Science 10

PROVINCIAL EXAM STUDY BOOKLET

Unit 4

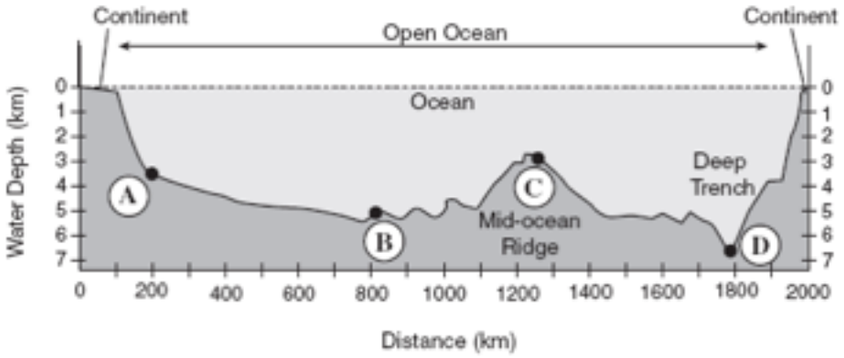
Earth Science

Student Instructions

1. Ensure that you have **blank paper** and a **Data Booklet**.
2. Record all answers on a separate piece of paper.
3. Answer keys are provided by your teacher.
4. When you have finished with this **Study Booklet** please return it to your teacher.

Make **NO MARKS** on this study booklet!

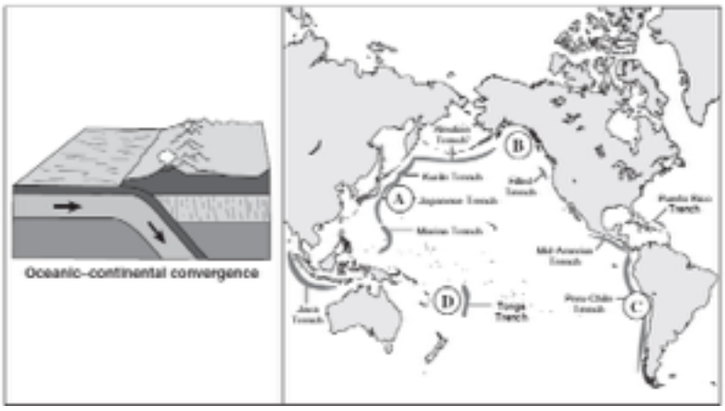
Use the following diagram to answer the next 2 questions.



1. Which location has the youngest crust?
   A. (A) B. (B) C. (C) D. (D)

2. Which location is associated with subduction?
   A. (A) B. (B) C. (C) D. (D)

Use the following diagram and map to answer the next 2 questions.



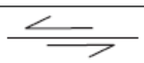
3. Where on the map does oceanic-continental convergence occur?
   A. (A) B. (B) C. (C) D. (D)

4. Which of the following would be associated with this type of plate boundary?

I	volcanism
II	deep earthquakes
III	volcanic island arc

A. I and II only B. I and III only C. II and III only D. I, II and III

5. Which of the following symbols indicates the presence of the subduction zone along the Pacific Coast of North America?

I	
II	
III	
IV	

A. II only B. I and II only C. II and III only D. I, II, III and IV

6. Which of the following explains the presence of a hot spot in the interior region of a continental plate?
   A. active subduction
   B. rising mantle magma
   C. transform fault plate boundary
   D. convergence of continental plates

Use the following diagram of the Pacific plate to answer the next question.

The lines on the diagram show the location of volcanic islands and submerged volcanoes from three hot spots on the floor of the Pacific Ocean.

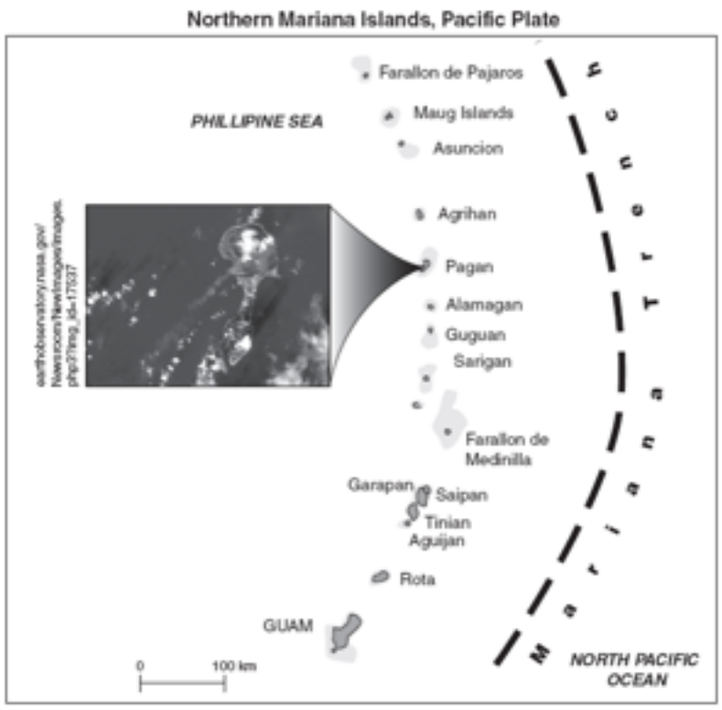
7. There is a change in direction in the line of submerged volcanoes which occurred 43 million years ago. Which of the following best explains the change?
   A. Pangaea broke apart.
   B. The Pacific plate changed direction.
   C. The Pacific plate developed a transform fault.
   D. A divergent plate boundary developed in the Pacific Plate

8. Which of the following were used as evidence to support Continental Drift Theory?

I	mountain chains separated by oceans
II	mirror-image seafloor magnetic reversal patterns
III	glacial deposits in locations too warm to have glaciers
IV	fossils on adjacent continents representing species which could not cross oceans
V	coals deposits in Antarctic regions too cold to support the necessary plant life

A. I and II only
B. III, IV and V only
C. I, III, IV and V only
D. I, II, III, IV and V

Use the following map of the Northern Mariana Islands in the Pacific Ocean to answer the next question.



9. Which of the following is correct?

I	The islands owe their origin to a hot spot.
II	Deep earthquakes occur along the island chain.
III	The Mariana Islands are an example of a volcanic island arc.
IV	The islands owe their origin to the subduction of an ocean plate.

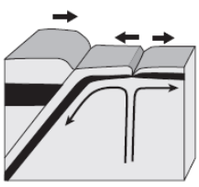
A. I only B. III and IV only C. I, II and III only D. II, III and IV only

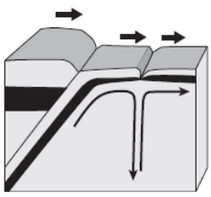
Use the following map to answer the question.

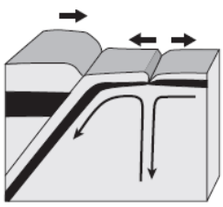
10. If the divergent plate boundary, X, within the continent of Africa and the divergent boundary, Y, in the Indian Ocean both continue to be active in the future, what is likely to occur between the two plate boundaries?

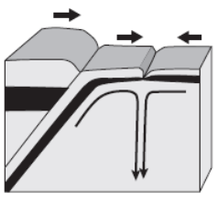
A. a rift valley B. a subduction zone
C. hot spot volcanoes D. a transform fault zone

11. Which of the following models correctly illustrates plate movement and mantle convection?

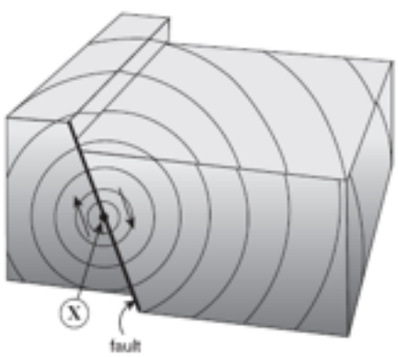
A. 

B. 

C. 

D. 

Use the following earthquake diagram to answer the next question.



12. What does X point to?

A. a focus B. a rift valley C. an epicentre D. a surface wave

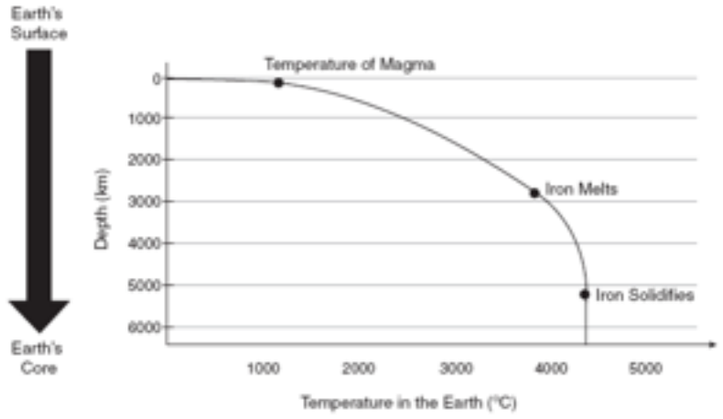
13. Which of the following correctly matches each plate boundary to a characteristic feature?

	Divergent Plate Boundary	Convergent Plate Boundary
A	mid-ocean ridges	rift valleys
B	continental comuntain chains	deep sea trenches
C	rift valleys	continental comuntain chains
D	volcanic island arcs	mid-ocean ridges

14. Which of the following explains why there are no volcanoes along the Denali fault that runs through Alaska and the Yukon?

A. It is a subduction zone.
B. It is an inactive hotspot.
C. There is no magma source.
D. It is a convergent plate boundary.

Use the following geothermal model of the Earth to answer the next 2 questions.



The geothermal model was constructed using seismic evidence and laboratory experiments of the properties of rock at different temperatures and pressures.

15. Using the geothermal model, identify the depth of the upper boundary of the Earth's outer core.

A. 200 km B. 2700 km C. 5200 km D. 6400 km

16. Why does melted iron become solid again at a depth of 5200 km?

A. Pressure increases.
B. Magnetism increases.
C. Temperature decreases.
D. Force of gravity decreases.

17. Which of the following is responsible for the movement of tectonic plates?

I	gravity
II	mantle convection
III	heat from radioactive decay

A. I and II only
B. I and III only
C. II and III only
D. I, II and III

Use the following map to answer the next question.

18. Which of the following correctly compares the processes occurring at X and Y?

	X	Y
A	slab pull	ridge push
B	slab pull	slab pull
C	ridge push	slab pull
D	ridge push	ridge push

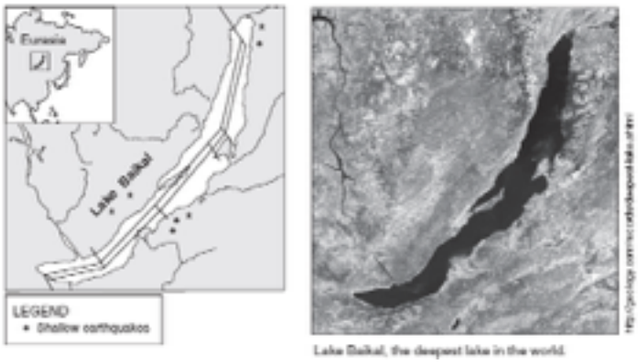
19. Consider the following descriptions of the movement of continental crust:

• Continents plow through the oceanic crust.
• Continents slide over the oceanic crust.

These statements are associated with which of the following?

A. mantle convection
B. seafloor spreading
C. Continental Drift Theory
D. Theory of Plate Tectonics

Use the following location map, plate boundary map and photograph to answer the next question.



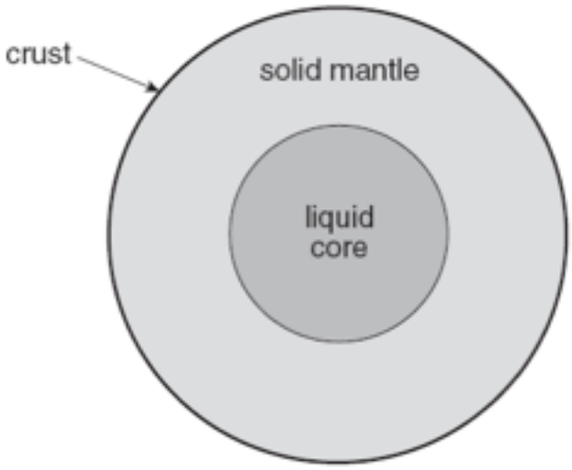
Lake Baikal, the deepest lake in the world.

20. What type of tectonic feature is responsible for the formation of Lake Baikal?
A. a trench B. a transform fault C. a diverging plate D. a converging plate

21. At which of the following locations is a spreading ridge most likely to occur?
A. an ocean-ocean divergent plate boundary
B. an ocean-ocean convergent plate boundary
C. a continent-continent transform plate boundary
D. a continent-continent convergent plate boundary

22. Which of the following statements correctly compares Earth's crust to the mantle?
A. It is thicker and denser than the mantle.
B. It is thinner and denser than the mantle.
C. It is thicker and less dense than the mantle.
D. It is thinner and less dense than the mantle.

Use the following illustration of the interior of a recently discovered planet to answer the next question.

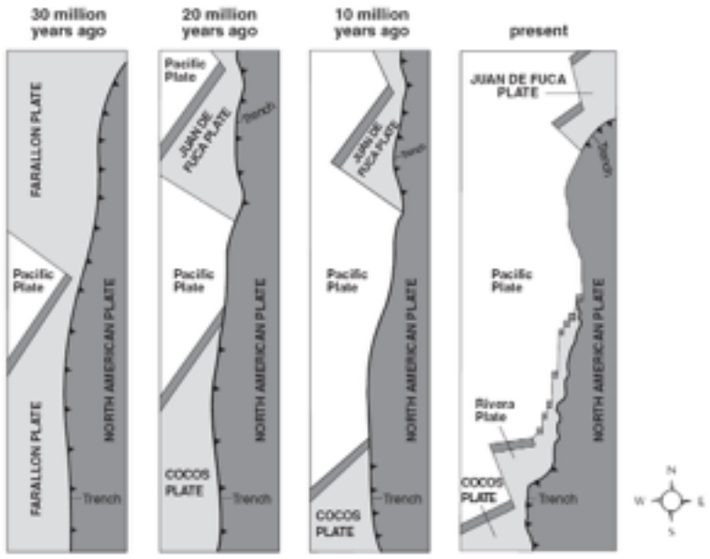


23. Which of the following seismic waves could be used to determine the depths of the solid mantle and liquid core of this planet?

I	surface waves
II	primary waves
III	secondary waves

A. II only B. I and II only C. I and III only D. II and III only

Use the following series of map diagrams for the Pacific Coast of North America to answer the next question.



24. Which of the following processes accounts for the absence of the Farallon Plate in the final diagram?

A. The Farallon Plate moved west along a transform fault.
B. The Farallon Plate collided with the Pacific Plate, forming a larger oceanic plate.
C. The Farallon Plate subducted beneath the Pacific Plate and parts of it were renamed.
D. The Farallon Plate subducted beneath the North American Plate and parts of it were renamed.

25. Alfred Wegener's Continental Drift Theory was based on which of the following?

I	fossil evidence
II	jigsaw puzzle fit of continents
III	matching up of mountain ranges
IV	magnetic reversals in the ocean crust

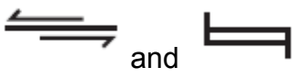
A. I and II only B. II and III only C. I, II and III only D. I, II, III and IV

Use the following map of South America to answer the next question.

26. What tectonic feature is found in the region from **P** to **Q**?
A. hot spot B. rift valley C. subduction zone D. transform fault zone

27. Which pair of symbols indicate the presence of a subduction zone?

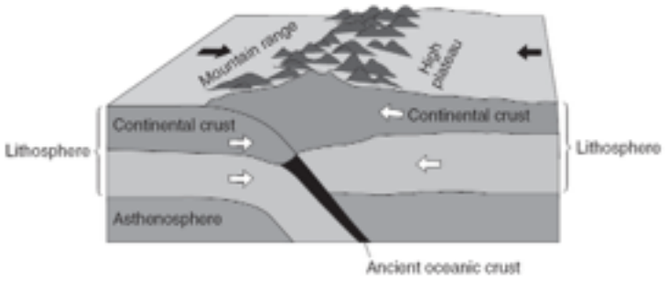
A.  and

B.  and

C.  and

D.  and

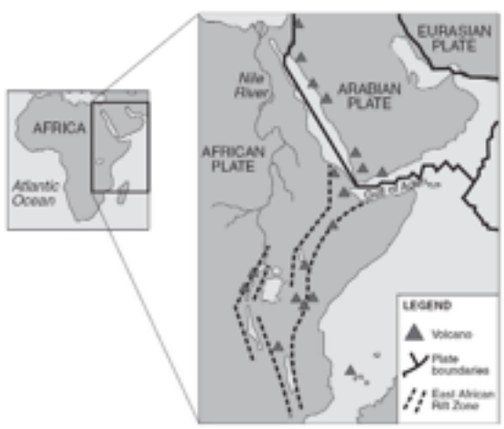
Use the following block diagram of a continental-continental convergent plate boundary to answer the next question.



28. Which of the following locations is most closely associated with the type of tectonic activity illustrated in the diagram?
A. Himalayas B. East Pacific Rise
C. Cascade volcanoes D. Yellowstone hot spot

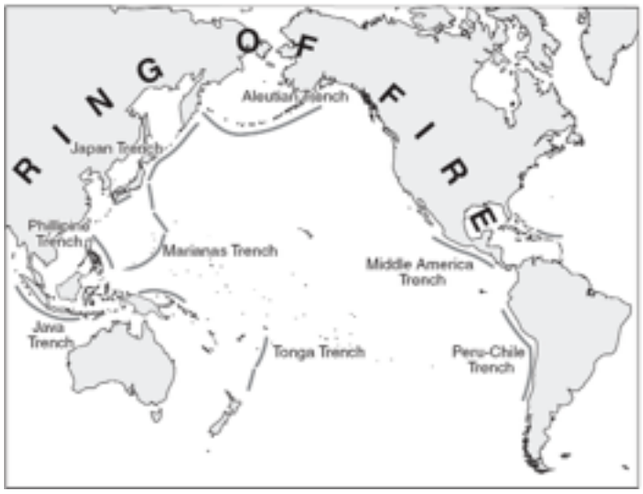
29. What will occur near the Gulf of Aden as the tectonic activity within the East African Rift Zone continues?

A. Sea water will flood the East African Rift Zone.
B. A subduction zone will form along the Gulf of Aden.
C. Volcanic activity in the East African Rift Zone will stop.
D. The Arabian Plate will move south along transform faults.



30. Which of the following processes forms the trenches which outline the Ring of Fire?

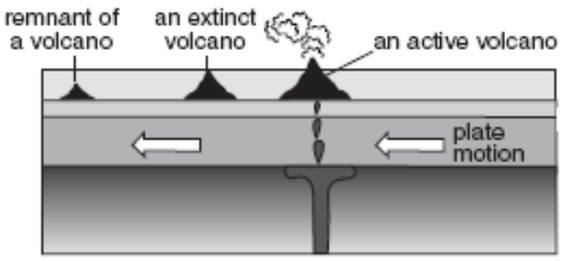
A. hot spot formation
B. divergence of oceanic crust
C. subduction of continental crust
D. subduction of an oceanic plate



31. Which of the following refers to the sinking of the crust into the mantle as a result of both ridge push and gravity?

A. Hotspot B. Slab Pull C. Magnetic Reverse D. Formation of a rift valley

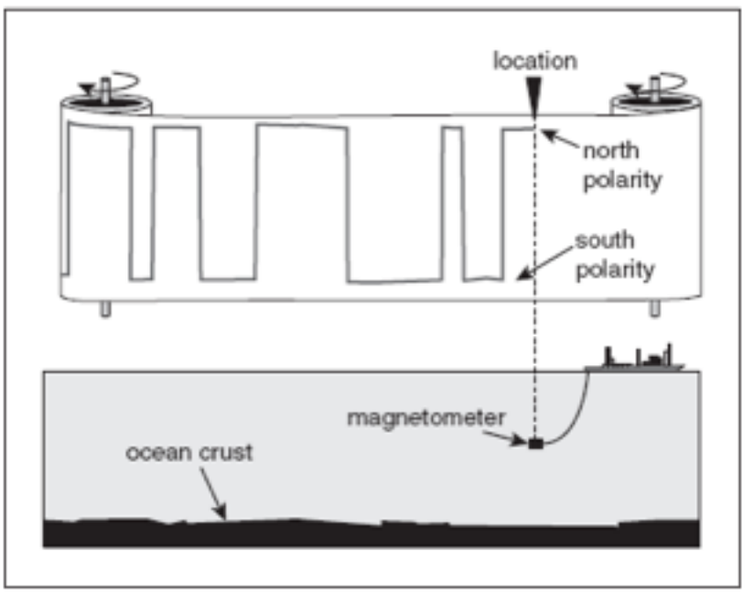
Use the following diagram to answer the next question.



32. What is responsible for the formation of these volcanoes?

A. A Hot spot B. A. Transform fault C. A spreading ridge D. A subducting plate

Use the following diagram of the collection of ocean crust magnetometer data to answer the next question.



33. Which of the following was explained by the pattern of alternating north and south polarities found on the ocean crust?

A. deep-sea trench B. seafloor spreading
C. volcanic island arc D. hot spot island chain

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1. C
2. D
3. C
4. A
5. C
6. B
7. B
8. C
9. D
10. B
11. A
12. A
13. C
14. C
15. B
16. A
17. D
18. C
19. C
20. C
21. A
22. D
23. D
24. D
25. C
26. C
27. D
28. C
29. A
30. D
31. B
32. A
33. B