The University of the State of New York

286TH HIGH SCHOOL EXAMINATION

# EARTH SCIENCE

Tuesday, January 19, 1943 — 1.15 to 4.15 p. m., only

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**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. [16]

1 Air masses that move from Canada toward the United States are usually (1) cool and dry (2) cool and moist (3) warm and dry (4) warm and moist 1.....

2 The chief work of a river in old age is (1) deposition of sediment (2) downward erosion (3) headward erosion (4) sideward erosion 2.....

3 The length of a lunar month is (1) 15 (2) 24 (3) $27\frac{1}{3}$ (4) $29\frac{1}{2}$ days. 3.....

4 A shore line of submergence is characterized by (1) many lagoons (2) poor harbors (3) promontories (4) shallow water 4.....

5 A mountain region in youth is characterized by (1) mesas (2) monadnocks (3) rounded peaks (4) sharp peaks 5.....

6 Pacific War Time corresponds to the standard time at the (1) 75th (2) 90th (3) 105th (4) 120th meridian west longitude. 6.....

7 The shortest route between the United States and Russia is (1) across the Atlantic Ocean (2) a great circle route (3) along a meridian (4) along a parallel of latitude 7.....

8 A rock that is weathered rapidly by frost action is (1) impervious (2) pervious (3) soft (4) soluble 8.....

9 Sedimentary bedrock in contact with (1) clay (2) fossils (3) magma (4) peat is metamorphosed. 9.....

10 Rain is brought to the interior of continents by (1) passing anticyclones (2) migration of the Horse Latitudes (3) descending air (4) passing cyclones 10.....

11 The striae in the northeastern states are traces of glacial movement from a center in (1) Greenland (2) Labrador (3) the Arctic (4) the Great Lakes 11.....

12 The course of a river with a flood plain is (1) meandering (2) steep (3) straight (4) ungraded 12.....

13 Plateaus usually have (1) anticlines (2) flat-topped divides (3) low relief (4) many swamps 13.....

14 A boulder rolled around on a stream bed will aid in forming a (1) cavern (2) kettle hole (3) pothole (4) sinkhole 14.....

15 We see one half of the lighted portion of the moon at the (1) first quarter (2) new crescent (3) new gibbous (4) new moon phase. 15.....

16 The most extensive plains region of the world is located in (1) central India (2) Australia (3) northern Siberia (4) the Amazon basin 16.....

Write on the line at the right of *each* statement the term which, when inserted in the blank, will make the statement true. [19]

17 A planet that resembles the Earth in its rotation period is .... 17.....

18 The retreat of a waterfall indicates that the process of ... is occurring. 18.....

19 Frost forms when the ... is below 32° F. 19.....

20 A deposit called a ... is built where a swift stream flows into a lake. 20.....

21 The earth rotates eastward 30° in ... hours. 21.....

22–23 In the northern hemisphere, winds in a "high" tend to be deflected to the ... of the pressure gradient. This deflection is caused by the earth's .... 22..... 23.....

24 The crumbling of a rock due to temperature changes is called ... weathering. 24.....

25 All parts of the earth have 12 hours of daylight on .... 25.....

26 The zero contour line on a map represents .... 26.....

27 The last part of a volcano to be removed by erosion is the .... 27.....

28 An example of a plateau formed by fissure lava flows is the .... 28.....

29 The roof of a limestone cave may collapse and leave a .... 29.....

30 Ground water that contains ... dissolves limestone. 30.....

31 Islands in the South Pacific have a (an) ... type of climate. 31.....

32 A planet that goes through phases similar to our moon is .... 32.....

33 The leeward sides of high mountain ranges have a ... rainfall. 33.....

34 Earthquakes occur when rocks slip along a .... 34.....

35 A meandering stream deposits sediment on the ... of the curve. 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 The monsoons that blow over southeastern Asia during January are the *northeast* monsoons. 36.....

37 Ground fog (radiation fog) occurs chiefly during the *day*. 37.....

38 Our moon belongs to the class of bodies known as *planetoids*. 38.....

39 The length of the *rotation* period of the earth determines the length of its year. 39.....

40 Low relative humidity *increases* the rate of evaporation of water. 40.....

41 If the center of a cyclone is directly south of a place, the winds at that place will be from the *south*. 41.....

42 The density of the air *decreases* as the altitude increases. 42.....

43 Winds become hooked trades when they cross the *Tropic of Cancer*. 43.....

44 Airplanes that fly *north* of the center of a "low" from San Francisco to Hawaii are aided by the air movement around the "low." 44.....

45 Winters in mid-continent are *less severe* than on the coast. 45.....

46 When it is noon, Tuesday, in Los Angeles, it is *Tuesday* in Australia. 46.....

47 When a wet-bulb and a dry-bulb thermometer are exposed to air completely saturated with water vapor, they indicate the *same* temperature. 47.....

48 Drowned valleys are formed when sea level *drops*. 48.....

49 When numerous lakes exist in the upper course of a river, they tend to *increase* flood conditions near the river mouth. 49.....

50 A good absorber of insolation is also a good *reflector* of insolation. 50.....

## Part II

**Answer four questions from part II.**

1 Each of the following items is the result of constructive or destructive action by an agent of erosion or by weathering: (1) alluvial fans, (2) canyons, (3) cirques, (4) drumlins, (5) dunes, (6) flood plains, (7) hanging valleys, (8) moraines, (9) residual soils, (10) sandblasted rocks. Place the *number* of *each* item in its proper position in the table. [10]

| | *Wind* | *Rivers* | *Glaciers* | *Weathering* |
|---|---|---|---|---|
| Constructive action | | | | |
| Destructive action | | | | |

2 *a* State the altitude at point *M*. [1]

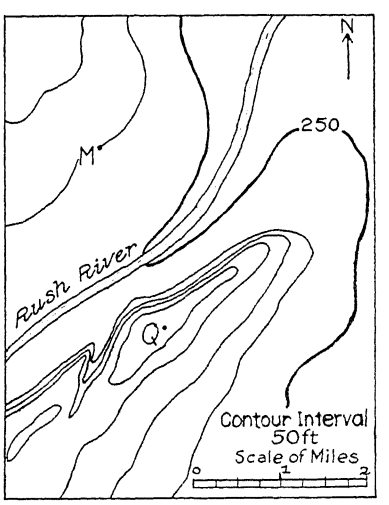
*b* State the direction of flow of the Rush River and explain how the direction of flow of a river may be determined from a contour map. [2]

*c* What is the greatest altitude at point *Q*? [1]

*d* What is the distance from *M* to *Q*, to the *nearest quarter of a mile*? [1]

*e* Label, on the diagram, a steep slope and a gentle slope. [2]

*f* Label a tributary valley west of point *Q*. Draw the stream that flows through this valley. In what stage of the erosion cycle is this valley? [3]




3 *a* Explain the heating of the earth's atmosphere. [2]

*b* Why does the warmest part of the day usually occur three hours after noon? [2]

*c* Name *two* factors of the atmosphere that affect the amount of solar energy reaching the earth's surface and state the effect of each factor named. [2]

*d* The polar regions receive insolation continuously during six months. Why are these regions not the warmest places on the earth? [2]

*e* Compare and explain the rate of warming of land and water areas at the same latitude. [2]

4 Weather observations are made every four hours at hundreds of meteorological stations in the United States.

*a* Name *four* weather elements shown on weather maps and mention the instrument used to measure each weather element named. [4]

*b* Lightning is not especially harmful to aircraft. Explain why thunderstorms are serious hazzards to aircraft. [2]

*c* Name a type of cloud that indicates (1) rising air, (2) air in horizontal motion. [2]

*d* Why do airplane pilots need to know the dew point of the air along their flight path? [2]

5 Minerals are increasingly important to the war effort.

*a* Name *two* of the common chemical elements that form minerals. [2]

*b* Name *four* common rock-forming minerals. [4]

*c* Name a rock in which each of *two* of the minerals named is usually found. [2]

*d* State an economic use for each of *two* of the minerals named. [2]

6 *a* Why do star groups appear to swing in a circle during the night? [2]

*b* What star is at the approximate center of the circle? How is this star used to determine the latitude of a ship? If the ship is at 50° north latitude, how far above the horizon will this star be? [3]

*c* What is the longitude of a ship when the ship's time is two hours earlier than Greenwich time? [1]

*d* Why do we see different groups of stars in the summer and in the winter sky? [2]

*e* Name *two* heavenly bodies that are not stars but that, like stars, may appear in constellations. [2]

## Part III

**Answer one question from part III.**

7 The anthracite fields of Pennsylvania lie in a folded mountain region, whereas the bituminous fields are in a plateau area.

*a* The coal is found in synclines. Draw a labeled diagram that illustrates coal in a syncline. [2]

*b* Geologists think that the coal deposits were once more extensive than they now are. Draw dotted lines on the diagram to show where the coal once was. What became of the missing coal? [2]

*c* Explain how mountain folds are formed. [2]

*d* The bituminous coal in the plateau and the anthracite in the mountains started to form during the same geologic period. Explain the process by which bituminous coal was changed to anthracite. [2]

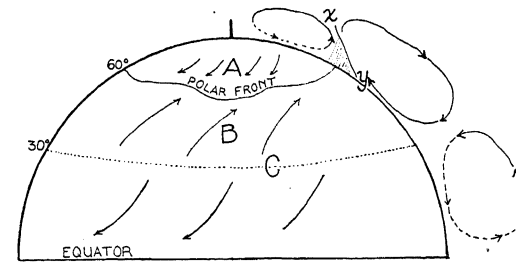
*e* The coal came from plant tissue. Why do we find layers of bituminous coal several hundred feet below the earth's surface? [2]

8 *a* Name the wind belt at *A* and at *B*. [2]

*b* Name the belt at *C* and tell whether this region is characterized by high or by low air pressure. [2]

*c* In what region, shown on the diagram, do cyclones develop, and what is their general direction of movement? [2]

*d* A vertical section of air is shown at the right of the diagram. Is the cooler air mass above or below the boundary $x$ — $y$? Is the more moist air mass above or below the boundary? [2]




*e* Explain why rainfall occurs, as shown, below the boundary $x$ — $y$. [2]