The University of the State of New York

288TH HIGH SCHOOL EXAMINATION

EARTH SCIENCE

Tuesday, June 15, 1943 — 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, four questions from part II and one question from part III. 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 or in part III 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 *number* preceding the term that best completes the statement. [15]

1 The coarse-grained igneous rock that always contains quartz and feldspar is (1) granite (2) pumice (3) obsidian (4) basalt 1.....

2 The sun's vertical rays strike the earth's surface farthest south on (1) June 21 (2) September 23 (3) December 21 (4) March 21 2.....

3 Sun spots show that the (1) earth rotates on its axis (2) sun rotates on its axis (3) earth revolves about the sun (4) sun is moving through space 3.....

4 An intrusion of igneous rock that cuts across sedimentary layers is called a (1) dike (2) sill (3) laccolith (4) boss 4.....

5 The thin feathery clouds that fly at high levels above the earth's surface are known as (1) stratus (2) altocumulus (3) cirrus (4) cumulus 5.....

6 The chief mineral found in limestone and marble is (1) quartz (2) mica (3) calcite (4) feldspar 6.....

7 The weather instrument that gives a continuous record of atmospheric pressure is the (1) barograph (2) mercurial barometer (3) thermograph (4) anemometer 7.....

8 When the moon casts its umbra on a portion of the earth's surface, the eclipse there is (1) total solar (2) total lunar (3) partial solar (4) partial lunar 8.....

9 The air mass that brings hot and humid weather to the southern and eastern parts of the United States during the summer is the (1) Continental Polar (2) Maritime Tropical (3) Maritime Polar (4) Superior 9.....

10 The (1) Arctic circle (2) equator (3) 45th parallel (4) Tropic of Cancer is a great circle. 10.....

11 Most earthquakes occur in regions of (1) extensive glaciation (2) bad lands (3) young mountains (4) maturely dissected plateaus 11.....

12 On June 21 at the Arctic circle there will be (1) 0 (2) 12 (3) 18 (4) 24 hours of daylight. 12.....

13 Weather Bureau maps show atmospheric pressures in (1) inches (2) millimeters (3) millibars (4) pounds per square inch 13.....

14 The fact that sea caves are sometimes found a considerable distance inland is evidence that the shore line has (1) emerged (2) submerged (3) been modified by the growth of corals (4) been altered by the action of ground water 14.....

15 Rising currents of air are (1) warmed by expansion (2) warmed by compression (3) cooled by expansion (4) cooled by compression 15.....

Write on the line at the right of *each* statement the term which, when inserted in the blank, will make the statement true. [20]

16 Ground water that contains dissolved ... is an effective erosion agent in limestone areas. 16.....

17 The name of a light spongy volcanic rock is .... 17.....

18 Elevations that separate adjacent river basins are called .... 18.....

19 The scalar fraction 1/62,500 found on many contour maps means that one inch on the map represents a distance of approximately .... 19.....

20 Breaks in bedrock along which displacements occur are called .... 20.....

21 As the result of strains set up by the uneven rate of movement of glaciers, ... develop in the ice. 21.....

22 The portion of the atmosphere characterized by decreasing temperatures as altitude increases is known as the .... 22.....

23 The energy absorbed by land during the day is lost at night by .... 23.....

24 A river that cuts sideward rather than downward is in the ... stage of its erosion cycle. 24.....

25 The belt of high-pressure calms located about 30° north of the equator is the .... 25.....

26 The earth is nearest the sun in our ... season. 26.....

27 At noon on shipboard, a chronometer reads 4 p. m. Greenwich time. The longitude of the ship is .... 27.....

28 The extremely cold Russian winters are typical of the ... type of climate. 28.....

29 The winds that blow equatorward from the horse latitudes are the ... 29.....

30 Compressed layers of ... become shale. 30.....

31 Rock fragments that accumulate at the foot of cliffs because of the action of gravity are known as .... 31.....

32 No place has a longitude of more than ... degrees. 32.....

33 Land masses heat more ... than do water masses exposed to the same amount of insolation. 33.....

34 The coral rings that inclose lagoons in the South Pacific are called .... 34.....

35 The light reflected from the dark portion of the moon at its new crescent phase is called .... 35.....

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 the word *true* on the line at the right. [15]

36 Isobars that are far apart indicate *low* wind velocities. 36.....

37 Rounded pebbles are produced by *glacial* action. 37.....

38 A river usually carries the largest portion of its rock load in *solution*. 38.....

39 *Igneous* rock is formed when sedimentary rock is altered by heat and pressure. 39.....

40 The galaxy of stars in which our sun is located is *Andromeda.* 40.....

41 Winds are deflected to the right of the pressure gradient in the Northern Hemisphere as a result of the earth's *revolution.* 41.....

42 The irregular coast line of Maine is an example of a shore line of *submergence.* 42.....

43 *Transported* mantle rock resembles the bedrock beneath it. 43.....

44 The lunar eclipse that was visible in New York State last February occurred during the *full* moon phase. 44.....

45 When it is noon, Wednesday, on Guadalcanal, (approximately 160° E. longitude) it is *Tuesday* in the United States. 45.....

46 Igneous rocks that have formed by the *slow* cooling of magma have small crystals. 46.....

47 The seasonal winds that bring heavy rainfall to India blow from the *northeast.* 47.....

48 If the earth's axis were inclined more than 23½°, the winters in the Northern Hemisphere would be *warmer.* 48.....

49 The percentage of oxygen in the earth's crust *is greater than* that in the earth's atmosphere. 49.....

50 If an anticyclone is directly north of a place, the winds at that place will blow from a *westerly* direction. 50.....

Part II

Answer four questions from part II.

1 Weathering agents cause surface rocks to disintegrate.

a Distinguish between mechanical and chemical weathering and give an example of *each* type. [4]

b How does weathering assist erosion? [2]

c Name *two* factors that control the rate at which weathering occurs. [2]

d Explain why granite weathers more rapidly than marble in arid (dry) regions. [2]

2 A knowledge of the positions of stars and the movements of other heavenly bodies is important to navigators.

a Name a star used by the navigator to determine latitude in the Northern Hemisphere and describe the observation that he makes. [2]

b Planets may be mistaken for stars. State *two* ways by which planets can be distinguished from stars. [2]

c At times, the heavenly bodies can not be seen and radio equipment can not be used. Describe briefly a method that a navigator can use to determine his position. [2]

d Explain why navigational stars appear to change their positions during the night. [2]

e The stars Antares, Arcturus, Betelgeuze, Sirius and Vega are used by navigators. Name the constellation in which each of *two* of these stars is located. [2]

3 Write physiographic explanations of *five* of the following: [10]

a Airplane pilots try to avoid flying through cumulonimbus clouds (thunderheads).

b Rain occurs almost every day on the Solomon Islands.

c The weather in the stratosphere is safer for flying than is that of lower altitudes.

d The falls at Niagara have retreated several miles from their former position.

e Volcanos frequently occur along fairly straight lines.

f Dry weather occurs during June along the north coast of Africa.

4 Wells supply some 70% of the drinking water used in the United States.
a Distinguish between the wet-weather and the dry-weather water tables. [2]
b Make a fully labeled diagram that shows the conditions necessary for the formation of an artesian well. [4]
c Explain why the water in artesian wells is free from local contamination. [2]
d Explain why the water from flowing artesian wells comes out under its own pressure. [2]

5 *a* Explain fully how to determine the relative humidity of the air. [4]
b What effect does relative humidity have on the rate of evaporation of water? [2]
c State *two* factors that cause condensation of water vapor from the air. [2]
d Fogs occur frequently in the Aleutian Islands. Explain how fogs are formed. [2]

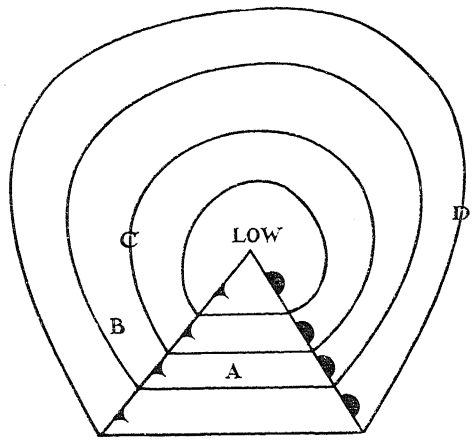
6 Mountains are formed by folding, faulting or doming of the earth's crust or by combinations (complex mountains) of these processes.
a Name and identify mountain ranges formed by each of *three* of the above processes. [3]
b Make labeled diagrams that show the *structure* of *two* types of mountains. [2]
c Explain why mesas and buttes are characteristic features of old plateaus. [2]
d Name a region that is a peneplane, and describe the formation of peneplanes. [3]

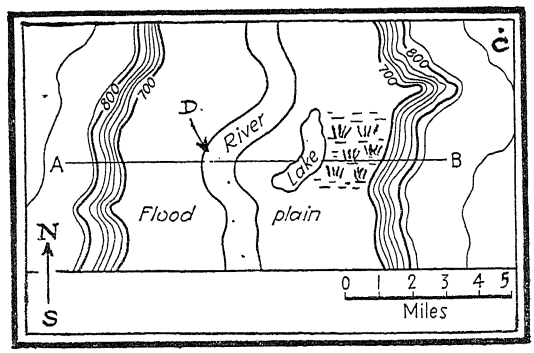
Part III

Answer one question from part III.

7 The diagram represents a well-developed cyclonic area (low) moving from west to east across the United States.

a Label, on the diagram, the warm and the cold fronts. [2]
b Draw arrows on the diagram that represent the circulation of winds within this area. [2]
c Explain why the atmospheric pressure is lower at *C* than at *D*. [1]
d Explain why the air temperature is lower at *B* than at *A*. [2]
e Where, in the cyclonic area, does the greatest wind shift occur? [1]
f Explain why precipitation usually occurs along the fronts. [2]



8 The diagram shows a section of a large river and its flood plain.

a State the contour interval used. [1]
b What is the elevation of the flood plain? [1]
c State the elevation of the bluffs above the flood plain. [1]
d What is the width of the flood plain along the line *A-B*? [1]
e What is the *greatest possible* elevation above sea level of point *C*? [1]
f Explain how the lake on the flood plain was formed. [2]
g Place an *X* on the diagram to show the location of a tributary valley to the east of the river. [1]
h State what occurs at point *D* and explain why it occurs. [2]