

SCIENCE TEST

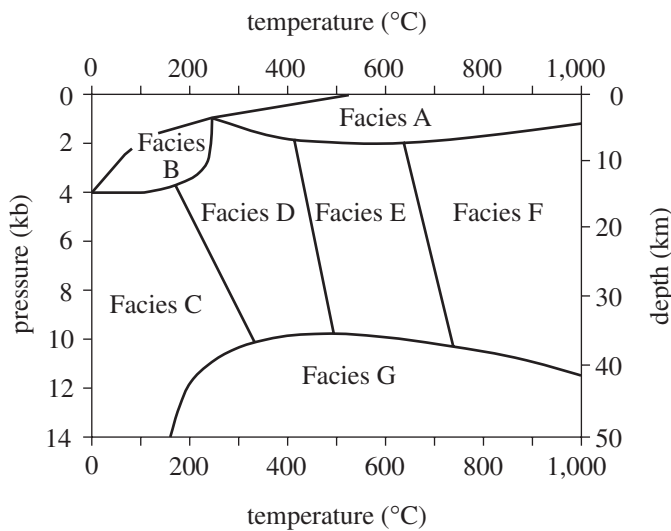
35 Minutes—40 Questions

DIRECTIONS: There are seven passages in this test. Each passage is followed by several questions. After reading a passage, choose the best answer to each question and fill in the corresponding oval on your answer document. You may refer to the passages as often as necessary.

You are NOT permitted to use a calculator on this test.

Passage I

Metamorphic rocks form when temperature and/or pressure cause changes in preexisting rock. Figure 1 shows the temperature and pressure conditions in which certain facies (categories of metamorphic rocks) are formed.



(Note: Boundaries are not actually sharp, distinct lines.)

Figure 1

Figure adapted from Sheldon Judson, Marvin Kauffman, and L. Don Leet, *Physical Geology*. ©1982 by Prentice-Hall, Inc.

A rock's *metamorphic grade* (a measure of the intensity of metamorphism) is classified on a scale of low (very similar to the original rock) to high (very different from the original rock). Table 1 lists the grades of Facies A–G from Figure 1. Figure 2 shows characteristic minerals that may be present in rocks of a given grade.

Table 1	
Facies	Metamorphic grade*
A	low
B	low
C	low to medium
D	low to medium
E	medium
F	medium to high
G	high

*Metamorphic grade is a measure of the intensity of metamorphism.

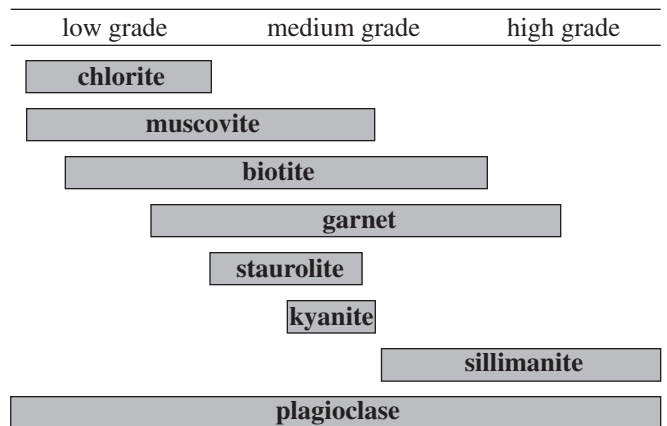


Figure 2

Figure 2 adapted from Frank Press and Raymond Siever, *Earth*. ©1986 by W. H. Freeman and Co.



1. According to Figure 2, which of the following minerals would most typically be found only in rocks of a medium grade?

- A. Muscovite
- B. Biotite
- C. Kyanite
- D. Plagioclase

2. According to Figure 1, a Facies G rock will most likely form under which of the following pressure and temperature conditions?

	<u>Pressure</u>	<u>Temperature</u>
F.	3 kb	800°C
G.	5 kb	400°C
H.	8 kb	1,000°C
J.	11 kb	600°C

3. Figure 1 indicates that as depth increases, pressure:

- A. decreases only.
- B. remains the same.
- C. increases only.
- D. increases, then decreases.

4. According to Figure 2, the presence of which of the following minerals in a metamorphic rock would be *least* helpful in determining that rock's grade?

- F. Chlorite
- G. Muscovite
- H. Staurolite
- J. Plagioclase

5. *Hornfels* is a metamorphic rock formed when *magma* (molten rock) heats sedimentary rocks on Earth's surface. According to Figure 1, hornfels is most likely a member of which of the following facies?

- A. Facies A
- B. Facies C
- C. Facies E
- D. Facies G