essay questions

1 **Model answer**

(1) The outer core / (2).

(2) The mantle / (3).

2 **Model answer**

(1) Geophysics.

(2) Palaeontology (fossils).

(3) Geochemistry.

(4) Structural geology.

3 **Model answer**

(1) Thicker - less dense - lower specific gravity.

(2) It is made mostly of silica (about 45%) and magnesium.

4 **Model answer**

(1) Asthenosphere: its physical state is plastic and fluid. Upper mantle: its physical state is solid.

(2) The chemical composition of the outer and inner core: iron and nickel.

5 **Model answer**

(1) The asthenosphere.

(2) The core.

(3) The continent of Asia: granitic sial rocks. The floor of the Atlantic Ocean: basaltic sima rocks.

Past exam questions

1	2	3	4	5	6	7	8	9	10
D	A	A	D	A	C	A	B	D	C
11	12	13	14	15	16	17	18	19	20
B	D	D	C	B	A	C	B	A	D
21	22	23	24						
A	C	D	A						

1 **Answer (D)**

The evolution of organisms over time is studied from their remains and traces preserved in rocks, and this is the field of palaeontology.

2 **Answer (A)**

Temperature and pressure under the ground (internal forces) and winds, floods and rivers (external forces) change the shape of the Earth's surface.

The rotation of the outer core around the inner core produces the Earth's magnetic field.

3 **Answer (A)**

Geology helps in choosing geologically safe areas to build new urban communities that relieve overpopulation.

4 **Answer (D)**

Fertilizers are chemical industries, and geology provides their raw materials such as phosphate.

5 **Answer (A)**

Geology determines the locations for building dams and digging tunnels, prospects for ores and discovers energy sources.

Determining the percentages of raw materials in chemical industries is the work of chemists.

6 **Answer (C)**

Geochemistry studies the chemical composition of rocks and minerals, so it analyses the raw materials of industry.

7 **Answer (A)**

Geologists provide the raw materials (ores) needed for manufacturing fertilizers and pesticides.

8 **Answer (B)**

Reclaiming desert lands in the New Valley depends on searching for groundwater.

9 **Answer (D)**

Geophysics uses the physical properties of rocks to discover energy sources such as petroleum.

10 **Answer (C)**

Knowing the percentage of gold in the rocks of the region is a study of the chemical composition of rocks, which is the field of geochemistry.

11 **Answer (B)**

Geophysics, geochemistry and mineralogy work together in searching for mineral ores such as platinum.

12 **Answer (D)**

Protecting the skeletons depends on palaeontology to study them, and on physical and structural geology to study the factors and forces affecting the rocks containing them.

Mineralogy and crystallography is not related to this.

13 **Answer (D)**

Geophysics studies the physical properties of the Earth, not the acceleration of vehicles and the direction of wind.

14 **Answer (C)**

15 **Answer (B)**

The asthenosphere is a plastic rocky material that behaves like fluids and has convection currents that move the continents.

The outer core is a liquid of molten iron and nickel under very high pressure.

16 **Answer (A)**

Silica (SiO_2) is the most abundant component in the Earth's crust and the rocky shell (lithosphere).

17 **Answer (C)**

(A) is continental crust of granitic sial rocks, and (C) is oceanic crust.

(D) is the asthenosphere, a plastic fluid part of the mantle made of iron and magnesium silicates.

18 **Answer (B)**

The mass of the core is about one third of the Earth's mass, so the mass of the crust and mantle together is two thirds of the Earth's mass.

That is, twice the mass of the core = 2 X

19 **Answer (A)**

(X) is the crust, (L) the asthenosphere and (Z) the lower mantle; (M) is the outer core and (Y) the inner core.

The crust and the inner core are both solid.

20 **Answer (D)**

The section passes through the centre of the Earth: (A), (E) are the crust, (B), (D) the mantle and (C) the core.

Density increases towards the centre then decreases after it, so the curve has its peak at (C).

21 **Answer (A)**

Pressure increases with depth, so the components of the outer core are compressed and their density increases.

22 **Answer (C)**

The asthenosphere is a plastic rocky material that flows slowly because of the high temperature and pressure.

23 **Answer (D)**

The rotation of the liquid outer core around the solid inner core generates the Earth's magnetic field.

24 **Answer (A)**

The lower mantle is solid, the outer core is liquid and the inner core is solid.