

The University of the State of New York

299TH HIGH SCHOOL EXAMINATION

EARTH SCIENCE

Tuesday, January 28, 1947 — 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. 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 term which, when inserted in the blank, will make the statement true. [20]

- 1 The layer of the atmosphere in which daily changes of weather take place is the .... 1.....
- 2 The hardness of a mineral can be determined by the ... test. 2.....
- 3 A mountain region that has been worn down to almost base level by agents of erosion is called a (an) .... 3.....
- 4 A crack in the earth's crust along which a movement of rock layers occurs is called a (an) .... 4.....
- 5 Masses of rock and metal that enter the earth's atmosphere from outer space are called .... 5.....
- 6 The moon belongs to a class of solar-system bodies called .... 6.....
- 7 Circular star trails are evidence that the earth .... 7.....
- 8 The ratio of the absolute humidity of a mass of air to its capacity is called .... 8.....
- 9 The wind belt in which most of Europe is located is the .... 9.....
- 10 The process by which the sun's energy travels to the earth is called .... 10.....
- 11 Heat is distributed throughout the lower layers of the atmosphere principally by .... 11.....
- 12 The high tides that occur at the new moon phase are called .... 12.....
- 13 Most of the large deserts of the earth lie in the ... wind belts. 13.....
- 14 A wind that blows from sea to land during the day is called a (an) ... breeze. 14.....
- 15 The date on which the sun's vertical rays strike the earth's surface farthest south is .... 15.....
- 16 The high, thin, feathery clouds that indicate the approach of a warm front are called .... 16.....

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- 17 An instrument that automatically makes a continuous record of temperature is called a (an) .... 17.....
- 18 Lines that indicate equal atmospheric pressures on weather maps are called .... 18.....
- 19 Contour lines that are close together on a topographic map indicate that the slope is .... 19.....
- 20 The unit that is used in measuring the distance from the earth to various stars is a (an) .... 20.....

Write on the line at the right of *each* statement the *number* preceding the term that best completes the statement. [19]

- 21 The earth's atmosphere is (1)largely oxygen (2)a mixture of gases (3)a chemical compound (4)a single gas 21.....
- 22 Salt lakes are caused by (1)evaporation (2)heavy rainfall (3)hot springs (4)lowered outlets 22.....
- 23 The agent of erosion that forms talus deposits is (1)gravity (2)running water (3)wave action (4>wind 23.....
- 24 The greatest difference in the length of day and of night occurs at the (1)Arctic Circle (2)equator (3)tropic of Cancer (4)40th parallel 24.....
- 25 Young rivers (1)deepen their valleys (2)form meanders (3)build flood plains (4)overflow their banks 25.....
- 26 Rivers form deltas when they (1)overflow their banks (2)increase their velocity (3)meet an obstruction (4)flow into a large body of water 26.....
- 27 Much of the heat gained by the earth during the day is lost at night by (1)conduction (2)convection (3)radiation (4)reflection 27.....
- 28 The rays that result in the greatest amount of insolation are those that strike the earth's surface at an angle of (1)45° (2)90° (3)135° (4)180° 28.....
- 29 Winds blow because (1)the earth rotates (2)air pressures are unequal (3)the surface is uneven (4)the seasons change 29.....
- 30 A record of changes in atmospheric pressure is kept by (1)an aneroid barometer (2)a mercurial barometer (3)a barograph (4)a hygrograph 30.....
- 31 Lines joining places having the same elevation above sea level are called (1)contours (2)divides (3)isobars (4)isotherms 31.....
- 32 An atmospheric pressure of 29.92 inches may be recorded on a weather map as (1)998.6 (2)1007.2 (3)1013.2 (4)1020.0 millibars. 32.....
- 33 North of the equator the trade winds blow from the (1)northeast (2)north (3)southwest (4>northwest 33.....
- 34 Wind velocity is measured at weather bureau stations by the instrument called the (1)anemometer (2)barometer (3)ceiling balloon (4>wind vane 34.....
- 35 The earth is nearest the sun during our season of (1)spring (2)summer (3)autumn (4>winter 35.....
- 36 Underground streams are common in regions in which the underlying rock is (1)granite (2)limestone (3)sandstone (4)slate 36.....
- 37 The name of a light, spongy volcanic rock is (1)basalt (2)coquina (3)granite (4)pumice 37.....
- 38 No place on the earth has a longitude of more than (1)0° (2)60° (3)90° (4)180° 38.....
- 39 Certain soils are red in color because they contain a high percentage of (1)gabbro (2)gypsum (3)hematite (4)lignite 39.....

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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. [11]

- 40 If the earth's axis were inclined more than  $23\frac{1}{2}^{\circ}$ , the winters in New York State would be *colder*. 40.....
- 41 The most abundant element in the earth's crust is *nitrogen*. 41.....
- 42 The color of a rock is changed by *mechanical* weathering. 42.....
- 43 Mesas and buttes remain standing above the level of the surrounding land when a *mountain* is eroded. 43.....
- 44 A coastal plain is formed by the uplift of the *continental shelf*. 44.....
- 45 Earthquakes occur most often in *old* mountain regions. 45.....
- 46 A permanent well must be dug below the *dry weather* water table. 46.....
- 47 There are many bays and inlets along a coastline of *submergence*. 47.....
- 48 The fraction  $\frac{1}{62,500}$  on a contour map indicates that one inch on the map corresponds to an approximate distance of *one foot*. 48.....
- 49 If the time at the 105th meridian West is 8 a. m. it is *5 a. m.* at the 60th meridian West. 49.....
- 50 If the latitude of a place is 43 degrees North, the North Star will have an altitude of *47 degrees* above the horizon at that place. 50.....

Part II

Answer five questions from part II.

- 1 The rocks of the earth's crust can be divided into three groups: igneous, sedimentary and metamorphic.
- a Explain briefly how *each* group is formed. [3]
  - b To which of these groups does granite belong? [1]
  - c Name *two* minerals *always* found in granite. [2]
  - d Describe the test you would use to determine which of a group of rock samples contain the mineral calcite. [2]
  - e Describe *two* different ways in which rocks of the earth's crust are broken up by weathering. [2]
- 2 The greatest factor influencing safe flying is weather.
- a Describe a method by which weather observers determine ceiling. [2]
  - b Explain why wind velocity in the upper air is usually greater than at the surface. [2]
  - c Why do airplane pilots avoid cumuliform clouds? [2]
  - d Why is icing on airplanes rarely encountered in the stratosphere? [2]
  - e Why do many airplane accidents occur on the leeward side of mountains? [2]
- 3 Explain how *five* of the following physiographic features are formed: (a) flood plains, (b) dome mountains, (c) volcanic cones, (d) hanging valleys, (e) cirques, (f) offshore bars, (g) sinkholes. [10]

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- 4 *a* Explain why the sun, moon and stars seem to move from east to west across the sky. [2]  
*b* Explain why the constellations we see in summer are not the same ones we see in winter. [2]  
*c* Make labeled diagrams showing the relative positions of the earth, moon and sun at the time of (1) a solar eclipse, (2) a lunar eclipse. [2]  
*d* At what phase of the moon does (1) a solar eclipse occur, (2) a lunar eclipse occur? [2]  
*e* Explain why we always see the same side of the moon. [2]
- 5 *a* Describe *two* ways in which top soil may be destroyed by natural processes. [2]  
*b* Discuss how *three* of the following decrease the rate of soil erosion: (1) contour plowing, (2) terracing, (3) dams at headwaters of streams, (4) reforestation. [6]  
*c* Distinguish between transported soil and residual soil. [2]
- 6 Explain *five* of the following: [10]  
*a* A place on the coast has a smaller seasonal change in temperature than a place in the same latitude but located in the interior of the continent.  
*b* There is more rainfall on the windward side of mountains than on the leeward side.  
*c* The wind and pressure belts migrate northward during our spring.  
*d* Higher tides occur at full moon phase than at first quarter phase.  
*e* Dew or frost is more likely to occur on a clear night.  
*f* Thermals are more frequent in the afternoon than at any other time.
- 7 All weather is associated either with a particular air mass or with a front that separates two or more air masses.  
*a* Define the term *air mass*. [2]  
*b* Air masses are referred to as *cold* (*k*) or *warm* (*w*). Explain briefly what this means. [2]  
*c* Mention an air mass that affects the weather of New York State and locate its source region. [2]  
*d* Explain why clouds and precipitation occur along or near fronts. [2]  
*e* Under what condition does an occluded front form? [2]
- 8 *a* What contour interval is used on this map? [1]  
*b* What is the distance between points *A* and *H*, to the nearest tenth of a mile? [1]  
*c* Compare the altitudes of points *B* and *H*. [1]  
*d* Is either of points *A* or *G* visible from *H* or are both visible? Explain your answer. [2]  
*e* What feature is likely to form between *C* and *K*? [1]  
*f* Complete the 1300-foot contour that ends near *A*, and also the incomplete contour next to it. [2]  
*g* Would sand bars be more likely to form in the river near *D* or near *E*? State a reason for your answer. [2]

