

The University of the State of New York

302D HIGH SCHOOL EXAMINATION

EARTH SCIENCE

Tuesday, January 27, 1948 — 1.15 to 4.15 p. m., only

Write at top of first page of answer paper (a) name of school where you have studied, (b) number of weeks and recitations a week in earth science. Give either the total number of laboratory periods in earth science and the length of such periods or the number of laboratory exercises performed. A paper lacking the statement of laboratory work will not be accepted at a standing of less than 75 credits.

The minimum time requirement is four or five recitations a week for a school year. An unprepared laboratory exercise of two periods counts in place of one recitation. At least 30 laboratory exercises are required.

Name of pupil.....Name of school.....

Answer all questions in part I and five questions from part II. Answers to the questions in part I should be written on the question paper as directed and handed in with the other answer paper. Answers should be numbered and lettered to correspond with the questions.

Part I

Answer all questions in part I.

Write on the line at the right of *each* statement the word or expression which, when inserted in the blank, will make the statement true. [15]

- 1 The tropopause separates the stratosphere from the 1.....
- 2 The flat base of a cumulus cloud indicates the level at which rising air reaches its 2.....
- 3 A wedge of cold air advancing into a region of warm air and lifting the warm air above it is a(an) ... front. 3.....
- 4 On March 21 the sun is below the horizon for about ... hours. 4.....
- 5 The radio broadcast of a basketball game heard in New York City at 8 p. m. would be heard in Denver, Colorado, at ... p. m. 5.....
- 6 Of the minerals always found in granite, the most resistant is 6.....
- 7 On a map, when the loop in a contour line crossing a river points north, the river is flowing 7.....
- 8 Seasonal winds that blow from land to sea in winter and in the opposite direction in summer are called 8.....
- 9 Tides of least range are called ... tides. 9.....
- 10 The most extreme weather changes take place along a(an) ... front. 10.....
- 11 When the sun is directly over the 15° N parallel, the twilight circle will extend ... degrees beyond the North Pole. 11.....
- 12 The name of a planet with a period of revolution less than 365 days is 12.....
- 13 Limestone deposits built up on the floor of a cavern are called 13.....
- 14 ... clouds are always composed of ice particles. 14.....
- 15 An intrusion of igneous rock between layers of sedimentary rock is called a(an) 15.....

EARTH SCIENCE — *continued*

Write on the line at the right of *each* statement the *number* preceding the word or expression that best completes the statement. [23]

- 16 If the moon rises one night at 6 p. m., it will rise the next night at about
 (1) 5:10 p. m. (2) 5:50 p. m. (3) 6:10 p. m. (4) 6:50 p. m. 16.....
- 17 The line along which a cold front has overtaken a warm front is called
 (1) a cold (2) an occluded (3) a stationary (4) a warm front. 17.....
- 18 On September 1 the sun's vertical rays are (1) at the tropic of Capricorn
 (2) at the equator (3) moving northward (4) moving southward 18.....
- 19 The terms *drift*, *alluvium*, *erratic*, *transported* all refer to features or processes
 related to (1) erosion (2) movements of the earth's crust (3) weathering
 (4) wind action 19.....
- 20 A degree of longitude is longest at the (1) Arctic circle (2) equator
 (3) prime meridian (4) tropic of Cancer 20.....
- 21 On October 21, February 21 and July 21, days and nights are of about equal
 length at the (1) Arctic circle (2) equator (3) tropic of Cancer (4) tropic
 of Capricorn 21.....
- 22 The strongest winds will usually be found where the number of miles between
 isobars is (1) 50 (2) 75 (3) 100 (4) 200 22.....
- 23 The greater part of the interior of the United States has a (1) continental
 (2) desert (3) Mediterranean (4) mountain type of climate. 23.....
- 24 Compared with a land area, a water area (1) heats faster and cools faster
 (2) heats faster and cools more slowly (3) heats more slowly and cools faster
 (4) heats more slowly and cools more slowly 24.....
- 25 The uplift of the land across which a stream is flowing might cause the formation
 of a (1) delta (2) meander (3) tributary (4) water gap 25.....
- 26 The velocity of a stream is determined by its (1) direction (2) gradient
 (3) length (4) source 26.....
- 27 Of the following, the rock that is porous and feels gritty is (1) basalt
 (2) sandstone (3) shale (4) slate 27.....
- 28 A weather element determined without the use of an instrument is (1) ceiling
 (2) humidity (3) visibility (4) wind velocity 28.....
- 29 The horse latitudes of the Northern Hemisphere are located (1) just north
 of the equator (2) at the Pole (3) north of the trade winds (4) at the
 Arctic circle 29.....
- 30 Glaciers are *not* responsible for (1) cirques (2) drumlins (3) potholes
 (4) sinkholes 30.....
- 31 Sandstone is composed chiefly of the mineral (1) calcite (2) hornblende
 (3) mica (4) quartz 31.....
- 32 Shale can usually be identified by (1) the acid test (2) its glassy texture
 (3) its rough "feel" (4) its odor of wet clay 32.....
- 33 An ore of aluminum is (1) bauxite (2) chalcopyrite (3) hematite
 (4) sphalerite 33.....
- 34 A low, formless, dark cloud that gives continuous rain or snow is
 (1) alto-cumulus (2) alto-stratus (3) cirro-cumulus (4) nimbo-stratus 34.....
- 35 Flood plains are composed of (1) alluvial (2) lacustrine (3) marine
 (4) residual soils. 35.....
- 36 The solar system consists of the sun, planets, satellites, planetoids and
 (1) comets with closed orbits (2) comets with open orbits (3) ring nebulae
 (4) spiral nebulae 36.....
- 37 The weather behind a cold front is usually (1) clear and colder (2) fair
 and warmer (3) foggy (4) warm and rainy 37.....
- 38 The peeling or shelling-off of the outer layers of rock is known as (1) cleavage
 (2) differential weathering (3) exfoliation (4) faulting 38.....

EARTH SCIENCE — *continued*

In *some* of the following statements the term in *italics* makes the statement incorrect. For each *incorrect* statement write on the line at the right the term that must be substituted for the italicized term to make the statement correct. For each *correct* statement write *true* on the line at the right. [12]

- 39 Both mesas and buttes are common in old *mountain* regions. 39.....
- 40 A gas-expanded, spongy volcanic rock is called *obsidian*. 40.....
- 41 The various minerals in a rock expand at *different* rate(s). 41.....
- 42 A regular shoreline is due to the *submergence* of the continental shelf. 42.....
- 43 When the cooling of molten magma takes place very *rapidly*, the mineral crystals are usually large. 43.....
- 44 When ground water loses some of the carbon dioxide carried in solution, it *deposits* limestone. 44.....
- 45 A great crack in a glacier is called a(an) *fault*. 45.....
- 46 Lakes are likely to become salty if the climate becomes *humid*. 46.....
- 47 A mineral that has a perfect cleavage in one direction is *mica*. 47.....
- 48 During the night the earth loses heat by the process of *convection*. 48.....
- 49 After a cold front passes, the pressure *rises*. 49.....
- 50 A ridge separating two river systems is called a *divide*. 50.....

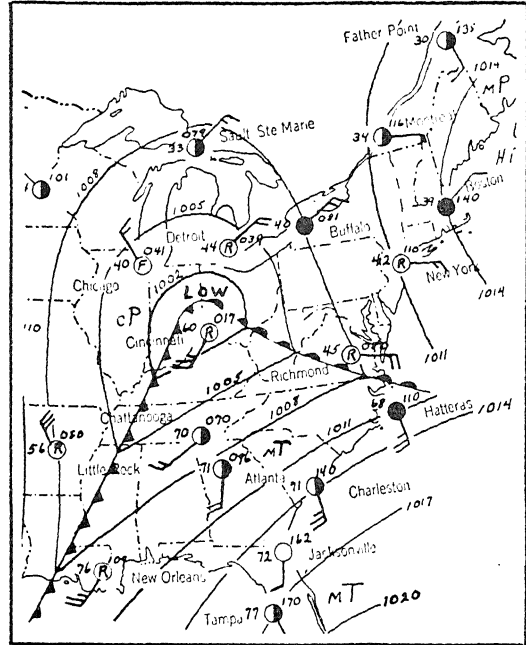
Part II

Answer five questions from part II.

- 1 a Explain what is meant by the water table. [2]
b Make a fully *labeled* diagram to show the relationship of the water table to temporary and permanent wells. [2]
c Make a fully *labeled* diagram showing all the conditions necessary for an artesian well. [4]
d Explain why artesian wells do not contain local ground water. [2]
- 2 The amount of water vapor in the atmosphere varies from a mere trace to about 5%.
a Distinguish between the processes of evaporation and condensation. [2]
b State *two* factors that increase the rate of evaporation. [2]
c Explain why ascending air currents may cause condensation. [2]
d Describe how the relative humidity of the air in your classroom may be determined. [4]
- 3 a Distinguish between solar and lunar eclipses by stating the conditions necessary for the occurrence of *each*. [2]
b By means of a *labeled* diagram, show the relative positions of the sun, earth and moon at the *four* principal phases of the moon. [4]
c Explain why there are great tidal ranges at times of solar and lunar eclipses. [2]
d Explain why we always see the same side of the moon. [2]
- 4 a Mature plateaus are often confused with mountains.
(1) How can you distinguish between a mature plateau and a mountain region? [2]
(2) Give an example of a mature plateau in eastern United States. [1]
b (1) Explain how domed mountains are formed. [2]
(2) Name a domed mountain in the United States. [1]
c (1) Explain how peneplanes are formed. [2]
(2) Give an example of a peneplane in eastern United States. [1]
d How was the Atlantic coastal plain formed? [1]

5 The accompanying portion of a weather map shows a large low-pressure area over eastern United States.

- a In what general direction will the low-pressure area move in the next 24 hours? [1]
- b Account for the rainfall at New York City. [2]
- c What change in temperature and in barometric pressure will occur at New York City in the next 24 hours? [2]
- d What change in wind direction will occur at New York City with the passage of the warm front? [1]
- e Name *two* air masses indicated on the map and locate the source region of each. [4]



6 Explain how each of *five* of the following are formed by some agent of weathering or erosion: (a) limestone caverns, (b) flood plains, (c) terminal moraines, (d) offshore bars, (e) talus, (f) residual soils. [10]

7 Explain each of *five* of the following: [10]

- a Sedimentary rocks in contact with an igneous intrusion become metamorphosed.
- b The leeward side of a mountain has less rainfall than the windward side.
- c It may be January 20 in Japan when it is January 19 in California.
- d Places north of the Arctic circle have 24 hours of daylight on June 21.
- e The heat equator shifts farther north of the geographic equator than it does south of it.
- f The temperature of the lower air is higher than that of the upper air.

8 a What contour interval is used on this map? [1]

b Which of the two hills, A or B, shown on the map, is the higher? How much higher? [2]

c In what direction does the tributary stream flow? [1]

d How is steepness of slope indicated on a contour map? Make an X on this map where the slope is steepest. [2]

e What is the distance along the Red River from the mouth to point C? [2]

f Shade the area on the map that would be under water if the sea level were to rise 40 feet. [2]

