

The University of the State of New York

294TH HIGH SCHOOL EXAMINATION

EARTH SCIENCE

Tuesday, June 19, 1945 — 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 ninth-year science, (c) 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 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. Whenever questions in part II so direct, answers to these questions are to be written on the question 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. [22]

- 1 A coastal plain forms when the ... is uplifted. 1.....
2 Rainy climate is characteristic of coastal regions located on the ... side of mountains. 2.....
3 The chemical element that constitutes nearly 50% of the earth's crust is .... 3.....
4 The Greenland icecap is an example of a (an) ... glacier. 4.....
5 An artesian well exists only when a (an) ... occurs between two impervious rock layers. 5.....
6 Sinkholes are common in Florida because the underlying rock is .... 6.....
7 The free end of a barrier beach is called a (an) .... 7.....
8 The international date line corresponds generally with the ... meridian. 8.....
9 When a rising current of air expands and cools, its capacity to hold water vapor .... 9.....
10 A river that meanders may shorten its course by producing a (an) .... 10.....
11 The continuous black lines drawn on weather maps to show the position of "lows" and "highs" are called .... 11.....
12 The many boulders scattered over New England indicate that the area was once covered by a (an) .... 12.....
13 At 12 o'clock noon, the chronometer of a plane reads 3 p. m. The longitude of the plane is .... 13.....
14 An instrument that measures relative humidity is the .... 14.....
15 An isotherm is a line drawn through places that have the same .... 15.....

EARTH SCIENCE—continued

- 16 A total eclipse of the sun may occur only at the ... moon phase. 16.....
- 17 If the earth's axis were inclined more than  $23\frac{1}{2}$  degrees, the winters in New York State would be .... 17.....
- 18 Rock fragments that accumulate at the base of steep slopes are called .... 18.....
- 19 When the northeast trades cross the equator, they change their direction and blow from the .... 19.....
- 20 The moon appears to rise and set because of the ... of the earth. 20.....
- 21 The contour interval on a map is 20 feet; eight contour lines are shown, including the line at the base of a hill and the one at the summit. The summit of the hill is ... feet above its base. 21.....
- 22 An atmospheric pressure of 1013 millibars may be recorded on some weather maps as a pressure of ... inches. 22.....

Write on the line at the right of *each* statement the *number* preceding the word or expression that best completes the statement. [16]

- 23 Active volcanoes are frequently found in (1)young mountains (2)old mountains (3)mature mountains (4)dissected plateaus 23.....
- 24 Earthquake vibrations recorded by seismographs indicate that the earth's interior is (1)gaseous (2)molten (3)plastic (4)rigid 24.....
- 25 All places on the earth have 12 hours of daylight on (1)March 21 (2)June 21 (3)August 21 (4)December 21 25.....
- 26 A characteristic weather condition along a rapidly moving cold front is (1)clear skies (2)cumulus-type clouds (3)fog (4)stratus-type clouds 26.....
- 27 Most earthquakes occur in regions of (1)extinct volcanoes (2)faults (3)glaciation (4)rapid erosion 27.....
- 28 The drowned mouth (estuary) of the Thames River is the result of (1)erosion (2)floods (3)rising of the coast (4)sinking of the coast 28.....
- 29 A star differs from a planet in that a star (1)revolves around the sun (2)has a fixed orbit (3)is self-luminous (4)shines by reflected light 29.....
- 30 The boundary of relatively cold air advancing into an area of warmer air is called a (an) (1)cold (2)occluded (3)stationary (4)warm front. 30.....
- 31 The process by which the sun gives off energy is called (1)conduction (2)convection (3)insolation (4)radiation 31.....
- 32 A thick fog is most likely to occur when the (1)air is turbulent (2)temperature is rising (3)wind velocity is high (4)wind velocity is low 32.....
- 33 A mineral that can be scratched by the fingernail is (1)feldspar (2)mica (3)hornblende (4)quartz 33.....
- 34 Residual soils are formed by (1)gravity (2)shore currents (3)wind (4)weathering 34.....
- 35 A river may form an alluvial fan when (1)an obstruction is present (2)its valley widens (3)it enters a quiet body of water (4)the slope of its bed decreases 35.....
- 36 Rocks that are changed by heat and pressure are classified as (1)igneous (2)metamorphic (3)sedimentary (4)unconsolidated 36.....
- 37 Horizontal rock layers occur frequently in (1)domed mountains (2)folded mountains (3)penepplanes (4)plateaus 37.....
- 38 The mineral feldspar (1)can be scratched by mica (2)fractures like quartz (3)has right-angle cleavage (4)shows double refraction 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 The star *Sirius* is located almost directly over the North Pole. 39.....
- 40 Anticlines and synclines are characteristic of *folded* mountains. 40.....
- 41 The greatest ocean depths have been recorded in the *Indian* Ocean. 41.....
- 42 Heat is distributed through the lower air principally by *conduction*. 42.....
- 43 *Sandstone* may be metamorphosed into slate. 43.....
- 44 The brown stain in some rocks is due to the chemical union of oxygen with the *iron* of the rocks. 44.....
- 45 Daily rains occur in the *trade wind* belt. 45.....
- 46 The heat equator is a line drawn through places that have the *same* temperature. 46.....
- 47 The air currents at the center of a hurricane move vertically *downward*. 47.....
- 48 The *ceiling* at an airport is determined by the height of the low clouds. 48.....
- 49 The fraction  $1/62,500$  that appears on many contour maps indicates that 1 inch on the map corresponds to an actual distance of 1 *foot*. 49.....
- 50 Contour lines that occur at equal distances from one another indicate a slope that is *uniform*. 50.....

**Part II**

**Answer five questions from part II.**

- 1 *a* Make a labeled diagram that represents the relative positions of the earth, the sun and the moon at the time of the new moon phase. [2]  
*b* Explain why the highest tides occur at the new moon phase. [2]  
*c* Make a labeled diagram that represents the occurrence of a total and of a partial eclipse of the moon. [4]  
*d* Explain the cause of the phases of the moon. [2]
- 2 *a* Distinguish between weathering and erosion and name an agent of each. [4]  
*b* Describe and illustrate chemical weathering. [2]  
*c* Describe and illustrate mechanical weathering. [2]  
*d* State *two* reasons why weathering does not take place everywhere at the same rate. [2]
- 3 In its upper course the Mississippi is a *young* river; in its middle course it is *mature*; in its lower portion it is *old*.  
*a* In what part of its course does the Mississippi begin to meander? Explain or illustrate by a labeled diagram how a river forms a meander. [3]  
*b* In what part of the course are waterfalls found? Explain or illustrate by a labeled diagram how waterfalls are formed. [3]  
*c* In what part of the course has the Mississippi formed a broad flood plain? Explain how flood plains are formed. [3]  
*d* Why was a delta formed at the mouth of the Mississippi? [1]

EARTH SCIENCE — *concluded*

4 The diagram represents a cyclonic area (low) that is becoming occluded (closed in).

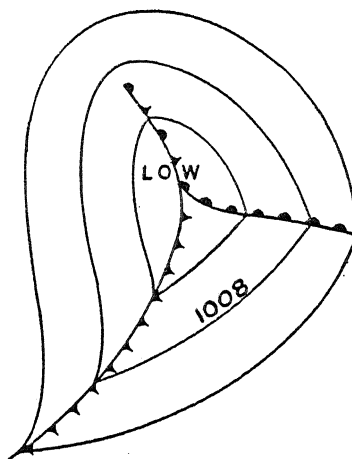
a Label on the diagram the *three* fronts. [3]

b With arrows indicate the general wind circulation within this low pressure area. [2]

c Indicate the correct pressure on *each* isobar. [2]

d How does pressure change after the passage of a cold front? [1]

e Why do clouds and precipitation occur along or near fronts? [2]



5 Explain *each* of the following: [10]

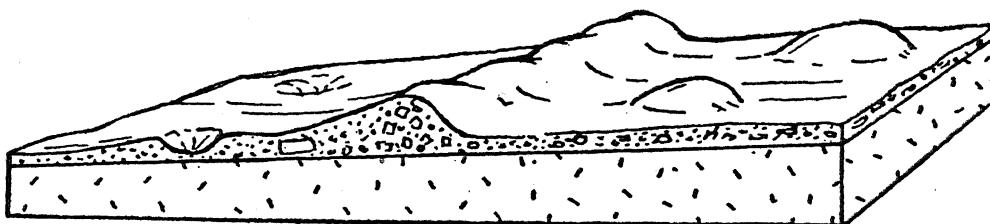
a The sun's vertical rays never strike the earth farther north than the Tropic of Cancer.

b Islands have a smaller seasonal change in temperature than do continents.

c Stars move at great speeds, yet their positions in constellations seem to remain unchanged.

d There is a difference of one hour in time for every 15 degrees of longitude.

e Many deserts are located in the trade wind belt.



6 a Label on the diagram the following features: drumlin, ground moraine, outwash plain, kettle, terminal moraine. [5]

b Draw an arrow that shows the direction in which the glacier moved over the region. [1]

c Describe the formation of *two* of the features listed in a. [4]

7 The amount of radiant energy (insolation) received from the sun varies.

a Explain why the vertical rays of the sun have a greater heating effect than the slanting rays. [2]

b Explain how the condition of the atmosphere affects the amount of heat energy a place receives. [2]

c How does the unequal heating of the earth's atmosphere cause winds? [1]

d Make a fully labeled diagram that represents the planetary wind and calm belts of the Northern Hemisphere. [5]

8 a Mention *two* types of volcanoes and describe the appearance of their cones. [4]

b Name an active volcano of *each* type mentioned, and state in which volcanic belt each is located. [4]

c Dikes and sills indicate former volcanism. Explain how *each* feature was formed. [2]