

Name _____

Date _____

Period _____

Midterm 2010 (topics 1 - 7)

Multiple choice (2.5 points each) Free Response - 2 pts each

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27 _____

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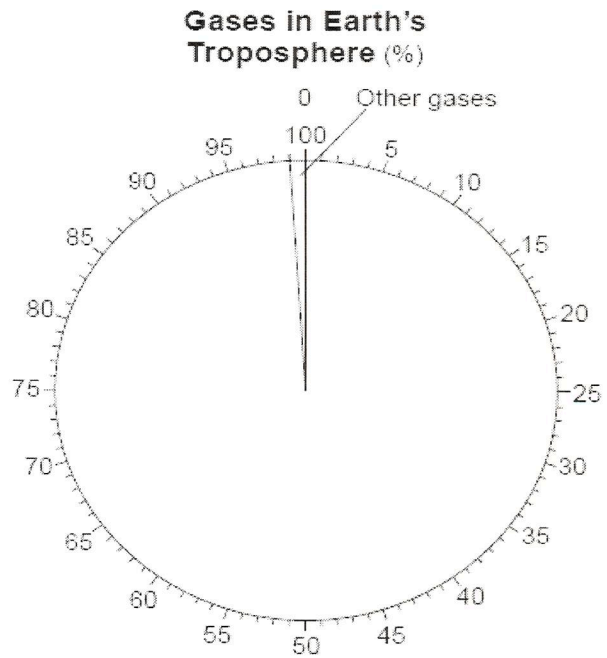
29

12 _____

13 _____

14 _____

15 _____



77	75	73	71	68	65	63
78	78	77	73	69	65	62
82	80	78	74	70	68	65
81	80	77	75	70	67	64
79	77	76	73	68	66	62
75	75	72	69	65	63	61

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38 Highest air-pressure station: _____

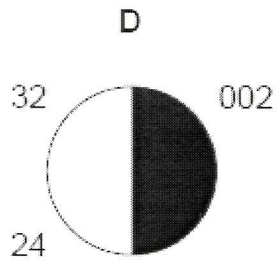


Lowest air-pressure station: _____

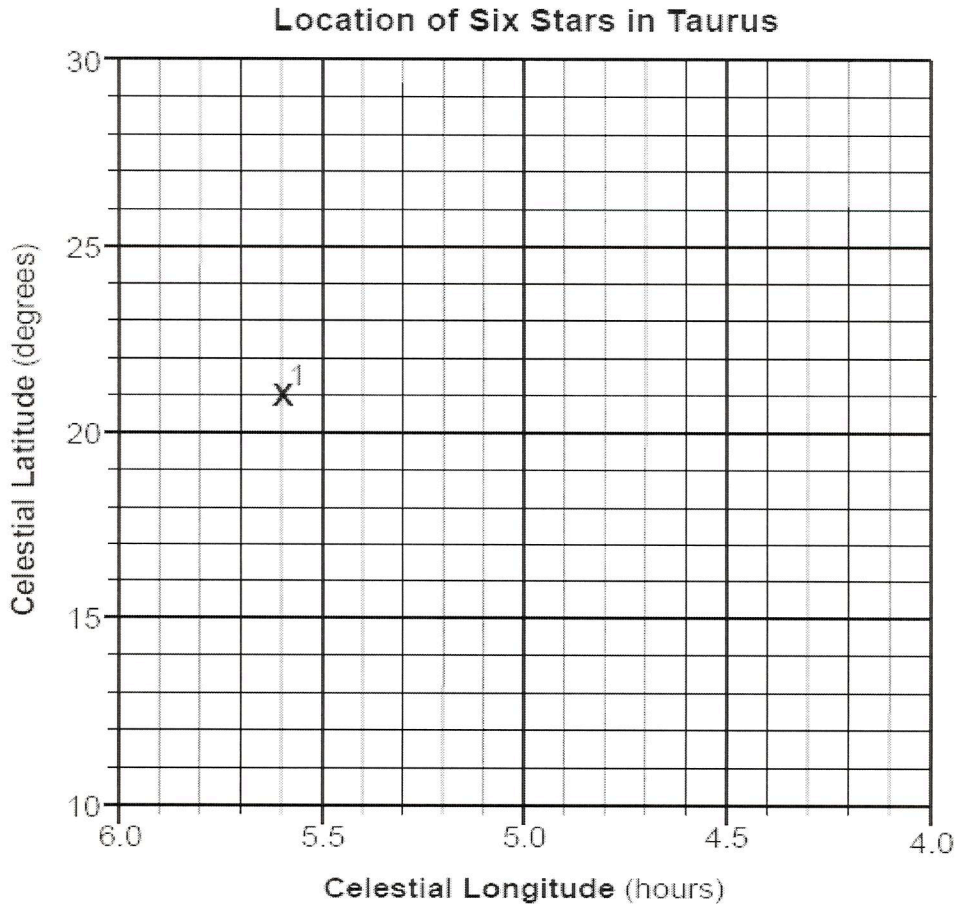
39 _____ °C

40

41



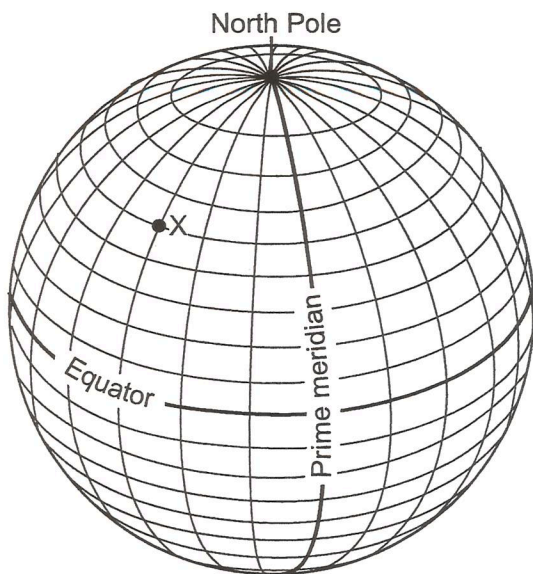
42



43

Stars	Temperature (K)	Luminosity (relative to the Sun)	Classification
<i>Aldebaran</i>		300	giant
<i>Elnath</i>	13,700	700	

- 1 The diagram below shows latitude measurements every 10 degrees and longitude measurements every 15 degrees.



What is the latitude and longitude of point X?

- (1) 40° S 45° E (3) 60° S 30° W
 (2) 50° N 45° W (4) 75° N 30° E

- 2 In which sequence are the items listed from least total mass to greatest total mass?

- (1) solar system, Milky Way, universe
 (2) Milky Way, solar system, universe
 (3) universe, Milky Way, solar system
 (4) Milky Way, universe, solar system

- 3 The red shift of visible light waves that is observed by astronomers on Earth is used to determine the

- (1) sizes of nearby galaxies
 (2) relative motions of distant galaxies
 (3) densities of the planets
 (4) rotation periods of the planets

- 4) An air mass classified as cT usually forms over which type of Earth surface?

- (1) cool water (3) warm water
 (2) cool land (4) warm land

- 5) What is the dewpoint when the dry-bulb temperature is 24°C and the wet-bulb temperature is 21°C?

- (1) 16°C (3) 20°C
 (2) 18°C (4) 21°C

- 6) During which process does water gain the most heat energy?

- (1) condensation (3) evaporation
 (2) freezing (4) melting

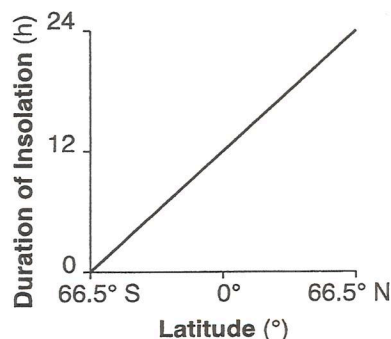
- 7) The Foucault pendulum provides evidence of Earth's

- (1) revolution around the Sun in a geocentric solar system
 (2) revolution around the Sun in a heliocentric solar system
 (3) rotation on its axis in a geocentric solar system
 (4) rotation on its axis in a heliocentric solar system

- 8) At which New York State location would an observer measure the highest altitude of *Polaris*?

- (1) New York City (3) Niagara Falls
 (2) Slide Mountain (4) Plattsburgh

- 9) The graph below shows the general relationship between latitude and the duration of insolation on a particular day of the year.



Which date is represented by the graph?

- (1) March 21 (3) September 21
 (2) June 21 (4) December 21

- 10) Which element is most abundant in Earth's crust?

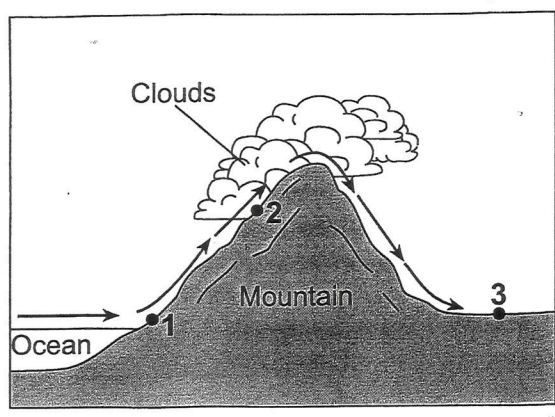
- (1) nitrogen (3) oxygen
 (2) hydrogen (4) silicon

- 11) How many days are required for the Moon to go from one full-Moon phase to the next full-Moon phase when viewed from Earth?

- (1) 24 (3) 29.5
 (2) 27.3 (4) 365

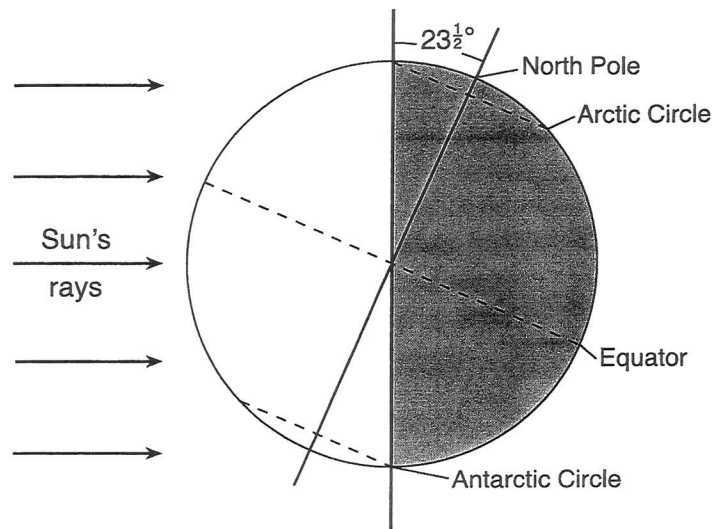
- 12) If the average distance between Earth and the Sun were doubled, what changes would occur in the Sun's gravitational pull on Earth and Earth's period of revolution?

- (1) Gravitational pull would decrease and period of revolution would increase.
 (2) Gravitational pull would decrease and period of revolution would decrease.
 (3) Gravitational pull would increase and period of revolution would increase.
 (4) Gravitational pull would increase and period of revolution would decrease.



- 13) Cloud formation at location 2 is the direct result of air that is rising,
- (1) expanding, and cooling
 - (2) expanding, and warming
 - (3) compressing, and cooling
 - (4) compressing, and warming

14) The diagram below shows Earth as viewed from space.



Which season is beginning in the Northern Hemisphere?

- (1) spring
- (2) summer
- (3) fall
- (4) winter

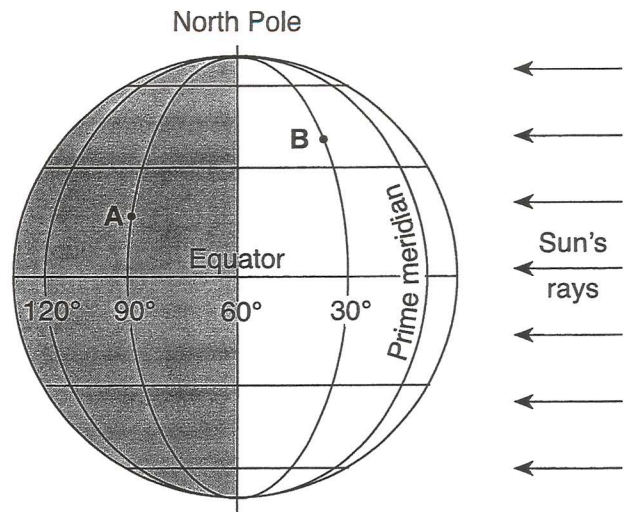
15) The table below shows the latitude and the average yearly temperature for four different cities.

City	Singapore	Calcutta	Washington, D.C.	Moscow
Latitude	1° N	23° N	39° N	56° N
Average Yearly Temperature	81°F	79°F	57°F	39°F

It can be inferred from this table that the cities at higher latitudes have

- (1) lower average yearly temperatures because these cities receive insolation at a higher angle during the year
- (2) lower average yearly temperatures because these cities receive insolation at a lower angle during the year
- (3) higher average yearly temperatures because these cities receive insolation at a higher angle during the year
- (4) higher average yearly temperatures because these cities receive insolation at a lower angle during the year

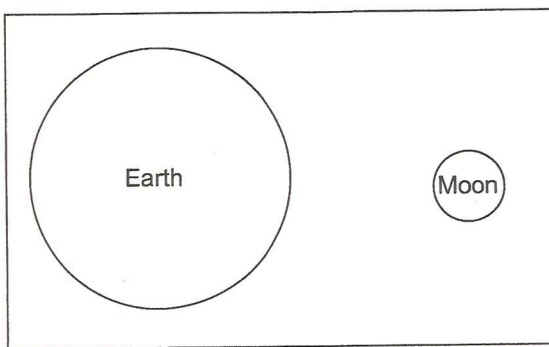
- 16) The diagram below shows the latitude and longitude lines on Earth. Points A and B are locations on Earth's surface.



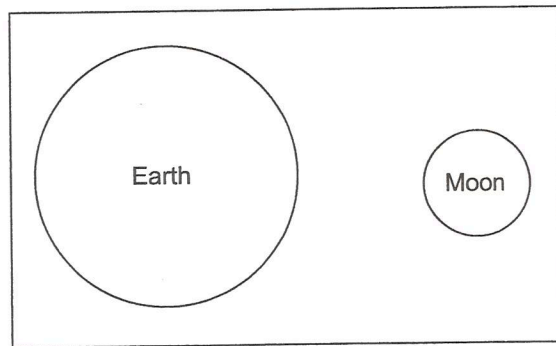
If it is 4 a.m. at location A, what time is it at location B?

- (1) 10 a.m. (3) 6 a.m.
 (2) 2 a.m. (4) 8 a.m.

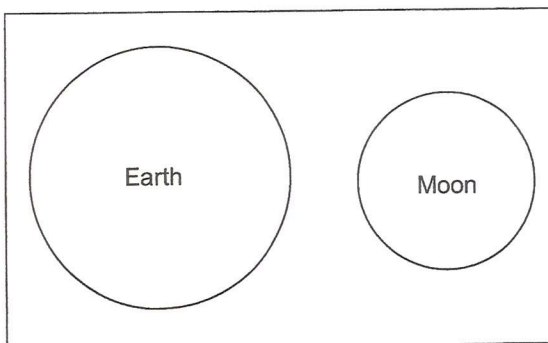
- 17) Which diagram best represents the size of the Moon, compared to Earth, when drawn to scale?



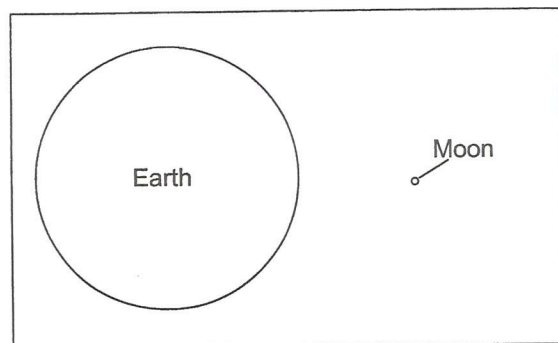
(1)



(3)

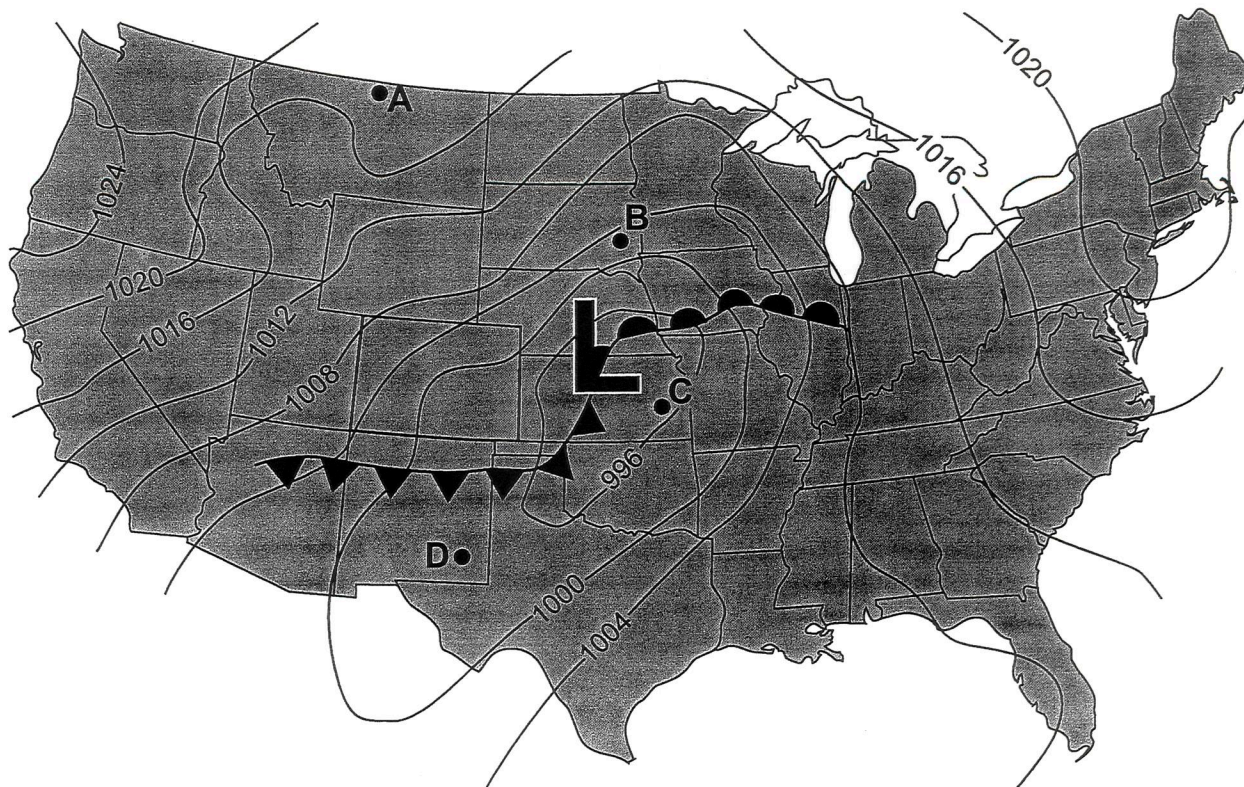


(2)



(4)

Base your answers to questions 18 through 21 on the weather map below, which shows a low-pressure system over the central United States. Isobars are labeled in millibars. Points A, B, C, and D represent locations on Earth's surface.



18) The circulation of surface winds associated with this low-pressure system is

- (1) clockwise and toward the center of the low
- (2) clockwise and away from the center of the low
- (3) counterclockwise and toward the center of the low
- (4) counterclockwise and away from the center of the low

19) The air pressure at the center of this low is

- (1) 991 mb
- (2) 994 mb
- (3) 997 mb
- (4) 1001 mb

20) Which location is most likely experiencing the fastest wind speed?

- (1) A
- (2) B
- (3) C
- (4) D

21) Which map shows the most likely path this low-pressure center will follow during the next 12 hours?



(1)



(2)

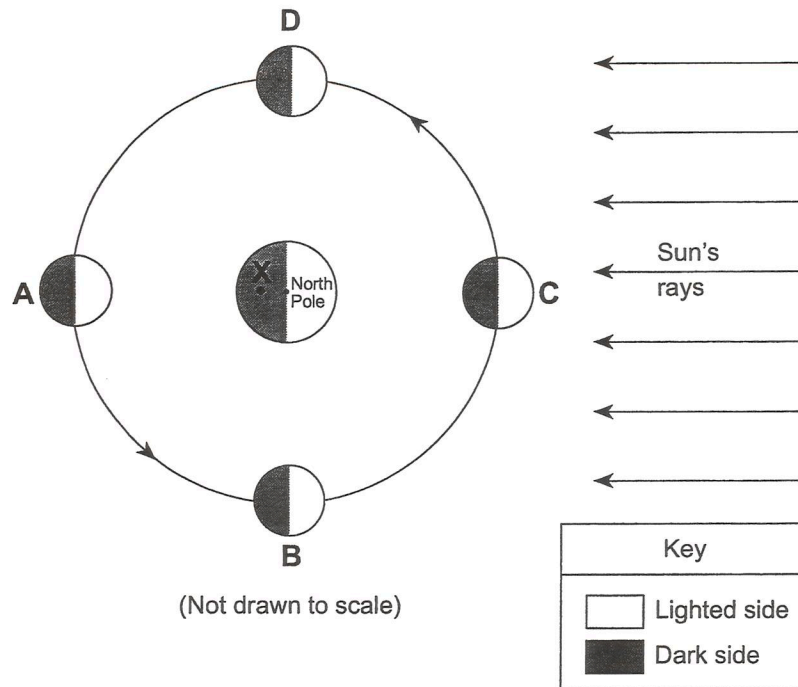


(3)



(4)

Base your answers to question: ~~22~~ through ~~25~~ on the diagram below, which shows Earth and the Moon in relation to the Sun. Positions A, B, C, and D show the Moon at specific locations in its orbit. Point X is a location on Earth's surface.



22) What is the time of day at point X?

- (1) 6 a.m.
- (2) noon
- (3) 6 p.m.
- (4) midnight

23) On what date does the line separating day and night pass through Earth's North Pole, as shown in this diagram?

- (1) December 21
- (2) January 21
- (3) March 21
- (4) June 21

24) A solar eclipse might occur when the Moon is at location

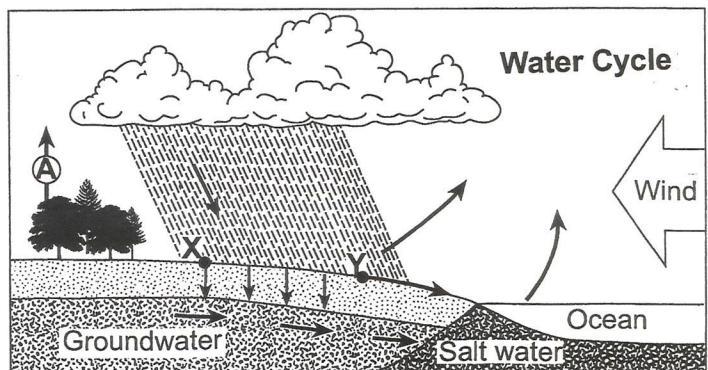
- (1) A
- (2) B
- (3) C
- (4) D

25) Which phase of the Moon would be observed on Earth when the Moon is at location A?



26) Which process in the water cycle is directly responsible for cloud formation?

- (1) condensation
- (2) infiltration
- (3) precipitation
- (4) evaporation



Earth's Early Atmosphere

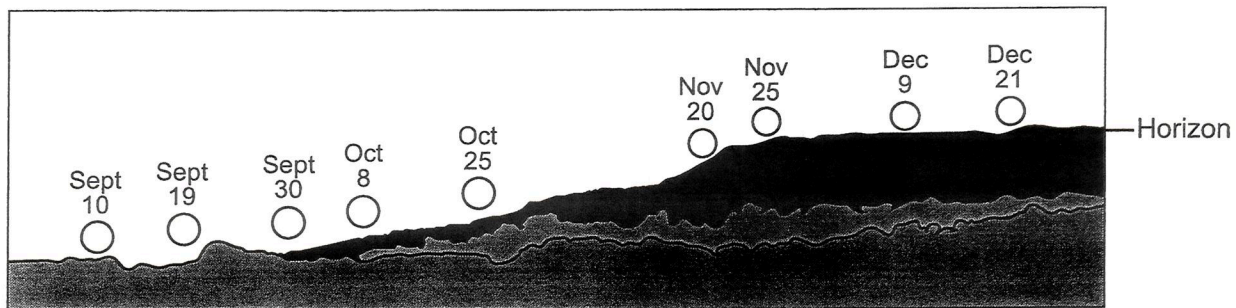
Early in Earth's history, the molten outer layers of Earth released gases to form an early atmosphere. Cooling and solidification of that molten surface formed the early lithosphere approximately 4.4 billion years ago. Around 3.3 billion years ago, photosynthetic organisms appeared on Earth and removed large amounts of carbon dioxide from the atmosphere, which allowed Earth to cool even faster. In addition, they introduced oxygen into Earth's atmosphere, as a by-product of photosynthesis. Much of the first oxygen that was produced reacted with natural Earth elements, such as iron, in the lithosphere and produced new varieties of rocks and minerals. Eventually, photosynthetic organisms produced enough oxygen so that it began to accumulate in Earth's atmosphere. About 450 million years ago, there was enough oxygen in the atmosphere to allow for the development of an ozone layer 30 to 50 kilometers above Earth's surface. This layer was thick enough to protect organisms developing on land from the ultraviolet radiation from the Sun.

- 27) Identify the temperature zone of the atmosphere in which the ozone layer developed. [1]
- 28) Complete the pie graph *in your answer booklet* to show the percent by volume of nitrogen and oxygen gases currently found in Earth's troposphere. Label each section of the graph with the name of the gas. The percentage of other gases is shown. [1]
-

Base your answers to questions 29-30 on the field map in your answer booklet. The field map shows temperatures, in degrees Fahrenheit, taken at several locations on a blacktop parking lot in New York State. The temperatures were recorded at 11:00 a.m. in early June.

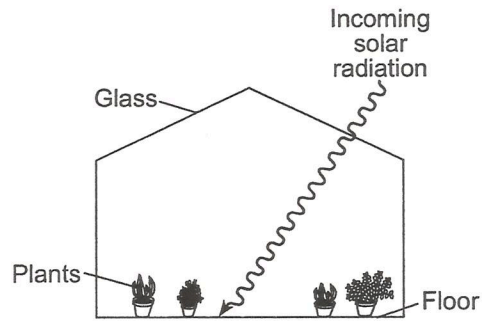
- 29) On the field map *in your answer booklet*, draw the 70°F and 80°F isotherms. The isotherms should be extended to the edges of the map. [1]
- 30) Explain why the surface of this parking lot usually becomes warmer from 11:00 a.m. to 12 noon each day. [1]
-

- 31) The diagram below shows the position of sunrise along the horizon for a period of time from September 10 until December 21, as seen by an observer near Binghamton, New York.



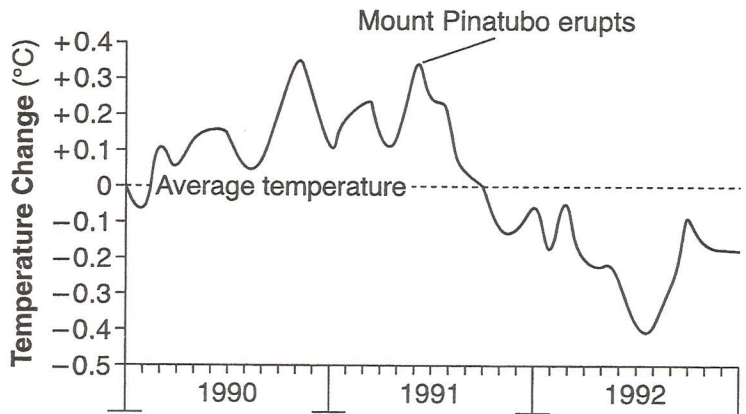
- State *one* reason why the position of sunrise changes during this time period. [1]

Base your answers to questions 32-33 on the diagram below, which shows incoming solar radiation passing through the glass of a greenhouse and then striking the floor.



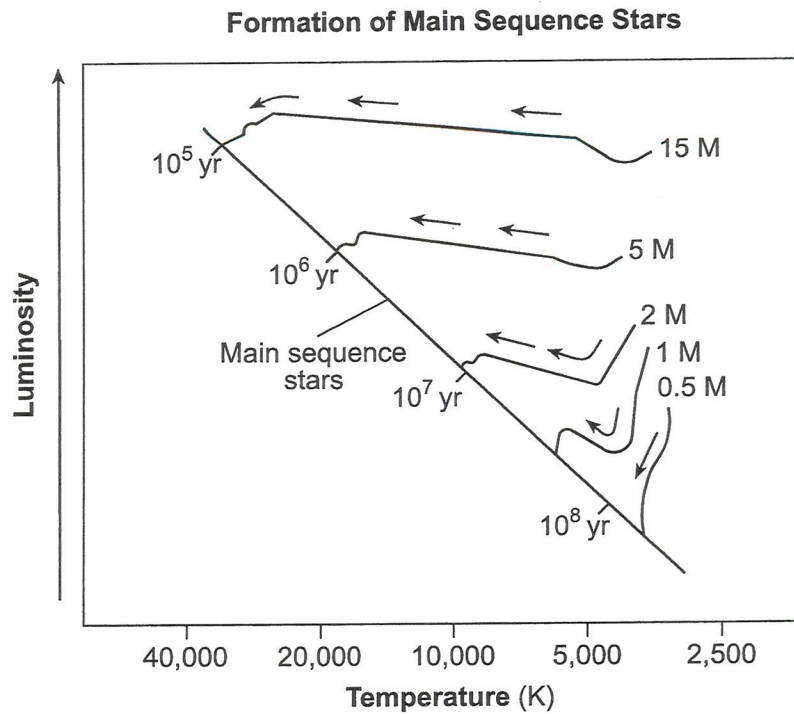
- 32) Some of the incoming solar radiation is absorbed by the floor. Identify the type of electromagnetic energy reradiated by the floor. [1]
- 33) Describe *one* way the glass in the greenhouse acts like the greenhouse gases in Earth's atmosphere. [1]
-

The graph below shows the average changes in monthly global air temperatures from 1990 to 1992. The time of a major volcanic eruption of Mount Pinatubo in the Philippines is shown.



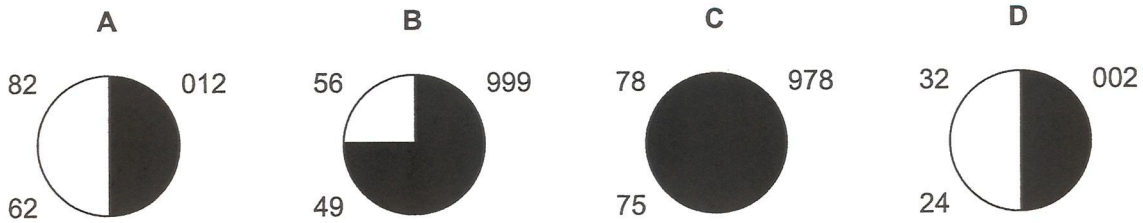
- 34) Explain how this volcanic eruption could have caused the general decrease in temperature shown by the graph. [1]

Base your answers to questions 35-37 on the graph below, which shows the early formation of main sequence stars of different masses (M). The arrows represent temperature and luminosity changes as each star becomes part of the main sequence. The time needed for each star to develop into a main sequence star is shown on the main sequence line.



- 35) Describe the relationship between the original mass of a star and the length of time necessary for it to become a main sequence star. [1]
- 36) Describe the change in luminosity of a star that has an original mass of 0.5 M as it progresses to a main sequence star. [1]
- 37) Identify the force that causes the accumulation of matter that forms the stars. [1]
-

Base your answers to questions 38-41 on the four weather station models, A, B, C, and D, below.



- 38) In your answer booklet, list the letters of the four station models, in order, from the station with the highest air-pressure reading to the station with the lowest air-pressure reading. [1]
- 39) Convert the air temperature at station A into degrees Celsius. [1]
- 40) What evidence indicates that station C has the highest relative humidity? [1]
- 41) On station model D in your answer booklet, draw the proper symbol to indicate a 25-knot wind coming from the west. [1]

Base your answers to questions 42-43 on the data table below, which lists six stars, numbered 1 through 6, found in the constellation Taurus. The table shows the celestial coordinates for these six stars.

Location of Six Stars in Taurus

Star Number	Celestial Longitude (hours)	Celestial Latitude (degrees)	Name
1	5.6	21	Zeta Tauri
2	4.6	16	Aldebaran
3	4.3	15	Gamma Tauri
4	4.5	19	Epsilon Tauri
5	4.7	23	Tau Tauri
6	5.4	29	Elnath

- 42) On the grid in your answer booklet, use an X to plot the position of each of the six stars. Record the number of the plotted star beside each X and connect the Xs in the following order: 1, 2, 3, 4, 5, 6. The first star, Zeta Tauri, has been plotted for you. [1]
- 43) In your answer booklet, complete the data table that provides additional information about two of the stars in Taurus. [1]

